He who planteth an oak tree looks forward to future ages and plants for posterity; nothing can be less selfish than this. In 1895, a little oak scion was planted in Atlanta. Since that time we have been engaged in nurturing it till it has grown to a good husky sturdy tree. This sacred trust was for our posterity and to their care and keeping we commend the future of this National Medical Association.

—Dr. John A. Kenney, 1933

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A lot of things can catch us off guard.

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It is a complication of diabetes that has no warning signs and can lead to blindness.

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The painting was inspired by nature’s constant way of moving and directing our lives. The voice of the painting speaks to the ever-present spiritual connection to human life and the environment that we inhabit. As we go through life, we face many changing winds. We all have to follow a wind direction to find our way!
Characterization of Metabolically Unhealthy Overweight/Obese African American Women: Significance of Insulin-Sensitive and Insulin-Resistant Phenotypes

Trudy R. Gaillard, PhD, RN, CDE; Dara Schuster, MD; Kwame Osei, MD

INTRODUCTION

African Americans have increased cardiovascular morbidity and mortality compared to white Americans.\(^1^4\) The health outcome disparities in African Americans and whites have been attributed to several factors, including genetic, metabolic, and socioeconomic differences. A major comorbid condition in African Americans is obesity. Recent studies have shown that 50% to 60% of African American women are overweight or obese.\(^5^7\) The metabolic consequences of obesity on total health of African American women remain debatable. However, it is well known that obese African American women have higher prevalence of hypertension, type 2 diabetes, stroke, and congestive heart failure than their white counterparts. Other racial/ethnic differences have also been demonstrated in recent metabolic studies in blacks and whites. For example, we\(^6^1^1\) and others\(^1^2^1^5\) have shown that African American women are more insulin-resistant than white women. However, not all obese African Americans are insulin-resistant. Banerji et al found insulin-resistant...
and insulin-sensitive variants in African Americans with type 2 diabetes. No data were provided in the nondiabetic subjects in their study, nor are we aware of similar data in the literature. In other populations of African Ancestry, Jennings et al found that central fat distribution, total adiposity, and physical activity distinguished between insulin-sensitive and insulin-resistant nondiabetic black South African women.

A major determinant of insulin resistance is visceral adiposity. It is well established that visceral adiposity of the abdomen is a powerful predictor or determinant of not only insulin resistance but metabolic syndrome and atherogenic lipids and lipoproteins in several populations. However, in obese African American women, there are only weak relationships among insulin sensitivity, lipids and lipoprotein, and blood pressure. Furthermore, African Americans with identical body mass index (BMI) have lower visceral adiposity than their white counterparts, even though the former manifest greater insulin resistance. Recently, Jennings et al and Crowther et al have also confirmed lower visceral adiposity in South African black women than white South African white women. These studies clearly demonstrated that there are paradoxical and inconsistent relationships among visceral adiposity, insulin sensitivity, body composition, and blood pressure in blacks. Therefore, given the limited economic resources, understanding the clinical and metabolic associates of obesity in African American women who are either at risk or less prone to cardiovascular disease and type 2 diabetes will be important in determining strategies for primary prevention of cardiovascular disease and type 2 diabetes in African American women.

Previous studies have highlighted the heterogeneity of the impact of obesity on cardiovascular disease, metabolic and proinflammatory markers (IL-6, adiponectin, C-reactive protein), and profiles leading to the concepts of metabolically obese but normal-weight, metabolically healthy but obese, and metabolically unhealthy obese subjects in several populations. However, the characteristics of “healthy obese” and unhealthy African American subjects have not been well studied with respect to cardiovascular disease risks. This is extremely important because of the increasing epidemic of obesity in African American women. Furthermore, when metabolic syndrome, defined by Adult Treatment Panel (ATP III) criteria, was used in a cross-sectional study, 19.7% of African Americans, 10.3% of Mexican American women, and 61.4% of white women were classified as metabolically healthy obese subjects. Given the inconsistencies in the relationships between insulin resistance and cardiovascular risk factors in African American women, we believe there is a need for a thorough characterization of the metabolic health status in African American women. Therefore, we sought to define clinical and metabolic characteristics of the metabolically healthy and metabolically unhealthy African American women as defined by quantitative insulin resistant indices.

SUBJECTS, MATERIALS AND METHODS

Study Population

The study consisted of 196 African American women with family histories of type 2 diabetes. Subjects were recruited who were considered to be high risk for developing type 2 diabetes in order to enhance the chances of cardiovascular disease risks. High-risk subjects were defined as individuals who were first-degree family member(s) of African American patients with type 2 diabetes, prior gestational diabetes, and diabetes in remission and controlled by diet alone. Categories of glucose tolerance were classified according to the World Health Organization criteria. The following subjects were excluded: (a) those taking medications known to influence glucose and insulin and lipoprotein metabolism, such as β-blockers, angiotensin-converting enzyme inhibitors, corticosteroids, thiazides, alpha 1 blockers, etc; (b) individuals with liver, heart, lung, and kidney disease; (c) newly diagnosed diabetes patients (approximately 20%); (d) established diabetes patients on antidiabetic and antilipid medications; and (e) individuals who participated in endurance exercises or indulged in regular competitive sports. Females who were established on long-term estrogen replacement therapy over 6 months were accepted into the study. Informed written consent was obtained from each subject after the risks entailed in the study had been thoroughly explained.

Study Protocol

After a 10- to 12-hour overnight fast, the subjects answered a simple questionnaire on physical activity. The activity level was described as: (a) sedentary (no additional physical activity apart from walking and activities of daily living), (b) moderate (tennis, brisk walking, swimming, etc, at least 3 times a week) and (c) strenuous (weight lifting, wrestling, racket ball, marathon, jogging etc at least 3 times a week). Subjects who participated in any endurance or competitive sports were excluded. Questionnaires on sociodemographics, including income and educational attainment, were also completed.
Metabolic Studies
With the subject in the supine position, an intravenous needle (“heparin lock”) was inserted into the forearm vein and kept patent with 0.9% normal saline infusion.

Oral Glucose Tolerance Test
Each subject was instructed to incorporate at least 250 g of glucose into his or her regular meals for 3 days prior to the test. After a 10- to 12-hour overnight fast, subjects ingested 75 g of oral glucose load (Koladex, Baltimore, Maryland) over a 2-minute period. Blood samples were drawn for serum glucose, insulin, c-peptide, lipids and lipoprotein, and glycated hemoglobin (HbA1c) were drawn at baseline (t = 0 min). In addition, blood for serum glucose, insulin, and c-peptide levels was drawn at corresponding times at t = 30, 60, 90, and 120 minutes. Glucose tolerance status of the subjects was defined by the World Health Organization criteria.27

Frequently Sampled Intravenous Glucose Tolerance Test
A subset of persons completed the frequently sampled intravenous glucose tolerance test (FSIGT). With the subject in the supine position, 2 intravenous needles (“heparin lock”) were inserted into the forearm veins and the other to administer the intravenous glucose and exogenous insulin as previously described.28 The test protocol was as follows: 4 blood samples were obtained at t = –20, –10, –5, and 0 mins for basal serum glucose, c-peptide, and insulin concentrations. The average of the 4 samples was taken as the basal level. Thereafter, 0.3 g/kg glucose (50 mL of 50% dextrose water) was infused over a 1-minute period: at t = 19 minutes, intravenous insulin (0.05 U/kg, Humulin, Eli Lilly, Indianapolis, Indiana) dissolved in 30 mL of 0.9% normal saline was infused over 60 seconds. Blood samples were obtained at frequent intervals at t = 2, 3, 4, 5, 6, 8, 10, 12, 16, 19, 22, 24, 25, 27, 30, 40, 60, 70, 90, 120, 140, 150, 160 and 180 minutes for serum glucose, c-peptide, and insulin concentrations. All the samples were centrifuged at 4°C and the sera frozen and stored at –200°C until assayed.

Analytical Methods
Serum glucose concentrations were measured by the glucose oxidase method using glucose autoanalyzer (Beckman Instruments, Fullerton, California). HbA1c was measured by the cation micromolumn chromatographic method (Iso Labs, Akron, Ohio). The normal reference range in our laboratory is 4.5% to 8.0%. The serum insulin and c-peptide levels were determined by a standard double-antibody radioimmunoassay technique at The Core Laboratories of The Ohio State University Hospitals. The sensitivity of the insulin assay was 2.5 uU/mL. The intra-assay and interassay coefficients of variation (CV) were 6% and 10%, respectively. The lower limit of the c-peptide assay was 0.47 ng/mL and the intra-assay and interassay CV were 7% and 13%, respectively. Serum cholesterol, triglycerides, and high-density lipoprotein cholesterol (HDL-C) levels were measured using standard enzymatic methods. Both the intra-assay and interassay CV were 25% and 4%, respectively, for the lipid and lipoprotein levels.

Definition of insulin sensitive (metabolically healthy) and insulin resistant (metabolically unhealthy) obese/overweight African American women. Based on our previous studies and those of others, we defined the insulin-sensitive variant as those with insulin sensitivity greater than $2.7\times10^{-4}\times\text{min}^{-1}\left(\text{uU/mL}\right)^{-1}$. The insulin-resistant data were defined as those with insulin sensitivity less than $2.7\times10^{-4}\times\text{min}^{-1}\left(\text{uU/mL}\right)^{-1}$. These cutoff points correspond to the insulin sensitivity or glucose disposal M of greater than 8 mg/kg/min for insulin sensitivity and less than 8 mg/kg/min, respectively, as determined by euglycemic, hyperinsulinemic clamp method.29

Adult Treatment Panel III criteria for identification of metabolic syndrome. We used the ATP III criteria to define cardiovascular disease risk factors. Therefore, our guidelines for women used in the study had the following components: abdominal obesity (waist circumference, >88 cm), elevated blood pressure level (systolic blood pressure, ≥130 mm Hg or diastolic blood pressure, 85 mm Hg), elevated triglycerides (≥150 mg/dL), HDL-C (<50 mg/dL), and fasting glucose (≥100 mg/dL).29

Calculations and Definitions
Overweight was defined as BMI of 25 to 29.9 kg/m² and obesity as BMI greater than 30 kg/m². Insulin resistance and β cell function were calculated using homeostasis model assessment (HOMA).30 HOMA-IR (insulin resistance) and HOMA-%B (% β cell function) was calculated using the following formula:

$$\text{HOMA-IR} = \frac{\text{fasting insulin (uU/mL)} \times \text{fasting plasma glucose (mmol/mL)}}{22.5}$$

$$\text{HOMA-%B} = 20\times \frac{\text{fasting insulin (uU/mL)}}{\text{fasting glucose (mmol/mL)} - 3.5}$$

Insulin sensitivity was calculated using Bergman’s Minimal Model method (Pasadena, California).28 The low-density lipoprotein cholesterol (LDL-C) concentration was calculated by Friedewald’s equation, ie, LDL-C = total cholesterol - trig/5 - HDL-C. Subjects with triglyceride levels greater than 400 mg/dL were excluded.

Statistical Analysis
All data were analyzed using JUMP statistical software (SAS Institute Inc, 1999). Results were expressed as means ± standard deviation unless otherwise stated. Statistical analyses were performed using Student t test
(paired) for data within the groups and analysis of variance with repeated measures where appropriate. Multiple regression analyses were used to examine the relationship between insulin sensitivity and various cardiovascular risk factors. The nonparametric data were analyzed using \( \chi^2 \). For comparison of the mean data with unequal variance, Newman-Keuls test was used. A probability (\( p \)) value less than .05 was considered statistically significant.

**RESULTS**

The clinical, biochemical, and metabolic characteristics of the subjects are shown in Table 1. The mean age for the group was 42.4 ± 8.4 years. There was a borderline statistically significant difference in age between metabolically healthy and metabolically unhealthy subgroups (39.9 ± 7.4 vs 43.4 ± 8.6 y, \( p = .06 \)). The subjects were generally overweight/obese. The mean BMI was 33.4 ± 8.1 kg/m² for the group. We found statistically significant differences in BMI in metabolically healthy and metabolically unhealthy subgroups (29.7 ± 6.3 vs 35.4 ± 7.3 kg/m², \( p = .001 \)). The mean waist circumference was 98.8 ± 19.9 cm for the group. The mean waist circumference values were 92.6 ± 20.6 cm, and 104.2 ± 16.8 cm (\( p = .0001 \)) for metabolically healthy and metabolically unhealthy subjects, respectively. We found 25.5% of our total population to have metabolic syndrome—30.3% in the metabolically unhealthy and 15.6% in the metabolically healthy.

The mean fasting serum glucose was 83.8 ± 20.4 mg/dL, insulin (13.5 ± 11.1 uU/mL) and c-peptide (2.8 ± 1.3 ng/mL) for the group were all within normal limits. However, there were statistically significant differences between metabolically healthy vs metabolically unhealthy subjects for fasting serum glucose (74.9 ± 10.4 vs 90.2 ± 24.7 mg/dL, \( p = .0001 \)), insulin (9.6 ± 9.7 vs 18.1 ± 11.6 μU/mL, \( p = .0001 \)), and c-peptide (2.2 ± 1.5 vs 3.2 ± 1.2 ng/mL, \( p = .0001 \)) (Table 1).

As described above, we empirically divided the African American women based on the insulin sensitivity index. Insulin sensitivity was defined as those with an index score greater than 2.7, while the insulin-resistant subjects had scores less than 2.7 using Bergman’s minimal model. The mean insulin sensitivity score for our group was 2.3 ± 2.3 × 10⁻⁴ × min⁻¹ (uU/mL⁻¹). The mean insulin sensitivity

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group Mean</th>
<th>Metabolically Healthy</th>
<th>Metabolically Unhealthy</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>196</td>
<td>64</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td><strong>Clinical Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>42.4 ± 8.4</td>
<td>39.9 ± 7.4</td>
<td>43.4 ± 8.6</td>
<td>.06</td>
</tr>
<tr>
<td>Body mass index, kg/m²</td>
<td>33 ± 8.0</td>
<td>29.7 ± 6.3</td>
<td>35.4 ± 7.3</td>
<td>.0001</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>90.5 ± 21.7</td>
<td>82.6 ± 20.0</td>
<td>95.0 ± 19.8</td>
<td>.0001</td>
</tr>
<tr>
<td>Height, cm</td>
<td>165 ± 7.7</td>
<td>162.6 ± 7.2</td>
<td>164.2 ± 8.3</td>
<td>.09</td>
</tr>
<tr>
<td>Waist circumference, cm</td>
<td>98.8 ± 19.9</td>
<td>92.6 ± 20.6</td>
<td>104.2 ± 16.8</td>
<td>.0001</td>
</tr>
<tr>
<td>Hip, cm</td>
<td>111.9 ± 15.5</td>
<td>105.5 ± 15.6</td>
<td>115.0 ± 14.5</td>
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<tr>
<td>Waist to hip ratio, %</td>
<td>0.88 ± 0.12</td>
<td>0.88 ± 0.19</td>
<td>0.90 ± 0.07</td>
<td>.286</td>
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<tr>
<td>Body fat mass, %</td>
<td>42.3 ± 8.0</td>
<td>38.5 ± 7.1</td>
<td>44.8 ± 7.5</td>
<td>.0001</td>
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<tr>
<td>Lean body mass, %</td>
<td>57.6 ± 8.4</td>
<td>61.6 ± 7.3</td>
<td>55.2 ± 7.5</td>
<td>.0001</td>
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<td>Systolic blood pressure, mmHg</td>
<td>123.0 ± 16.7</td>
<td>118.3 ± 13.7</td>
<td>124.3 ± 16.8</td>
<td>.465</td>
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<tr>
<td>Diastolic blood pressure, mmHg</td>
<td>76.3 ± 11.1</td>
<td>74.9 ± 10.3</td>
<td>77.4 ± 11.3</td>
<td>.137</td>
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<tr>
<td>Prevalence of metabolic syndrome, %</td>
<td>25.5</td>
<td>15.6</td>
<td>30.3</td>
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<tr>
<td><strong>Metabolic Parameters</strong></td>
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<tr>
<td>Fasting glucose, mg/dL</td>
<td>83.8 ± 20.4</td>
<td>74.9 ± 10.4</td>
<td>90.2 ± 24.7</td>
<td>.0001</td>
</tr>
<tr>
<td>Insulin, uU/mL</td>
<td>13.5 ± 11.1</td>
<td>9.6 ± 9.7</td>
<td>18.1 ± 11.6</td>
<td>.0001</td>
</tr>
<tr>
<td>C-peptide, ng/mL</td>
<td>2.8 ± 1.3</td>
<td>2.2 ± 1.5</td>
<td>3.2 ± 1.2</td>
<td>.0001</td>
</tr>
<tr>
<td>HOMA-IR</td>
<td>3.0 ± 3.0</td>
<td>1.8 ± 1.8</td>
<td>4.2 ± 3.5</td>
<td>.0001</td>
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<tr>
<td>HOMA-B, %</td>
<td>392.4 ± 515.6</td>
<td>522.2 ± 707.3</td>
<td>407.0 ± 547.6</td>
<td>.212</td>
</tr>
<tr>
<td>Si x 10⁻⁴ x min⁻¹ (uU/mL⁻¹)</td>
<td>2.3 ± 2.3</td>
<td>4.5 ± 2.5</td>
<td>1.4 ± 0.7</td>
<td>.0001</td>
</tr>
<tr>
<td>Sg x 10⁻² x min⁻¹</td>
<td>2.2 ± 1.4</td>
<td>2.8 ± 1.0</td>
<td>1.9 ± 10.0</td>
<td>.0001</td>
</tr>
<tr>
<td><strong>Lipids and Lipoproteins</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol, mg/dL</td>
<td>182.3 ± 35.3</td>
<td>174.6 ± 31.9</td>
<td>185.2 ± 37.1</td>
<td>.05</td>
</tr>
<tr>
<td>High-density lipoprotein cholesterol, mg/dL</td>
<td>50.5 ± 13.3</td>
<td>53.6 ± 13.5</td>
<td>49.2 ± 13.7</td>
<td>.03</td>
</tr>
<tr>
<td>Triglycerides, mg/dL</td>
<td>89.5 ± 55.0</td>
<td>69.9 ± 42.3</td>
<td>104.3 ± 62.5</td>
<td>.0001</td>
</tr>
<tr>
<td>Low-density lipoprotein cholesterol, mg/dL</td>
<td>114 ± 33.2</td>
<td>107.1 ± 33</td>
<td>115.3 ± 34.7</td>
<td>.116</td>
</tr>
</tbody>
</table>

* Values are mean ± SD.
index score was significantly different in the metabolically healthy group when compared to the metabolically unhealthy group (Figure 1). In addition, the corresponding values by HOMA-IR were also significantly different in the metabolically healthy and metabolically unhealthy subjects (1.8 ± 1.8 vs 4.2 ± 3.5, \( p = .0001 \)) (Table 1).

The lipids and lipoproteins in our study did not follow the same trends as the other metabolic parameters (Table 1). The mean fasting serum cholesterol for our study was 182.3 ± 35.3 mg/dL, whereas the mean LDL-C for the group was 114.0 ± 33.2 mg/dL. We found slight differences in metabolically healthy and metabolically unhealthy African American women for serum cholesterol (174.6 ± 31.9 vs 185.2 ± 37.1 mg/dL, \( p = .05 \)) but no differences in LDL-C (107.1 ± 33 vs 115.3 ± 34.7 mg/dL, \( p = .116 \)) despite the obesity in our subjects. The mean fasting serum triglycerides value for our group was 89.5 ± 55.0 mg/dL. We found significant differences between metabolically healthy and metabolically unhealthy subjects for the serum triglycerides (69.9 ± 42.3 vs 104.3 ± 62.5 mg/dL, \( p = .0001 \)). In our study, the mean HDL-C was 50.5 ± 13.3 mg/dL as a group. We found significant differences for HDL-C between metabolically healthy vs metabolically unhealthy groups (53.6 ± 13.5 vs 49.2 ± 13.7 mg/dL, \( p = .03 \)).

The mean systolic blood pressure and diastolic blood pressure for the group was 123.0 ± 16.7 vs 76.3 ± 11.1 mm Hg, respectively. Surprisingly, there was no statistically significant difference between metabolically healthy and metabolically unhealthy groups for systolic blood pressure (118.3 ± 13.7 mm Hg vs 124.3 ± 16.8 mm Hg, \( p = .465 \)) and diastolic blood pressure (74.9 ± 10.3 mm Hg vs 77.4 ± 11.3 mm Hg, \( p = .137 \)).

Using multiple regression analysis, we found that insulin resistance (\( r^2 = 0.4050 \)) correlated with lean body mass (\( p = .02 \)), insulin (\( p = .0001 \)), and waist circumference (\( p = .02 \)) but not with any of the metabolic parameters and blood pressure in our study.

**DISCUSSION**

Obesity has become epidemic globally and has emerged as the major health problem in the 21st century.\(^5\) Combating the epidemic of obesity requires tremendous human and economic resources. The increasing epidemic also calls for understanding of the health consequences and outcomes in different racial and ethnic populations.

We found 33% of our nondiabetic healthy African American women subjects were insulin-sensitive (>2.7) and constituted metabolically healthy, while 67% had insulin resistance (<2.7) and constituted the metabolically unhealthy bases on our empirical definition of insulin sensitivity. Thus, we showed clearly that a significant proportion of obese African Americans are insulin-resistant. This is of interest since insulin resistance is regarded as the underpinning of cardiovascular disease,
hypertension, triglycerides and metabolic syndrome. Thus, theoretically, African American women should have generally higher prevalence of metabolic syndrome than their white counterparts. This is, however, not the case. Indeed, according to NHANES III, the prevalence of metabolic syndrome was 13.9% for African American men and 20.9% for African American women during 1988-1994. The corresponding rates of metabolic syndrome were 25% in white men and 23% white women for the same time period. We should point out that these prevalent rates were lower than those of a recent report from the Jackson Heart Study, which found the overall metabolic syndrome rate of 39.4% (32.7% for men and 43.3% for women). Although the current study was cross-sectional, our study highlights the fact that not all obese/overweight African American women may be prone to developing cardiovascular risks for cardiovascular disease and type 2 diabetes based on conventional risk factors. Indeed, we found the prevalence of metabolic syndrome to be 25.5% in our overall population, with 15.6% in the metabolically healthy and 30.3% in the metabolically unhealthy. This suggests that among obese/overweight African Americans without diabetes, there is a subset that is more insulin-resistant with some of the concomitant cardiovascular disease risk factors as defined by metabolic syndrome.

In the present study, we empirically characterized our obese African American women as insulin-sensitive and insulin-resistant variants or phenotypes whom we believe reflect metabolically healthy and metabolically unhealthy obese/overweight African American women, respectively. We found that the metabolically healthy who were insulin-sensitive had normal glucose, insulin, and blood pressure that were similar to those of healthy normal-weight subjects we have previously published. These parameters were dissimilar when compared to the insulin-resistant, metabolically unhealthy subgroup. Specifically, we found significant differences in age, BMI, percentage of body fat, and waist circumference as well as fasting serum insulin, glucose, and c-peptide in metabolically healthy and metabolically unhealthy in our study.

A major abnormality in obese/overweight subjects includes lipid disorder. Generally, high serum triglycerides and low HDL-C are common in insulin-resistant, obese humans with and without type 2 diabetes than in nondiabetic, insulin-sensitive subjects. We have shown that blacks have greater insulin resistance and hyperinsulinemia when compared to whites. Despite the insulin resistance, blacks also paradoxically have relatively lower serum triglyceride levels when compared to their white counterparts. Recently, Haffner et al showed that in addition to relatively lower serum triglycerides, Africans Americans have also larger LDL-C particle sizes, which are more buoyant and less atherogenic when compared to whites in the Insulin Resistance Atherosclerosis Study. Despite these favorable antiatherogenic lipids and lipoprotein profiles, blacks continue to suffer enormously and disproportionately from cardiovascular disease mortality and morbidity. The reasons are unclear in blacks, but we have attributed this paradox to potential HDL-C dysfunction. In the present study, we found that the metabolically healthy subjects had significantly lower serum triglycerides than the metabolically unhealthy subgroup. Because our subjects were either overweight or obese, we had expected much lower serum HDL-C and higher serum triglyceride levels similar to other ethnic populations. In this regard, we and others have reported a weaker association among insulin resistance, HDL-C, and triglycerides in African Americans. This was confirmed in the present study. Furthermore, Sumner et al and Haffner et al showed that the increasing serum triglycerides are not associated with changes in serum total cholesterol and LDL-C levels in African American women. We should note that the remarkably lower serum triglycerides and higher HDL-C levels have also been reported in insulin resistant, nondiabetic, obese black South African women when compared to white South African women.

Hypertension is more common in African Americans than white Americans and occurs in approximately 40% to 45% and 20% to 25%, respectively. Hypertension is considered a major cause of cardiovascular disease morbidity and morbidity in African Americans. The exact cause of hypertension in African Americans remains uncertain but is suspected to be multifactorial. Recent studies have suggested insulin resistance as the pivotal lesion for hypertension in certain populations, but this remains controversial in African Americans. While hypertension is associated with insulin resistance in Caucasians, it has been difficult to establish such a strong association in African Americans. Therefore, in the present study, we asked the question whether systolic and diastolic blood pressure are independently associated with insulin resistance in the metabolically healthy and metabolically unhealthy subgroups. Surprisingly, we found that both systolic and diastolic blood pressure were not different in the metabolically healthy when compared with the metabolically unhealthy subjects, despite the 2- to 4-fold difference in insulin-sensitivity indices. Using multiple regression analysis, blood pressure did not correlate with insulin sensitivity in our present study. This finding is surprising but extremely important and confirms our previous studies that showed a lack of relationship between insulin sensitivity and blood pressure in African Americans. Thus, in contrast with the whites, there appears to be a dissociation between quantitative insulin resistance and blood pressure in African American women.

Truncal obesity, or increasing waist circumference, is associated with increased cardiovascular disease risks. Hence, the ATP III considers a waist...
circumference greater than 88 cm in women to correlate with increased risk for metabolic syndrome and cardiovascular disease. However, ATP III did not elucidate the importance of ethnicity/race on waist circumference in their studies. In the present study, we found that the mean waist circumference was 98.8 ± 19.9 cm for the entire group, which exceeds the cutoff point of ATP III criteria. We found that the metabolically healthy group had a waist circumference of 92.6 ± 20.6 cm when compared with 104.2 ± 16.8 cm in the metabolically unhealthy group. We should note that waist circumference in our 2 groups exceeded that recommended by ATP III criteria (waist circumference, >88 cm). Nevertheless, waist circumference was significantly lower in metabolically healthy than in the metabolically unhealthy African American women, but the former still exceeded the ATP III cutoff point. Despite the greater waist circumference and BMI in African American women, they have a lower intra-abdominal visceral adiposity as assessed by computed tomography scan or magnetic resonance imaging when compared with white women. Indeed, a similar finding has been reported in black South African women. 

The present study has several strengths. We recruited nondiabetic overweight/obese African American women who had a family history of type 2 diabetes and therefore were at greater risk of cardiovascular disease and type 2 diabetes. Hence, our study subjects could be candidates for primary prevention of cardiovascular disease and type 2 diabetes. We characterized the subgroups based on established measures of quantitative insulin sensitive or insulin resistance. First, we used FSIGT with estimation of insulin sensitivity, which has been validated by the euglycemic hyperinsulinemic clamp. The metabolically healthy subjects had 2- to 3-fold higher mean insulin sensitivity than the metabolically unhealthy African American women. In addition, we calculated HOMA-IR using homeostasis model assessment. This has also been validated by the euglycemic hyperinsulinemic clamp method. We found the insulin resistant indices by HOMA-IR were also 2- to 3-fold lower in the metabolically healthy than the metabolically unhealthy subjects.

To the best of our knowledge, this is the largest number of nondiabetic African American women who have undergone quantitative measurement of insulin sensitivity using FSIGT and HOMA-IR. Thus, our study highlights the heterogeneity of insulin-sensitivity indices in obese/overweight African American women.

We also recognize some limitations in our study. First, our study was cross-sectional in a small number of African American women. Hence, we cannot determine or infer cause-and-effect relationships between insulin-resistant indices and the metabolic parameters. Second, we did not examine physical fitness (by measuring VO2 max) and nutritional data, which significantly impact cardiovascular disease risks in our study. Finally, we examined only women but not men. Hence, our data cannot be extrapolated to African American men, similar to the studies by Sumner et al., Lovejoy et al., and Albu et al. In this regard, we previously reported that African American women had more cardiovascular disease risk factors when compared to their African American men counterparts matched for waist to hip ratio and BMI. Furthermore, NHANES III and The Jackson Heart Study found higher prevalence rates of metabolic syndrome in African American women than their male counterparts. These investigators did not measure insulin-sensitivity indices in their study.

In summary, we describe a very unique subset of obese and overweight African American women who seem to be protected against obesity-related cardiovascular risk factors. We found that at least 33% of our nondiabetic African American women with family history of type 2 diabetes can be described as metabolically healthy subjects. Indeed, these metabolically healthy subjects had metabolic parameters that were similar to those of nonobese, healthy African American women. The metabolically healthy subjects who we have termed metabolically healthy, overweight/obese African American women had normal lipids and lipoproteins when compared to the insulin-resistant, metabolically unhealthy counterparts. Most importantly and unexpectedly, blood pressure was indistinguishable in the metabolically healthy and metabolically unhealthy nondiabetic African American women. Also we found that in the metabolically unhealthy women, the perturbations in HDL-C and triglycerides were very minimal despite the severe insulin resistance. Whether the metabolically healthy are protected or not against type 2 diabetes and cardiovascular disease remains to be investigated in longitudinal studies in African American women.

ACKNOWLEDGMENTS

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REFERENCES


Association of Hypertension and Bone Mineral Density in an Elderly African American Female Population

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INTRODUCTION

Hypertension is a major cardiovascular risk factor that, in the long run, can lead to acute coronary syndrome, congestive cardiac failure, stroke, chronic renal failure, hypertensive retinopathy,
vascular dementia, metabolic syndrome, and aneurysm in elderly populations. Similarly, low bone mineral density (BMD) leading to osteopenia or osteoporosis is one of the most common causes of disability and advanced mortality in elderly populations, with the most pronounced adverse medical and economic consequences. Low BMD is the single best predictor of fracture risk in asymptomatic postmenopausal women. Low BMD takes its greatest toll among persons aged 65 years of age or older, a group that in the United States incurs more than 200,000 hip fractures annually, resulting in direct medical care costs of approximately $6 billion. Both of these diseases exhibit a similar behavior; both diseases have a genetic base and a polygenic heredity pattern influenced by various nongenetic factors. On the other hand, 50% of the hypertensive female population is postmenopausal women, and both diseases therefore coexist. The size of the population aged 65 years or older will increase markedly during the next few decades, driven by the aging of the baby boomers and by increasing longevity. Owing to the high prevalence of hypertension and low BMD in elderly populations, preventive measures against either one as well as defining associations between them is an emerging area of interest.

Pathophysiologically, hypertension can lead to renal changes that can cause hypercalciurea and, ultimately, low BMD, but real-world clinical scenarios may be divergent from theoretical views. Certain studies have addressed an inverse association of high blood pressure on BMD, while others have reported a lack of association between these variables. Despite all of these available data, results have been inconsistent and inconclusive. Various hypertension-related abnormalities have been hypothesized to affect BMD through discrete mechanisms such as increased metabolism of the calcium from the bone, secondary activation of the parathyroid glands, and increased calcium loss from the kidneys. Hypercalciuria is the change most commonly found in hypertensive women. It is inversely related to bone mass and is more marked in osteoporotic hypertensive women. However, no definite causal mechanisms are identified to support this association between hypertension and BMD specifically in the African American population.

Furthermore, one of the most commonly prescribed antihypertensive medications, thiazide diuretic, has been postulated to increase renal recovery of calcium with resultant improvement in BMD. In addition to the their antihypertensive actions, thiazides increase BMD and reduce the prevalence of fractures, indicating that thiazides may have a role in the management of postmenopausal osteoporosis. Traditionally, the bone-protective effects of thiazides have been attributed to an increase in renal calcium reabsorption, secondary to the inhibition of the sodium chloride cotransporter, NCC, expressed in the kidney distal tubule. Whether thiazides exert a direct osteoanabolic effect independently of their renal action is controversial. Cross-sectional studies have shown that users of thiazide diuretics have slightly higher cortical and trabecular bone mass than nonusers. Two randomized clinical studies of the effect of thiazide diuretics on bone loss had conflicting results. Thiazide diuretics are known to reduce urinary excretion of calcium and may also decrease bone resorption and bone turnover.

Owing to diverse variations in results of earlier published studies demonstrating either no correlation or an inverse correlation between BMD and hypertension, the perplexity of association between these 2 conditions remains unknown. Given these discrepancies, we attempted to investigate this association between low BMD and high blood pressure specifically in elderly African American females. Our primary endpoint was to investigate the association between low BMD and high blood pressure in elderly African American females without comorbid conditions that affect BMD. The secondary endpoint was to determine the effect of thiazide diuretics on the BMD of hypertensive elderly African American females. The study was done in this ethnic group because no comprehensive data are available in African American population. We included both lumbar and femoral regions in our study for determination of BMD. This study is the largest of its kind in this specific age group and ethnicity, with appropriate adjustment for confounding risk factors.

**METHODS AND PROCEDURES**

**Study Design**

The study was a retrospective, cross-sectional analysis of the elderly African American female population. The St Luke’s Roosevelt Hospital Center Institutional Review Board (IRB) approved the study.

**Participant Selection**

The study population consisted of 965 African American females of aged 65 years or greater who were referred for clinical evaluation of BMD. Medical charts were reviewed after obtaining IRB approval, and data pertaining to height, weight, BMI, age, ethnicity, gender, hypertension, and antihypertensive medications for the period of January 1998–July 2008 were collected. After screening based on ethnicity, ie, African American female population, 631 patients were found to have hypertension (diagnosed hypertension and use of antihypertensive medications) and 334 patients without hypertension. Exclusion criteria included patients with bilateral oophorectomy, or use of steroids, bisphophonates, hormone replacement therapy, proglitazones, or loop diuretics.

**Definitions and Outcome Measures**

The absolute amount of bone as measured by BMD testing generally correlates with bone strength and its
ability to bear weight and is used to diagnose osteopenia and osteoporosis. The BMD is measured with a dual-energy x-ray absorptiometry test (DXA). By measuring BMD, it is possible to predict fracture risk in the same manner that measuring blood pressure can help predict the risk of coronary artery disease. BMD at the lumbar spine L1-L4 and both femoral necks was measured on a Lunar Prodigy densitometer. DXA scans were performed according to the manufacturer’s specifications. Quality control included daily QC phantom scanning. Osteopenia was defined as females with a T score of −1.1 or less, while osteoporosis was defined as the T score of −2.5 or less when compared to young adults without osteopenia or osteoporosis, according to World Health Organization criteria of classification.

Hypertension was defined as: (1) previous hypertension diagnosis, (2) blood pressure greater than or equal to 140 mm Hg systolic or 90 mm Hg diastolic on at least 2 occasions, or (3) use of antihypertensive pharmacological therapy. Active smoking was defined as smoking within previous month. In our study, there were only a few subjects who were active smokers (23 hypertensive and 9 subjects without hypertension).

Ethnicity was determined by self-reporting according to the following criteria: all parents and 4 grandparents were required to be of the African American origin. A subanalysis was carried out for hypertensive patients taking thiazide diuretics.

**STATISTICAL ANALYSIS**

Odds ratios (ORs) and 95% confidence intervals (CIs) for the associations between explanatory variables and a history of hypertension were estimated using multivariable logistic regression models. P values below .05 were considered to be statistically significant. Estimates for the association between the primary explanatory variable of interest (BMD) and a history of hypertension were adjusted in multivariate models that included potential confounding covariates that were statistically significant in univariate analysis or which were significant components of the confounding pathway. Statistical analysis was performed using STATA version 10 software package (College Station, Texas).

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**Table 1. Baseline Characteristics of Participants (N = 965)**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Participants Without a History of Hypertension (N = 334)</th>
<th>Participants With a History of Hypertension (N = 631)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD)</td>
<td>77 (41)</td>
<td>74 (7)</td>
<td>.1292</td>
</tr>
<tr>
<td>With normal bone mineral density</td>
<td>105 (31)</td>
<td>204 (32)</td>
<td>.948</td>
</tr>
<tr>
<td>With osteopenia</td>
<td>166 (50)</td>
<td>313 (50)</td>
<td></td>
</tr>
<tr>
<td>With osteoporosis</td>
<td>62 (19)</td>
<td>113 (18)</td>
<td></td>
</tr>
<tr>
<td>With a history of diabetes mellitus</td>
<td>42 (12)</td>
<td>163 (26)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>With a history of corticosteroid use</td>
<td>4 (1)</td>
<td>14 (2)</td>
<td>.262</td>
</tr>
<tr>
<td>With a history of smoking</td>
<td>12 (4)</td>
<td>23 (4)</td>
<td>.960</td>
</tr>
</tbody>
</table>

**Table 2. Bone Mineral Density Measurements of Participants at Various Sites**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Participants Without a History of Hypertension (N = 334)</th>
<th>Participants With a History of Hypertension (N = 631)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal bone mineral density, g/cm²</td>
<td>1.19 (0.22)</td>
<td>1.14 (0.22)</td>
<td>.08</td>
</tr>
<tr>
<td>Osteopenia</td>
<td>0.87 (0.16)</td>
<td>0.88 (0.15)</td>
<td>.53</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>0.86 (0.15)</td>
<td>0.87 (0.14)</td>
<td>.18</td>
</tr>
<tr>
<td>Bone mineral density, g/cm²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At lumbar spine (L1-L4)</td>
<td>−0.51 (1.81)</td>
<td>−0.28 (1.84)</td>
<td>.07</td>
</tr>
<tr>
<td>At right femoral neck</td>
<td>−1.19 (1.18)</td>
<td>−1.08 (1.14)</td>
<td>.19</td>
</tr>
<tr>
<td>At left femoral neck</td>
<td>−0.83 (1.26)</td>
<td>−0.69 (1.26)</td>
<td>.12</td>
</tr>
<tr>
<td>T score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At lumbar spine (L1-L4)</td>
<td>0.32 (1.65)</td>
<td>0.45 (0.32)</td>
<td>.26</td>
</tr>
<tr>
<td>At right femoral neck</td>
<td>−1.19 (1.18)</td>
<td>−1.08 (1.14)</td>
<td>.1902</td>
</tr>
<tr>
<td>At left femoral neck</td>
<td>−0.26 (1.09)</td>
<td>−0.24 (1.10)</td>
<td>.79</td>
</tr>
</tbody>
</table>
RESULTS

Baseline characteristics of the participants are shown in Table 1. A total of 631 the participants (65.3%) had a history of hypertension and 334 (34.7%) did not. The proportion of diabetes mellitus in participants with hypertension was greater than 2 times as compared to those without hypertension (26% vs 12%; \( p < .001 \)). There were no other significant differences in baseline characteristics between the 2 groups.

With regards to BMD, there were no significant differences between the BMD at various sites for hypertensive and nonhypertensive participants (Table 2 and Figure A). The proportion of patients with osteopenia and osteoporosis was also similar between the 2 groups (Table 2). The calculated \( T \) and \( Z \) scores at 3 different proximal sites (lumbar spine, left and right femoral necks) were also not significantly different in hypertensive and nonhypertensive participants (Table 2 and Figures B and C).

When BMD was analyzed as a categorical variable with osteopenia and osteoporosis being the major explanatory variables of interest (Table 3), there were no increased odds for a history of hypertension with osteopenia or osteoporosis. This association was similar in both univariate and multivariate analysis. The strongest predictor for hypertensive was a history of diabetes mellitus (OR, 2.43; 95% CI, 1.68-3.52; \( p < .01 \)).

When a subanalysis was performed of hypertensive participants taking thiazide diuretics vs those who were not, no significant differences were found in the BMD, \( T \) score, or \( Z \) score at any site. (Tables 4 and 5).

DISCUSSION

Both osteoporosis and hypertension are “common diseases” in the elderly African American population, and it is worthwhile to explore the relationship between these 2 diseases. Our study is unique as it evaluated the relationship between BMD and hypertension in the elderly African American female population. The results of the present study demonstrate that BMD, \( T \) score, and \( Z \) score at the lumbar spine (L1-L4), right femoral neck, and left femoral neck were not significantly different in the hypertensive group as compared to normotensive controls when confounding factors affecting BMD were taken into account. The results of our study were corroborated by the results of a few earlier studies emphasizing that there is no association between both of these variables in various other ethnicities, but conflict with certain studies showing an inverse association of hypertension and BMD. Furthermore, our results demonstrate the absence of any protective effect of thiazide diuretics on the BMD in the hypertensive elderly African American female population.

Previous studies on the association of BMD and hypertension were limited by either a small sample size, lack of simultaneous measurement of BMD at the femur and spine, or lack of adjustment for other confounding factors. In the light of these limitations, results of our study suggest that no causal relationship between BMD and hypertension exists, when generalization of BMD determining sites and confounding factors are taken into account.

Recent studies in elderly postmenopausal hypertensive women have shown that ghrelin, a peptide secreted by the stomach, may produce a protective effect on bone...
mass through an anticatabolic mechanism manifested by a decrease of bone resorption.\textsuperscript{20} This probably could be an important factor that might counteract the increased urinary calcium excretion and increased level of parathyroid hormone (PTH) in the body as shown in other studies.\textsuperscript{20} Also, the elevated level of PTH in the long run may have a negative feedback effect on calcium homeostasis, which may ultimately lead to stabilization of BMD in hypertensive subjects, further neutralizing the negativity between these 2 diseases.

The noteworthy points of our study include adequate power of the sample population, as most of the previous studies have small sample sizes.\textsuperscript{10,12-14} We chose both the sites (lumbar spine and femoral necks) for the study, as many studies were done at only 1 site.\textsuperscript{16,17,19} The study was restricted to African American women to eliminate ethnicity and gender as cofounding variables. Our subjects were all postmenopausal and ambulatory, eliminating masking variables such as estrogen and immobilization.\textsuperscript{26-28} We selected an elderly population because age itself is an important factor affecting BMD.\textsuperscript{29}

As previously stated, use of thiazide diuretics has been previously shown to be associated with a reduced risk for hip fractures, with risk ratios\textsuperscript{30-32} ranging from 0.3 to 0.8. However, all of these studies have been observational, which allows the possibility that users of thiazide diuretics have a lower risk of hip fracture because of other confounding factors not solely due to changes in bone mass.\textsuperscript{33} In addition, data of Heidrich et al conflict with previously published results and found a crude OR

### Table 3. Univariate and Multivariate Analysis for Odds of Hypertension

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Unadjusted Odds Ratio (95% Confidence Interval)</th>
<th>P</th>
<th>Adjusted Odds Ratio (95% Confidence Interval)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteopenia</td>
<td>0.97 (0.72-1.31)</td>
<td>.846</td>
<td>1.03 (0.76-1.40)</td>
<td>.837</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>0.94 (0.64-1.38)</td>
<td>.748</td>
<td>0.98 (0.66-1.46)</td>
<td>.931</td>
</tr>
<tr>
<td>History of diabetes mellitus</td>
<td>2.43 (1.68-3.52)</td>
<td>&lt;.001</td>
<td>2.51 (1.72-3.64)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>History of smoking</td>
<td>1.02 (0.50-2.07)</td>
<td>.960</td>
<td>0.90 (0.43-1.85)</td>
<td>.766</td>
</tr>
<tr>
<td>History of corticosteroid use</td>
<td>1.88 (0.61-5.75)</td>
<td>.270</td>
<td>2.00 (0.64-6.20)</td>
<td>.230</td>
</tr>
</tbody>
</table>

### Table 4. Baseline Characteristics of Hypertensive Participants With and Without a History of Thiazide Diuretic Use (N = 630)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Hypertensive Participants Without a History of Thiazide Use (N = 458)</th>
<th>Hypertensive Participants With a History of Thiazide Use (N = 173)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD)</td>
<td>75 (6.71)</td>
<td>74 (6.75)</td>
<td>.306</td>
</tr>
<tr>
<td>With normal bone mineral density</td>
<td>144 (31.4)</td>
<td>60 (34.7)</td>
<td>.702</td>
</tr>
<tr>
<td>With osteopenia</td>
<td>230 (50.2)</td>
<td>83 (50)</td>
<td></td>
</tr>
<tr>
<td>With osteoporosis</td>
<td>84 (18.4)</td>
<td>30 (17.3)</td>
<td></td>
</tr>
<tr>
<td>With a history of diabetes mellitus</td>
<td>127 (27.7)</td>
<td>36 (20.8)</td>
<td>.070</td>
</tr>
<tr>
<td>With a history of corticosteroid use</td>
<td>8 (1.7)</td>
<td>6 (3.5)</td>
<td>.190</td>
</tr>
<tr>
<td>With a history of smoking</td>
<td>18 (3.9)</td>
<td>5 (2.9)</td>
<td>.534</td>
</tr>
</tbody>
</table>

### Table 5. Bone Mineral Density Measurements of Hypertensive Participants With and Without Thiazide Use

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Participants Without Thiazide Diuretic Use (N = 458)</th>
<th>Participants With Thiazide Diuretic Use (N = 173)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone mineral density, g/cm²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At lumbar spine (L1-L4)</td>
<td>1.15 (0.23)</td>
<td>1.13 (0.20)</td>
<td>.47</td>
</tr>
<tr>
<td>At right femoral neck</td>
<td>0.87 (0.15)</td>
<td>0.89 (0.16)</td>
<td>.23</td>
</tr>
<tr>
<td>At left femoral neck</td>
<td>0.87 (0.14)</td>
<td>0.89 (0.14)</td>
<td>.22</td>
</tr>
<tr>
<td>T score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At lumbar spine (L1-L4)</td>
<td>-0.23 (1.90)</td>
<td>-0.39 (1.65)</td>
<td>.34</td>
</tr>
<tr>
<td>At right femoral neck</td>
<td>-1.13 (1.15)</td>
<td>-0.97 (1.10)</td>
<td>.13</td>
</tr>
<tr>
<td>At left femoral neck</td>
<td>-1.16 (1.11)</td>
<td>-1.03 (1.06)</td>
<td>.17</td>
</tr>
<tr>
<td>Z score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At lumbar spine (L1-L4)</td>
<td>0.51 (1.79)</td>
<td>0.28 (1.51)</td>
<td>.14</td>
</tr>
<tr>
<td>At right femoral neck</td>
<td>-0.42 (1.03)</td>
<td>-0.34 (0.95)</td>
<td>.38</td>
</tr>
<tr>
<td>At left femoral neck</td>
<td>-0.46 (0.99)</td>
<td>-0.39 (0.89)</td>
<td>.38</td>
</tr>
</tbody>
</table>
for thiazide use and hip fracture (1.1) that was not statistically significant and reported increased risk for hip fracture with thiazide diuretics when confounding factors were adjusted.\textsuperscript{14} We did not find any positive statistically significant impact of thiazide diuretics on BMD in our study cohort after adjustment of confounding factors, which compliments previously published data.\textsuperscript{13,15}

However, there were a few limitations in our study. Our selection of data was based upon the questionnaire, and in this age group “recall bias” is an important factor. Serial measurements of blood pressure were not obtained; hence, any data on the severity and duration of hypertension were not available, which may contribute to change in BMD over time. Owing to the cross-sectional, nonrandomized nature of the study, causation could not be assessed, though our results do deliberately demonstrate insensitivity of the cross-sectional relationship between hypertension and BMD, but these findings must be interpreted with a good deal of caution. We had no data on vitamin D levels, creatinine, estimated glomerular filtration rate, parathyroid hormone levels, thyroid hormone level, or any other pertinent medical information to assess various other aspects in our study group.

CONCLUSION

Our study shows that there is no association between BMD and hypertension in the elderly African American female population. The association remains insignificant and immaterial whether the BMD is measured at the spine or the hip. The results of our study do question the preventive or therapeutic role of thiazide diuretics in “osteoporosis” as a background in elderly populations. Further prospective studies with larger sample sizes, diverse ethnicities, and narrow age range are needed to evaluate the relationship between BMD and hypertension.

ACKNOWLEDGMENTS

We are thankful to the entire research teams of Obesity Research Center of St Luke’s Roosevelt Hospital Center/University of Columbia and Detroit Medical Center/Wayne State University for their uniring efforts in the completion of this study. We are also thankful to all the physicians and subjects who helped us in data gathering of this study.

REFERENCES


Increasing Knowledge of Cardiovascular Risk Factors Among African Americans by Use of Community Health Workers: The ABCD Community Intervention Pilot Project

Elvan C. Daniels, MD, MPH; Barbara D. Powe, PhD RN; Toye Metoyer, MSPH; Gail McCray, MA, CHES; Peter Baltrus, PhD; George S. Rust, MD, MPH

INTRODUCTION

Although control of cardiovascular disease (CVD) risk factors reduces morbidity and mortality, most Americans at risk for CVD-related events have not achieved therapeutic goals for management of these factors. The American Diabetes Association and the National Diabetes Education Program have promoted use of the ABC approach (glycated hemoglobin $A_1c$, blood pressure, cholesterol) for identifying and controlling the leading indicators of CVD risk. In the present study, researchers added a D factor, for depression, because this disorder is common and also predictive of CVD risk and of control of diabetes. Particularly among low-income African Americans, depression is frequently not targeted or treated. The current study tests the effectiveness of recruiting African Americans in churches and training community health workers (CHWs) to educate their peers about CVD and risk reduction. For the intervention group, CHWs participated in a 16-hour training session and delivered a 6-week tailored educational program with counseling sessions and demonstrations. The control group received a weekly lecture by clinical experts. The CHW active-learning intervention was more effective than lectures by clinical experts in increasing the knowledge of CVD risk. The only significant difference in clinical measures reflected a worsening of $A_1c$ levels in the control group; the CHW intervention group showed a slight improvement. Participants also learned self-management skills, such as taking blood pressure, measuring glucose, and reading labels. Nevertheless, more longitudinal research and a larger sample size are needed to confirm the impact of CHWs in community settings to change factors associated with CVD risk.

Keywords: knowledge, attitudes, and beliefs ■ hypertension ■ diabetes ■ cardiovascular ■ risk factors ■ community health workers ■ African Americans

Funding/Support: This work was supported by Astra Zeneca Pharmaceuticals grant IRUSMLBR0004, Achieving Functional Health Efficacy and Treat-to-Target Goals for ABCD Conditions ($A_1c$, Blood Pressure, Cholesterol, and Depression) Through Culturally-Relevant Community Health Advisors.

African Americans have higher rates of cardiovascular disease (CVD) and poorer outcomes compared to others. The American Diabetes Association and the National Diabetes Education Program have promoted use of the ABC approach (glycated hemoglobin $A_1c$, blood pressure, cholesterol) for identifying and controlling the leading indicators of CVD risk. In the present study, researchers added a D factor, for depression, because this disorder is common and also predictive of CVD risk and of control of diabetes. Particularly among low-income African Americans, depression is frequently not targeted or treated. The current study tests the effectiveness of recruiting African Americans in churches and training community health workers (CHWs) to educate their peers about CVD and risk reduction. For the intervention group, CHWs participated in a 16-hour training session and delivered a 6-week tailored educational program with counseling sessions and demonstrations. The control group received a weekly lecture by clinical experts. The CHW active-learning intervention was more effective than lectures by clinical experts in increasing the knowledge of CVD risk. The only significant difference in clinical measures reflected a worsening of $A_1c$ levels in the control group; the CHW intervention group showed a slight improvement. Participants also learned self-management skills, such as taking blood pressure, measuring glucose, and reading labels. Nevertheless, more longitudinal research and a larger sample size are needed to confirm the impact of CHWs in community settings to change factors associated with CVD risk.
CARDIOVASCULAR DISEASE RISK FACTORS

2006, obesity among persons with diabetes mellitus increased 58%, with the result that an estimated two-thirds of diabetics are also obese (body mass index [BMI] >30 kg/m²). The values are even higher for minority populations and those with low income. Non-Hispanic African American women have higher rates of obesity and diabetes mellitus compared to other racial and ethnic groups. As a result, rates of death and disability due to stroke, heart disease, and complications of uncontrolled diabetes mellitus are 1.5 to 2.5 times higher in African American and other minority populations. Thus, it is appropriate that health care providers identify high-risk groups, tailor educational materials to educate these groups, intervene promptly to reach therapeutic levels of physiologic measures, and monitor outcomes. Increasing knowledge of risk factors, addressing low literacy, and enhancing self-management skills help African Americans control risk factors.

Guided by Bandura’s social learning theory, the current pilot study evaluated the effectiveness of partnering with local churches and use of community health workers (CHWs) to deliver educational programs on CVD to increase knowledge of ABCD risk factors. Specifically, the following questions were posed: Do African American church members who participate in a 6-week, tailored, interactive community program with biweekly counseling delivered by a CHW gain greater knowledge of the ABCD risk factors than those who participate in lecture-based sessions delivered by a physician? Secondly, are there differences in HbA1c levels, cholesterol, blood pressure, depression, and health literacy between the CHW intervention group and the control group at the end of the 6-week intervention period?

THEORETICAL FRAMEWORK

Bandura’s social learning theory suggests that people learn from others, by observation, imitation, and modeling. The social learning theory explains human behavior in terms of continuous reciprocal interactions between cognitive, behavioral, and environmental influences. The current study encompasses Bandura’s social learning theory within the educational interventions by allowing the participants to acquire information from CHWs who also model desired behaviors. As the participants interact with the CHWs, they increase their belief that they can reduce their personal risk and begin to participate more actively in the self-management of their ABCD risk factors.

METHODS

Sample and Setting

For recruitment into this study, churches within a 10-mile radius of an area identified as the city’s high-disparity urban core were targeted. The communities in this area are predominantly African American, and the rate for high school completion is less than 70%. The residents have a median annual income of less than $29,000, and approximately one-third live below the poverty level. Inclusion criteria for participating churches were: (a) location within the urban core; (b) a congregation more than 50% African American; and (c) an established health ministry within the church. Based on knowledge of the community and previous work with churches in the area, the project manager used a purposeful approach to identify churches and to discuss the study with the church’s senior pastor. Four pastors agreed to participate; these congregations were 95% to 100% African American. The churches were randomly assigned to either the CHW intervention group (n = 2) or the control (n = 2) group. This study was approved by the Morehouse School of Medicine institutional review board prior to implementation.

Procedures

Recruiting community health workers from targeted churches. Pastors were asked to recommend people from their congregations who were considered candidates for the role of a CHW. Inclusion criteria for CHWs were: African American race, age of at least 18 years, ability to speak English, being a member of the church or surrounding community, and diagnosis of 1 or more of the ABCD risk factors that were therapeutically controlled, as determined by self-report. The research team interviewed these persons and selected individuals based on inclusion criteria and availability to attend required training and conduct workshops. CHWs (N = 12) selected for participation in the study were randomly assigned to the intervention or control group.

Training of community health workers. The CHWs participated in 16 hours of training delivered at the churches by the study’s principal investigator or project manager. The CHWs, who were required to attend all of the sessions, worked with the project manager to make up the time if they had to miss a session. They were also required to pass an online course on protection of human subjects. The training was designed to prepare the CHWs to: (1) recruit participants for the study; (2) teach participants about ABCD risk factors; (3) teach participants how to take their blood pressure and glucose readings and how to interpret the physiological measures (blood pressure, HbA1c, cholesterol); (4) teach participants about signs and symptoms of depression; (5) teach participants to read nutrition labels; (6) teach participants effective and assertive skills for communicating with their providers; and (7) teach participants to read a prescription bottle and an appointment reminder card. The CHWs assigned to the intervention churches received extra training in how to make the sessions interactive, using a hands-on approach with return demonstrations from the participants. They were also trained in how to respond to questions and to defer answering questions.
regarding clinical management and treatment to a health care professional. The training was based on the standards from the National Diabetes Education Program; the National Cholesterol Education Program Adult Treatment Panel III Guidelines; the Seventh Report of the Joint National Committee on the Prevention, Detection, Evaluation and Treatment of High Blood Pressure guidelines; and the health literacy tool kit of the American Medical Association Foundation. For their participation in the project, CHWs received a stipend covering their time and travel to study sites.

**Recruiting participants for the intervention and control groups.** The CHWs were responsible for recruiting participants for their groups. This was accomplished primarily at health fairs held at each church. There was additional recruitment by placing fliers in the church bulletin with contact information for the CHW, as well as by word of mouth within the church. The goal was to recruit 15 participants from each church. The following inclusion criteria were used to screen for eligibility: (1) African American race; (2) age of at least 18 years; (3) ability to speak English; (4) being a member of the church or residence in the community surrounding the church; and (5) diagnosis with 1 of the ABC risk factors by self-report; being at risk for ABC risk factors by either self-reported family history of diabetes, hypertension, or hyperlipidemia; and/or being overweight (BMI 25-29.9) or obese (BMI >30).

**Assessment of knowledge, anthropometric, and physiologic measures.** At the initial meeting, baseline surveys were completed and physiological measures (blood pressure, glucose, cholesterol) were taken by the CHWs in both the intervention and control groups. These measures were also repeated at the final workshop in both groups. All participants signed consent forms to release elevated laboratory values to their primary care providers. The 2 participants that did not have a primary care medical home were given a list of local primary care providers. All Patient Health Questionnaire (PHQ)-9 scores over 5 were reviewed the same day with participants by a Morehouse School of Medicine primary care or behavioral health faculty member to privately discuss scores and obtain pertinent personal and family history. None of the participants with PHQ-9 scores greater than 5 were suicidal. All were instructed to follow up with their primary care provider the following week.

**Community health worker intervention group.** The intervention consisted of 6 weekly sessions held at each of the churches and led by the CHWs. At the initial meeting, baseline surveys were completed and physiological measures (blood pressure, glucose, cholesterol) were taken by the CHWs. The sessions covered a different topic each week (Table 1). Each topic included a predetermined set of objectives. For example, the objectives for the topic on obesity were: (a) define obesity and overweight; (b) name the chronic illnesses associated with obesity and overweight; (c) define BMI and how to calculate it; d) learn to read food labels; and e) learn how to incorporate physical activity into daily routines.

### Table 1. ABCD Training Program

<table>
<thead>
<tr>
<th>Topic</th>
<th>Content</th>
<th>Skills Taught</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>Definition and role of community health workers</td>
<td>Teaching skills, communication skills, resource building, capacity building</td>
</tr>
</tbody>
</table>
| Session 1: Health communication | • Questions to ask during medical visit  
• How to be assertive during medical visit  
• Understanding food labels and medical instructions | • Ask Me 3  
• Reading labels |
| Session 2: Obesity  | Definition, risk factors, prevention, and management of obesity | • Calculating BMI  
• Low-impact exercise  
• Reading food labels for portion size, counting steps using pedometers |
| Session 3: Diabetes mellitus | • Definition, risk factors, prevention, and management of diabetes mellitus  
• HbA1c | • Proper way to measure blood sugar using a glucometer  
• Reading food labels for carbohydrate content |
| Session 4: Hypertension | Definition, risk factors, prevention, and management, blood pressure | • Proper way to obtain blood pressure using hand-held blood pressure cuff  
• Reading food labels for salt content, reading prescription labels |
| Session 5: Cholesterol | Definition, risk factors, prevention, and management | Reading food labels for fat content |
| Session 6: Depression | Definition, risk factors, recognizing signs, getting help | Taking the PHQ-9 |
| Bioethics (core competency) | Human subjects protection | Privacy, confidentiality, Health Insurance Portability and Accountability Act regulations |
Demonstration and role playing were used to emphasize key concepts. For example, when the topic was how to read a food label, actual labels were used and participants were allowed to interpret the labels. The CHWs gave feedback and provided tips to make sure the participants mastered the concept. The discussion of blood pressure was followed with an interactive session on teaching the participant to take their blood pressure and to interpret the readings. Between weekly sessions, CHWs were available via phone for peer counseling or to help participants navigate through the health care system. These sessions were initiated by the participant. During the 16 weeks, 12 participants in the intervention churches contacted the CHWs for advice or counseling.

**Control Group**

Participants in the control group also attended 6 weekly sessions at each of the 2 churches. Topics (same as for the intervention group) were presented by a physician from the principal investigator’s academic facility instead of by the CHW’s facility. Sessions were presented in a lecture format (40 min) with a 20-minute question-and-answer period, and the CHWs were not available to answer questions or provide support after the weekly sessions.

**Data Collection Instruments**

**Knowledge of cardiovascular risk factors.** A 19-item, investigator-developed survey was used to assess knowledge of cardiovascular risk factors. One point was added for each correct response; higher scores indicated greater knowledge of risk factors (range, 0-19 points). The questions focused on risk factors, signs and symptoms of cardiovascular disease, and interpretation of food and prescription labels.

**Health literacy measure.** For both groups, the short version for the Test of Functional Health Literacy in Adults (s-TOFHLA) was used to assess health literacy at the beginning and end of the 6-week sessions. The s-TOFHLA is a shorter version of the parent tool (TOFHLA) used to measure patients’ ability to read and understand health-related materials; it has established reliability and validity.18

**Depression.** Depression was assessed by use of the PHQ-9, a 9-item depression scale of the PHQ that assists clinicians in diagnosing depression and in selecting and monitoring treatment.19,20 Participants are asked to reflect on the past 2 weeks and answer 9 questions on a 4-point Likert scale ranging from “not at all” (0 points) to “nearly all the time” (3 points). Summed scores of 10 or higher have 88% sensitivity and 88% specificity for major depression. Scores of 5, 10, 15, and 20 represent mild, moderate, moderately severe, and severe episodes of depression, respectively.19

**Clinical measures.** A glucometer (Accu-Chek Instant Plus, Roche Diagnostics Corp, Indianapolis, Indiana) was used to measure blood glucose. HbA1c was measured by use of kits from Metrika A1c Now, Sunnyvale, California. DINAMAP Pro 1000 monitoring systems (Wipro GE Healthcare, Bangalore, India) were used to assess blood pressure, and cholesterol was measured with Cholestech LDX monitors (Hayward, California). Measurements of weight, height, and waist circumference were also taken.

**RESULTS**

Initially, 47 participants (n = 19 intervention, n = 28 control) were recruited for the study. Due to missing data and attrition, only 25 participants had pretest and posttest knowledge scores for analysis (intervention group, 14; control group, 11). Most of the participants (N = 25) were female (68%), all were African American, 60% had some college experience or a bachelor’s degree. Of the participants at baseline, 14% had elevated HbA1c.

<table>
<thead>
<tr>
<th>Table 2. Pretest and Posttest Measures: Intervention Group, Mean Values</th>
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<tbody>
<tr>
<td><strong>Measures</strong></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Risk factor knowledge (scale, 0-19)</td>
</tr>
<tr>
<td>Test of Functional Health Literacy in Adults prescription (scale, 0-12)</td>
</tr>
<tr>
<td>Test of Functional Health Literacy in Adults, Short Version (scale, 0-36)</td>
</tr>
<tr>
<td>Systolic blood pressure, mm Hg</td>
</tr>
<tr>
<td>Diastolic blood pressure, mm Hg</td>
</tr>
<tr>
<td>Low-density lipoprotein cholesterol, mg/dL</td>
</tr>
<tr>
<td>High-density lipoprotein cholesterol, mg/dL</td>
</tr>
<tr>
<td>Total cholesterol, mg/dL</td>
</tr>
<tr>
<td>Triglycerides, mg/dL</td>
</tr>
<tr>
<td>Glycated hemoglobin A1c, %</td>
</tr>
<tr>
<td>Weight, kg</td>
</tr>
<tr>
<td>Waist, cm</td>
</tr>
<tr>
<td>Patient Health Questionnaire 9 (depression, scale, 0-27)</td>
</tr>
</tbody>
</table>

* Paired t test statistically significant at .05.
89% had systolic blood pressure values above 139 mm Hg or diastolic blood pressure above 89 mm Hg, and 25% had elevated LDL cholesterol; 60% had more than 1 ABCD risk factor. At baseline, there were 3 participants in both the control and intervention groups with PHQ-9 scores of at least 5 and less than or equal to 10, but only 1 had a PHQ-9 score greater than 9 (raw score, 10). Regarding baseline health literacy (s-TOFHLA >23), both groups scored high (mean score, 31.87 in intervention group and 23 in control group). All of these participants had either Medicaid or Medicare. Both groups had comparable levels of overweight and obesity (BMI >25): 80% of the control groups and 83% of the intervention groups.

### Comparison of Knowledge of ABCD Risk Factors

Baseline (pretest) knowledge scores between intervention and control groups. Between participants in the intervention group and the control group, there was no significant difference at baseline in the scores relating to knowledge of CVD risk factors. 

\[
\bar{X} = 12.91 \quad \text{and} \quad \bar{X} = 11.07 \quad (df = 36.28; t = 1.70; p = .098)
\]

### Changes in Knowledge Scores within Groups

Paired t tests comparing pretest and posttest scores were used to assess changes in knowledge within the CHW group following the 6-week intervention (Table 2). The knowledge score for this group had risen by 2.64 points from baseline \((p = .011)\). There were no significant changes in TOFHLA or S-TOFHLA scores.

### Changes in posttest knowledge scores in the intervention and control groups.

An independent-sample t test was used to compare change in knowledge of CVD risk factors between the 2 groups at 6 weeks post test (Table 3). The CHW intervention group had significantly higher change in knowledge (+ 2.64) of CVD risk factors compared to the control group, which had a 1.30 decline in score \((p = .0472)\). There were, however, no significant differences in the change in health literacy score between the CHW and control group, as determined by TOFHLA and s-TOFHLA. Regarding the TOFHLA, only questions pertaining to the ability to reading a prescription label were asked.

### Differences in Clinical Measures

The intervention group had a 6.92-mg/dL decrease in HDL-C \((p = .0480)\) and a 6.31-mm Hg decrease in diastolic blood pressure \((p = .0507)\). Other measures (HbA\(_1c\), cholesterol, and depression) did not show a significant change after the intervention \((Table 2)\). A rise of 0.5% in HbA\(_1c\) levels among control group participants combined with a slight HbA\(_1c\) decrease among the intervention group, however, resulted in significant difference change in HbA\(_1c\) between the 2 groups at the posttest measurement \((difference = –0.59, p = .028)\).

### DISCUSSION

This pilot project demonstrates the feasibility of engaging African American churches and recruiting CHWs and training them to implement a 6-week educational intervention aimed at increasing knowledge and controlling physiological CVD risk factors among study participants. While generalization of these findings is limited due to nonrandom sampling, small sample sizes, and participant attrition at the posttest, the findings provide “lessons learned” and points for discussion that can guide future studies.

This study supports the effectiveness of targeting African American churches within communities to recruit study participants and CHWs, as well as the effectiveness of the CHWs in teaching key self-management skills, such as how to measure blood pressure and blood glucose, understand nutrition labels, read a prescription label, and interpret cholesterol results. The relationship between learning these skills and significant changes in health literacy was not observed.

### Table 3. Posttest Changes for Intervention and Control Groups Mean Values

<table>
<thead>
<tr>
<th>Measures</th>
<th>Intervention</th>
<th>Control</th>
<th>Difference</th>
<th>p Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular risk factor knowledge (scale, 0-19)</td>
<td>2.64</td>
<td>-1.30</td>
<td>3.94</td>
<td>.0472*</td>
</tr>
<tr>
<td>Test of Functional Health Literacy (scale, 0-19)</td>
<td>2.20</td>
<td>2.40</td>
<td>-0.20</td>
<td>.9264</td>
</tr>
<tr>
<td>Test of Functional Health Literacy, Short Version (scale, 0-36)</td>
<td>0.80</td>
<td>0.88</td>
<td>-0.08</td>
<td>.9888</td>
</tr>
<tr>
<td>Systolic blood pressure, mm Hg</td>
<td>-4.15</td>
<td>-6.5</td>
<td>2.35</td>
<td>.8012</td>
</tr>
<tr>
<td>Diastolic blood pressure, mm Hg</td>
<td>-6.31</td>
<td>2.38</td>
<td>-8.68</td>
<td>.1001</td>
</tr>
<tr>
<td>Low-density lipoprotein cholesterol, mg/dL</td>
<td>16.17</td>
<td>-14.5</td>
<td>30.67</td>
<td>.3551</td>
</tr>
<tr>
<td>High-density lipoprotein cholesterol, mg/dL</td>
<td>-6.92</td>
<td>0.25</td>
<td>-7.17</td>
<td>.2748</td>
</tr>
<tr>
<td>Total cholesterol, mg/dL</td>
<td>0.08</td>
<td>-20.5</td>
<td>20.58</td>
<td>.4968</td>
</tr>
<tr>
<td>Glycated hemoglobin A(_1c), %</td>
<td>-0.054</td>
<td>0.54</td>
<td>-0.59</td>
<td>.0279*</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>-0.08</td>
<td>-0.84</td>
<td>0.04</td>
<td>.9905</td>
</tr>
<tr>
<td>Waist, cm</td>
<td>0.15</td>
<td>1.46</td>
<td>-1.31</td>
<td>.1101</td>
</tr>
<tr>
<td>Patient Health Questionnaire 9 (depression, scale, 0-27)</td>
<td>-0.5</td>
<td>0.6</td>
<td>-1.1</td>
<td>.5910</td>
</tr>
</tbody>
</table>

* Independent samples t test statistically significant at .05.
therapeutic control of these physiological measures will be assessed in future studies. The fact that CHWs, using interactive coaching and peer counseling techniques, outperformed lectures by medical school faculty in improving risk factor knowledge is consistent with Bandura’s social learning theory in that since the CHWs shared similar cultural values and CVD risk factors, they could speak directly to others about their experiences and model positive behaviors.

These findings are also consistent with results of other research utilizing CHWs to deliver interventions. In a longitudinal, multicenter trial involving 32 churches and CHWs to deliver educational sessions and biweekly counseling on CVD risk (obesity, physical activity) to African American women over a 4-month study period, there were significant changes in knowledge of signs, symptoms, and CVD risk factors within the intervention group.21 Similarly, a randomized, controlled trial of an intensive diabetes mellitus self-management intervention (individual counseling, 12 group sessions, monthly telephone calls, and postcard contact) showed a significant decrease in HbA1c within the intervention group, although there was no significant difference in HbA1c change between the intervention and the control group (which received pamphlets in a setting of an African American church).22

The fact that measures of global health literacy (s-TOFHLA) did not change significantly in a short-term, low-intensity intervention is not unexpected, since such knowledge and literacy are acquired over a lifetime. Studies that have used more intensive interventions specifically targeting literacy over longer times have shown success in enhancing literacy skills among African Americans with diabetes mellitus.23 Further, health literacy tests may not capture the cultural attitudes, values, and beliefs that influence how a person receives and interprets information.24

**Implications for Research and Practice**

The findings demonstrate the feasibility of the intervention and its impact on knowledge but showed limited impact on the more clinically related outcomes. Several implications for additional research are identified. Specifically, given the breadth of the questions, it is not known which aspects of CVD knowledge (based on the survey) were most improved. It may be feasible to tailor the intervention to focus on more specific areas of risk and posttest in these areas separately. In addition, it is not clear why the attrition rate for both groups was high. Based on attendance logs, participants who had only Hypertension or hyperlipidemia were more likely to attend the workshops targeting those conditions. Follow-up strategies must be built in to determine reasons for study dropout. Additionally, strategies to reengage the participants should be developed. Perhaps the 6-week interval is too long, and the project needs to be broken down into 3-week intervals, although changes in clinical outcomes may require more prolonged intervention. Future studies will test the effectiveness of a condensed program with a follow-up maintenance phase to define the optimal timing of the program for achieving better clinical outcomes and lower attrition rates. Additionally, we plan to incorporate more time in the preimplementation phase by collaboratively working with church ministries to develop strategies for promoting and sustaining the program once implemented.

While there were no significant differences in these measures between the groups after the intervention, this pilot study lasted only 6 weeks and had a small number of participants. Longer follow-up would likely be required to measure such changes. Further research is needed on the impact of CHWs in the reduction of global CVD risk, ie, multiple risk reduction interventions. In addition, future studies should incorporate tighter integration with the medical home for primary care. For example, the relative efficacy of changes in lifestyle vs medication on reducing systolic blood pressure suggests that future CHW interventions will need to incorporate a direct link to a primary care medical home that can address effective “treat-to-target” pharmacologic interventions for controlling blood pressure. Assessing the cost-effectiveness of employing CHWs to reduce health risks is also an area of need for future research.

Future studies should add more intensive interventions and measurements for the D (depression) CVD risk factor. African Americans with diabetes mellitus are less likely than Caucasian Americans to take antidepressant medications, and untreated depression has been associated with difficulty in self-management of diabetes mellitus.2 The severity of the depression and its influence on self-management activities for CVD risk should also be assessed. While the CHWs were trained to discuss signs and symptoms of depression with participants, they are not clinicians. Future studies should link participants to a primary care home for more intensive treatment of the D factor. Perhaps CHWs can be navigators in helping these individuals to seek medical care, identify a medical home, and effectively deal with the stigma that is often associated with mental health issues.

**CONCLUSION**

African American communities have a unique culture that may pose barriers to accessing health information. Simplifying the reading level of materials, previously developed for high-literacy populations, or developing videos or graphics-driven print materials may not be sufficient to address these needs. Partnerships with churches and use of CHWs to tailor interventions with African Americans is an effective strategy for improving functional knowledge and self-management skills related to multiple CVD risk factors. Further research is needed to
identify appropriate content, duration, and intensity of contact between CHWs and research subjects to achieve measurable improvements in health literacy, in individual CVD risk factors, and in overall cardiac risk.

REFERENCES
Promoting Heart Health: An HBCU Collaboration With the Living Heart Foundation and the National Football League Retired Players Association

Peggy Valentine, EdD, MA, FASAHP; Vanessa Duren-Winfield, PhD, MS; Elijah O. Onsomu, PhD, MS, MPH, CHES; Eddie L. Hoover, MD; Cheryl E. Cammock, MD; Arthur Roberts, MD

INTRODUCTION

Cardiovascular disease (CVD) continues to be the leading cause of death in the United States and African Americans are disproportionately affected. Cardiovascular disease risk factors such as obesity, hypertension, family history of heart disease, and physical inactivity are often higher in African American young adults. The aim of the current study was to assess cardiovascular disease risk factors at a historically black college and university (HBCU) in North Carolina.

Methods: A collaborative partnership was established that included Living Heart Foundation, the NFL Retired Players Association and a HBCU. Ninety-one students (77 females and 14 males) aged 18 to 55 years (mean, 24 y, SD = 9 y) were recruited via dissemination of flyers, brochures, mass e-mailing, and announcements. Demographic and medical history data were collected. Stata version 10.1 was used for all analyses.

Results: Fifty-three percent of the participants reported having experienced a chronic health condition, 32% were overweight (body mass index [BMI], 25-29.9 kg/m²) and 31% obese (BMI ≥30 kg/m²). Five percent of females and 23% of males had high-density lipoprotein cholesterol of 40 mg/dL or less, indicative of a risk for developing heart disease.

Conclusion: There is an urgent need to intervene among African American college students and address behavioral risk factors for cardiovascular disease. Such interventions may have a major impact on their overall and future health outcomes. Strategies to be employed need to focus on the integration of culturally appropriate healthy lifestyle programs into the curriculum and university health centers. Consultations with stakeholders for ideas and resources should be encouraged.

Keywords: cardiovascular disease ■ historically black colleges/universities ■ chronic diseases ■ African Americans ■ students


Funding/Support: This study was made possible by funding from the Living Heart Foundation, National Football League (NFL) Retired Players Association, and Winston-Salem State University School of Health Science.

Introduction: Cardiovascular disease continues to be the leading cause of death in the United States and African Americans are disproportionately affected. Cardiovascular disease risk factors such as obesity, hypertension, family history of heart disease, and physical inactivity are often higher in African American young adults. The aim of the current study was to assess cardiovascular disease risk factors at a historically black college and university (HBCU) in North Carolina.

Methods: A collaborative partnership was established that included Living Heart Foundation, the NFL Retired Players Association and a HBCU. Ninety-one students (77 females and 14 males) aged 18 to 55 years (mean, 24 y, SD = 9 y) were recruited via dissemination of flyers, brochures, mass e-mailing, and announcements. Demographic and medical history data were collected. Stata version 10.1 was used for all analyses.

Results: Fifty-three percent of the participants reported having experienced a chronic health condition, 32% were overweight (body mass index [BMI], 25-29.9 kg/m²) and 31% obese (BMI ≥30 kg/m²). Five percent of females and 23% of males had high-density lipoprotein cholesterol of 40 mg/dL or less, indicative of a risk for developing heart disease.

Conclusion: There is an urgent need to intervene among African American college students and address behavioral risk factors for cardiovascular disease. Such interventions may have a major impact on their overall and future health outcomes. Strategies to be employed need to focus on the integration of culturally appropriate healthy lifestyle programs into the curriculum and university health centers. Consultations with stakeholders for ideas and resources should be encouraged.

Keywords: cardiovascular disease ■ historically black colleges/universities ■ chronic diseases ■ African Americans ■ students


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INTRODUCTION

Cardiovascular disease (CVD) continues to be the leading cause of death in the United States, and African Americans are disproportionately affected. Representing only 12% of the US population, African Americans account for more than 25% of all heart disease deaths. An estimated 80 million adults in the United States are affected by CVD, which includes coronary heart disease, heart failure, stroke, and high blood pressure. As the leading cause of death, nearly 2400 people die of CVD each day—1 death every 37 seconds. As the baby boomers age, heart disease deaths are projected to increase 2.5 times faster than the general population, and the prevalence of heart disease is projected to increase by 16% each decade, and North Carolina is not without exception.

In 2008, CVD accounted for 31% of all deaths in North Carolina. Women are disproportionately affected, although males die at a younger age. Nearly one-third of all deaths among males under age 65 years (29%), compared to 13% of females, are attributed to CVD. There are significant and growing health disparities between African Americans and whites in North Carolina for CVD deaths, hospitalizations, and CVD risk factors. CVD risk factors such as poor nutrition, hypertension, diet high in sodium, family history of heart disease, overweight/obesity status, and physical inactivity mimic national trends showing greater frequency among African Americans in North Carolina.

CARDIOVASCULAR DISEASE RISK FACTORS

In 2007, North Carolina residents ranked fairly poor on fruit and vegetable consumption, with only 22%
reporting having consumed 5 fruits and vegetables on a daily basis, compared to 24% of the US population. In 2008, nearly two-thirds (66%) of North Carolina adults were either overweight or obese. Seventy-six percent of North Carolina African Americans who have hypertension had a high intake of sodium in their diet (≥1500 mg/day). Another major risk factor for CVD is being overweight or obese. This is, in part, attributed to a lack of physical activity consisting of “at least 30 minutes of moderate-intensity physical activity on 5 or more days of the week or at least 20 minutes of vigorous-intensity physical activity on 3 or more days of the week.” Lastly, having family history of heart disease is a strong CVD risk factor and should be closely monitored particularly among the African American population. Despite efforts to educate both the public and health care providers about preventive measures to combat CVD risk factors, maintaining control of these factors remains suboptimal and poses a particular threat among minorities and underrepresented groups.

**Inactivity Among College Students**

According to the National Center for Health Statistics, inactivity is ranked as the No. 1 risk factor for CVD, followed by obesity. Obesity among US adolescents has reached epidemic proportions, particularly for African Americans and Latinos. Further, obesity-related chronic diseases previously found in adults are increasingly affecting young Americans. In fact, the awareness and prevention of CVD risk factors among college-aged African Americans may be critical at this juncture in their lives. Unfortunately, obesity rates have increased most rapidly among 18- to 29-year-olds, including those with some college education. According to the National College Health Risk Behavior Survey, 35% of college students may be overweight or obese and this number is slightly higher (40%) in African Americans.

**Cardiovascular Disease Assessments: The Role of HBCUs**

Historically black colleges and universities (HBCUs) campuses serve as optimal locations to provide health screening and subsequent identification of CVD risk factors among African American college students. Many of these institutions have played a significant role in producing scholars and individuals who work toward improving the health and wellness of the communities in which they inhabit. Community engagement provides a fundamental component to addressing social determinants of health and eradicating inequities that exist within health, society, and the environment. Also, while college plays an important part for young adults’ transition in social and academic experiences, it is also a central institution where many of them reside. It also serves as a meaningful environment to institute health education and health-promoting activities for this age group.

On a daily basis, college students are exposed to numerous health issues, such as the common cold, sexually transmitted diseases, alcohol abuse, and chronic diseases. Many environmental, cultural, and societal forces impact students and influence them to behave in a specific manner, especially when it comes to food, drinking, and exercise choices. These influences may have long-lasting effects on body weight and health, which may lead to unfavorable health outcomes such as CVD and obesity later in life, particularly for African American students, who are disproportionately affected.

There is an urgent need to conduct assessments to help African American young adults understand the importance of identifying and addressing CVD risk factors that can affect their future health. They need to learn how to assess their own family history, health and health behaviors, lifestyle choices, as well as develop the self-efficacy to make behavioral changes that improve lifelong cardiovascular health. Few studies to date have examined cardiovascular risks among the African American college population, despite reports that being overweight and/or obese affects approximately 30% of US college students. Therefore, it is imperative that awareness and prevention of such risk factors associated with CVD among college-aged African American students is critical.

This paper describes a cardiovascular risk factor and general health screening study called Rams Have HEART. It was designed to identify CVD risk factors of HBCU college-aged students. Data results were used to guide the development of a health education and risk-reduction program specifically for HBCU college students. The theme, Rams Have HEART, was selected based on the following premise: the ram represents our university’s mascot, and “have heart” denotes the fact we are serious about the “heart” health of our students at Winston-Salem State University (WSSU). The current study seeks to assess CVD risk factors at an HBCU in North Carolina.

**METHODOLOGY**

**Partnerships**

A unique partnership was initiated by Living Heart Foundation, a not-for-profit organization founded by a cardiac surgeon who was a former quarterback in the National Football League (NFL). Currently, he is working with the NFL Retired Players Association to help promote a healthy lifestyle in this cohort once they no longer have the resources of the NFL in retirement. This alliance brought together the NFL Retired Players Association; WSSU (an HBCU located in the stroke belt of North Carolina); and a regional hospital partner, Wake Forest University Baptist Medical Center.
Student Recruitment

Subjects. One hundred twenty-one students were recruited from the total student population of nearly 6200; the recruitment goal was 100 students. Ninety-one students—85% female, 80% African American, and 90% undergraduate—participated in the study (Table 1).

Recruitment activities. Recruitment activities included the following: (a) disseminating flyers and brochures throughout the campus, where students were more likely to congregate, such as the student union, library, computer rooms, food court, and dormitories; (b) mass e-mailing; (c) providing announcements via campus organizations and social gatherings; and (d) informing students at various student assemblies. A Web site was developed that provided additional information about the study and served as a means for students to enroll, select an appointment time for their health assessment, download the consent form and medical history questionnaire. The Web site also served as a marketing tool and incentive to enhance recruitment for Rams Have HEART screening program, which aimed at promoting heart health. Students who enrolled on the Web site were eligible to participate in a drawing to win a pair of NFL football tickets and all-expenses-paid trip to attend a game.

Setting. Study assessments were conducted on the WSSU campus at the A.H. Ray Student Health Center October 29, 2009, from 7 AM to 7 PM, with the assistance of the center’s staff, technical assistants from the Living Heart Foundation, WSSU School of Health Sciences faculty and students, and other health care providers from Wake Forest University Baptist Medical Center (the regional hospital partner offering their time to assist in this endeavor).

Consenting. Participation was voluntary and inclusive of all students aged 18 years and older enrolled at the university with no prior diagnosis of CVD. Each student was informed of the nature and the scope of the project that included its purpose, risks, and benefits, and completed consenting procedures approved by the human subjects committee of the WSSU institutional review board.

Instrument. A demographic outline and medical history questionnaire were used to collect the student’s medical history and medications, nutritional health status, exercise performance, and lifestyle health profile.

Fasting. Participants were required to fast for 12 hours prior to the 3-hour testing period.

Medical History Questionnaire

Students completed a self-administered 24-item questionnaire that included demographics, hospitalization and medications history, past and current health problems, lifestyle and physical activities, nutritional and mental health status, smoking, drinking, and cardiovascular problems and procedures.

Race and ethnicity were based on the student’s identification with 1 of the categories that included Caucasian, African American, Asian, Hispanic, and other. Sex was measured by one being either male or female. For education status, a selection was made to establish the highest education level achieved: elementary school, high school, college, or graduate school. If an individual had been hospitalized within the past 12 months and if the hospitalization had been an emergency, subsequent questions were asked about reasons for hospitalization and type of surgeries with month and year. Past and current health problems were determined by a checklist of 29 items, with each question having 3 answer choices: never had the condition, had this condition in the past, and currently have this condition. Medications were determined by a checklist of 16 items, with each question having 3 choices: never used this type of medication, used this medication in the past, and currently using this medication. Furthermore, current dosage and name of medicine was also asked.

Allergies were determined by a checklist of 9 items, with each question having 3 choices: never been allergic to this substance, been allergic to this substance in the past, and currently allergic to this substance. Mental health was determined by a checklist of 4 items, with each question having 3 choices: never had this illness, had this illness in the past, and currently have this illness. Lifestyle was determined by a checklist of 14 items, with each question having 4 choices: rarely or never, sometimes, often, and usually. Leisure activity was determined by a checklist of 3 items, with each question having 5 choices: none, less than 1 hour, 1 to 2 hours, 2 to 4 hours, and more than 4 hours. Nutritional status was determined by a checklist of 9 items, with each question having 2 choices: yes and no. Physical activity was determined by a checklist of 5 items, with each question having 5 choices: none, less than 10 minutes, 10 to 30 minutes, 31 to 59 minutes, and more than 60 minutes.

With regards to smoking, students were asked several questions related to smoking, but for this study we only report current smoking habits. Therefore, smoking was determined by 1 question having 2 choices—yes and no—with a follow-up question on the number of cigarettes smoked per day if the response was yes.

Several questions as they relate to drinking were asked to the students. However, for this study, we only report if students had ever drunk alcoholic beverages or if they currently drink more than 2 alcoholic beverages a day—both determined by 1 question having 2 choices (yes and no).

Cardiovascular problems were determined by a checklist of 6 items, with each question having 2 choices: yes and no. Family history of cardiovascular death was determined by 1 question having 2 choices (yes and no); if one answered yes, the relationship with the deceased
was also requested. Lastly, students were also asked if they saw a physician on a regular basis (at least on a yearly basis). This was determined by a 1-item question having 2 choices: yes and no. For this paper, we are reporting on survey items related to CVD.

Protocol

Eight stations were set up the day before the screening with equipment and supplies to assure a smooth transition for students when they arrived. Stations included registration; human subjects consenting and completion of questionnaire; body mass index (BMI); venipuncture (glucose, hemoglobin A1c [HbA1c], cholesterol profile); height, weight, and blood pressure; echocardiogram, electrocardiogram; and food/refreshments. All study personnel and volunteers were compliant with Health Insurance Portability and Accountability Act and certified by Human Subjects. Students were called the day before the assessment and reminded to arrive having fasted (no food in the past 12 hours). Upon arrival to the student health center, each student was greeted by a trained intake volunteer, who confirmed their name and appointment time based on the preregistration list generated from the study Web site database. Students then proceeded to a private area, where they were consented and completed a medical history questionnaire (if it had not been completed prior to their arrival). Each was given a numeric card with instructions to carry at all times as they rotated from one station to the next. Walk-ins (unregistered students) were not turned away; rather, they were required to wait until those who had preregistered had completed their assessments. When students completed their last assessment, a raffle ticket was offered. Participation was not mandatory; however, they had to provide contact information if they wanted to be considered for the NFL raffle giveaway. The majority of students participated and a winner was announced the next day.

Assessment Procedures

Students were given in-depth information about the tests and procedures to be performed as part of the health assessment, which included demographic and medical history information, body composition, fasting blood measures, and CVD assessment. The following describes the specific procedures:

- Participants were asked to complete a questionnaire about their medical history and medications, nutritional health status, exercise performance, and lifestyle health profile.
- BMI and body fat measurements were determined by a Tanita bioimpedance scale. Standard measurements of height and weight were obtained, as well as waist, neck, and hip circumferences determined.
- Blood pressure was measured in all subjects using standard manual techniques, while participants were seated comfortably over a 6- to 8-minute time period. Three blood pressure readings were recorded, including at baseline and at 2 additional times at 3-minute intervals. The average blood pressure recording was determined and analyzed.
- Diagnostic testing was performed by a local laboratory company on blood sugar (glucose), triglycerides, and cholesterol profiles (blood lipid fractions) from blood samples.
- An electrocardiogram and echocardiogram were performed.

RESULTS

Respondents

The participants consisted of 91 students between 18 and 55 years of age. The average age was 24 years (SD = 9 years). Of the 91 participants, 90% were undergraduates. Of the total participants, 85% were female and 15% male, of whom 16% were white, 80% African American, 2% Hispanic, and 2% of another race (Table 1). Fifty-three percent of the participants had a health condition (heart attack, stroke, diabetes, heart murmur, skipped heartbeats/arrhythmia, high blood cholesterol, high blood pressure, chest pain/pressure, unusual fatigue, peripheral vascular disease, and weight problem) in the past or were currently experiencing one. Furthermore, 15% had a family history of heart disease, 8% reported having a cardiac problem (heart attack or congestive heart failure) or having had a cardiac procedure (coronary bypass surgery, angioplasty [PTCA], cardiac catheterization, or heart valve surgery). Six percent of the respondents reported to be currently using cardiovascular medication; 2% have used this medication in the past 5 years.

Assessments

Of the total participants, 63% were either overweight (BMI, 25-29.9), representing 32% (n = 29); or obese (BMI ≥30), representing 31% (n = 29). Furthermore, after stratifying by age, the majority of the participants had been either overweight or obese for 19 years or less (n = 23 [59%]), for 20 to 24 years (n = 17 [68%]), for 25 to 29 years (n = 3 [37%]); and for more than 30 years (n = 13 [76%]) (Table 2). For HbA1c, 7 students were either at very high risk of developing diabetes or were diabetic (HbA1c ≥6.0), with another 52 students being at high risk (HbA1c 5.5-5.9) of developing diabetes. However, for plasma glucose level, only 6 students were prediabetic (100-125 mg/dL) for impaired fasting glucose and another 2 students were diabetic (≥126 mg/dL). Twelve students had borderline-high values for total cholesterol (200-239 mg/dL) and only 2 students had high values for total cholesterol (≥240 mg/dL). Only 14 students had either a borderline-high value or high value for low-density lipoprotein cholesterol.
PROMOTING HEART HEALTH: AN HBCU EXPERIENCE

After stratifying by sex, 4 female and 3 male students had high-density lipoprotein cholesterol values of 40 mg/dL or less, indicative of a major risk of developing a heart attack. Six students had either a borderline-high value (150-199 mg/dL) or high value (200-499 mg/dL) for triglycerides (Adult Treatment Panel III levels), an indication of being at high risk of developing heart disease and stroke. For blood pressure, 16 students (systolic) and 14 students (diastolic) were either prehypertensive or at stage I hypertension (Table 1). Fifty-four students (62%) reported fewer than 30 minutes of physical activity per day.

### Table 1. Study Population Demographics and Medical Health Assessment Results

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
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</tr>
<tr>
<td>Male</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Female</td>
<td>77</td>
<td>85</td>
</tr>
<tr>
<td><strong>Race/ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>African American</td>
<td>73</td>
<td>80</td>
</tr>
<tr>
<td>Hispanic</td>
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<td>2</td>
</tr>
<tr>
<td>Other</td>
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<td>2</td>
</tr>
<tr>
<td><strong>Age, y</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤19</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td>20-24</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>25-29</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>≥30</td>
<td>17</td>
<td>19</td>
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<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergraduate</td>
<td>82</td>
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</tr>
<tr>
<td>Graduate</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td><strong>Body mass index</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤18.5 (underweight)</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>18.6-24.9 (normal)</td>
<td>28</td>
<td>31</td>
</tr>
<tr>
<td>25-29.9 (overweight)</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td>≥30 (obesity)</td>
<td>28</td>
<td>31</td>
</tr>
<tr>
<td><strong>Hemoglobin A1C</strong> (average blood sugar levels)</td>
<td></td>
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<tr>
<td>&lt;5.4 (normal)</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>5.5-5.9 (high)</td>
<td>52</td>
<td>58</td>
</tr>
<tr>
<td>&gt;6.0 (very high risk/diabetes)</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td><strong>Plasma glucose level</strong></td>
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<tr>
<td>≤99 mg/dL (normal)</td>
<td>82</td>
<td>91</td>
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<tr>
<td>100-125 mg/dL (prediabetes; impaired fasting glucose)</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>≥126 mg/dL (diabetes)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total cholesterol</strong></td>
<td></td>
<td></td>
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<tr>
<td>&lt;200 mg/dL (desirable)</td>
<td>76</td>
<td>85</td>
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<tr>
<td>200-239 mg/dL (borderline high)</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>≥240 mg/dL (high)</td>
<td>2</td>
<td>2</td>
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<tr>
<td><strong>Low-density lipoprotein cholesterol</strong></td>
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<td></td>
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<tr>
<td>&lt;100 mg/dL (optimal)</td>
<td>54</td>
<td>60</td>
</tr>
<tr>
<td>100-129 mg/dL (near optimal/above optimal)</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>130-189 mg/dL (borderline high/high)</td>
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<td>16</td>
</tr>
<tr>
<td><strong>High-density lipoprotein cholesterol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤40 mg/dL (a major risk factor for heart disease)</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>40-59 mg/dL (the higher your HDL, the better)</td>
<td>53</td>
<td>59</td>
</tr>
<tr>
<td>≥60 mg/dL and above (considered protective against heart disease)</td>
<td>30</td>
<td>33</td>
</tr>
<tr>
<td><strong>Triglycerides (Adult Treatment Panel III levels)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤150 mg/dL (normal)</td>
<td>84</td>
<td>93</td>
</tr>
<tr>
<td>150-199 mg/dL (borderline high)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>200-499 mg/dL (high)</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td><strong>Systolic blood pressure, mm Hg</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;120 (normal)</td>
<td>71</td>
<td>82</td>
</tr>
<tr>
<td>120-139/140-159 (prehypertension or stage I hypertension)</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td><strong>Diastolic blood pressure, mm Hg</strong></td>
<td></td>
<td></td>
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<tr>
<td>&lt;80 (normal)</td>
<td>73</td>
<td>84</td>
</tr>
<tr>
<td>80-89/90-99 (prehypertension or stage I hypertension)</td>
<td>14</td>
<td>16</td>
</tr>
</tbody>
</table>

*Sample might not add up to 91 due to nonresponse to certain questions.*
Questionnaire Scores

The results of the assessment were sent to each participant in a summarized form by mail 16 weeks post CVD assessment. During the assessment process, if there was a significant abnormality that placed the participant at increased risk for sudden cardiac death or other health problem, he or she was referred to a local cardiologist or appropriate medical doctor for a full and comprehensive evaluation. In addition, their primary care physician was notified. Based on the assessments, none of the participants were referred to outside doctors.

DISCUSSION

The current study reports findings from a cardiovascular health screening program (Rams Have Heart) that was conducted in an HBCU setting. BMI, HbA1c, plasma glucose level, total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, triglycerides (Adult Treatment Panel III levels), and systolic and diastolic blood pressure cutoffs were similar to those of the third report by the expert panel of detection, evaluation, and treatment of high blood cholesterol and other studies. The prevalence for BMI (overweight or obese) was 63% (n = 58) among men and women. More women than men were either overweight or obese (data not shown). These 2 findings were similar to those of Owens, who found that African American young adults disproportionately have high rates of obesity and type 2 diabetes compared to non-Hispanic and white young adults, and the research of Brown et al that revealed that 55% of African American women aged 18 to 40 years enrolled in an HBCU in the south had increased BMI. In addition, our findings for BMI (overweight and obese) for men (72%) and women (71%) are similar to those of Gross et al, who found men to more likely have a higher average BMI than women.

Furthermore, HbA1c levels for the study sample were elevated, with 66% of the students having blood levels consistent with having diabetes or being at high risk of developing the disease. Since a 2-hour glucose tolerance test preparation was not administered prior to HbA1c measurement, other factors might have had an impact on this figure. For example, some students were already overweight or obese, had a family history of diabetes, or were adjusting to college life. Another major contributor to poor health outcomes is socioeconomic status.

While students were not asked questions on their income, a majority of them came from lower socioeconomic status, a population commonly served by HBCUs. Further, nearly 10% of the students were aged 40 years or more. This was due to older adults returning to college, especially in the nursing and allied health fields.

Among those students who were overweight/obese (n = 57), 6 were aged 24 years or less and had elevated HbA1c (5.5-5.9 mg/dL) and total cholesterol 200 mg/dL or greater. One student aged 30 years or greater had HbA1c greater than 6.0, which is considered to be high risk for getting diabetes, and a total cholesterol of 240 mg/dL or greater. In addition, 2 students with HbA1c between 5.5 and 5.9 mg/dL were also prediabetic (100-125 mg/dL). These associations, including high obesity, HbA1c, and cholesterol rates, have also been observed by other researchers.

Three students aged 19 years or less were either prehypertensive or at stage I hypertension for diastolic and systolic blood pressure. These scenarios were also observed in 1 student, who was between 25 and 29 years, and 5 students aged 30 years or greater respectively. However, 3 students aged 30 years or greater and obese were also either prehypertensive or at stage I hypertension for diastolic and systolic blood pressure. These findings point to an increasing number of young minority students who have high average blood sugar levels and also suffer from prehypertension or are at stage I hypertension. Also, the likelihood of being overweight or obese, having high HbA1c, and being prehypertensive or at stage I for diastolic and systolic blood pressure was observed. Therefore, to improve health among minority students in an HBCU, various interventions need to be considered that will teach, encourage, and emphasize the need for students to take responsibility for engaging in physical activity. First, HBCUs should use student health services to develop programs that target the reduction of CVD risk factors. Campus fitness centers are present on most HBCU campuses and provide activities that focus on learning to be fit, and how to achieve fitness goals and healthy lifestyle behaviors.

Second, basic lab testing for chronic diseases such as CVD and diabetes should be implemented in schools so that students who may be predisposed to certain chronic illnesses can be identified early on. Early detection, screening, and close monitoring of student health could produce significant baseline data that could be used for

<table>
<thead>
<tr>
<th>Table 2. Body Mass Index Stratified by Age</th>
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<tbody>
<tr>
<td><strong>Body Mass Index</strong></td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>≤18.5 (underweight)</td>
</tr>
<tr>
<td>18.6-24.9 (normal)</td>
</tr>
<tr>
<td>25-29.9 (overweight)</td>
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<tr>
<td>≥30 (obesity)</td>
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</tbody>
</table>
a longitudinal cohort study that would follow these students from enrollment through graduation. Longitudinal data could guide the development of future interventions that address minority college students’ health.

Finally, university officials and administrators, along with health prevention specialists, could help address health issues among college students by meeting national health goals targeted towards eliminating health disparities through effective campus programs. WSSU has chosen a proactive stance to address this issue by developing an experiential learning curriculum on how to manage and control certain chronic diseases affecting minority students.

LIMITATIONS
This study had several limitations. The study sample was obtained from HBCU students and therefore it was difficult to compare our findings to other universities, which are predominantly white. Another limitation is that this was a cross-sectional study with the sample size from a single university in the southeastern region of the United States. Therefore, the findings cannot be generalized to HBCUs in other parts of the country. A concern that we acknowledge is our failure to administer a 2-hour glucose tolerance test preparation to students whose HbA1c values indicated they were at high risk (58% [n = 52]) or very high risk (5% [n = 4]) of developing diabetes, or had diabetes (3% [n = 3]). It was not very clear if these high levels for HbA1c were due to how the body metabolizes sugar.

CONCLUSION
A major implication of this study is that risk factors for CVD were prevalent among a majority of students. Sedentary lifestyle, overweight, and obesity stand out as key CVD risk factors that negatively impact the health of students on our campus. If left undetected, these risk factors can lead to serious chronic diseases. Students need to understand health, health behaviors, and lifestyle choices as well as develop the self-efficacy needed to undertake the behavioral changes that can improve their health outcomes. In general, the findings of this study suggest that there is a great need for interventions to help African American young adults understand CVD risk factors and the impact they have on their future health. Interventions need to be designed that take into account the cultural influences of this population. For example, universities can integrate culturally appropriate interventions into their school curriculum and the provision of health care (information and preventive care) through campus student health clinics. Administrators can incorporate health and wellness on their campus as part of their strategic plan.

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The Females Against Cancer Educational Series: A Qualitative Evaluation of Mother/Daughter Knowledge and Perceptions of Human Papillomavirus and Its Related Cancers

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INTRODUCTION

Sexual activity and cancer have been linked in numerous studies. Over the past several decades, research has evidenced that viral infections, specifically those transmitted sexually, can lead to cancer. According to the American Cancer Society (ACS), the human papillomavirus (HPV) has been the most important and commonly studied sexually transmitted viral infection identified as a cause of cancer. Many studies have linked persistent high-risk HPV with the most common types of invasive cervical cancer; other strains of the virus cause less serious health challenges or none at all. Approximately 20 million Americans are currently infected with the more than 40 genital tract types of HPV. HPV is commonly spread through genital contact, often during vaginal and anal sex. However, HPV is also spread through oral sex, leading to infection in the mouth and throat area as well. Currently, it is projected that at least one half of all sexually active Americans will contract HPV in their lifetime. Most infected people will not realize they have HPV because they will not develop symptoms or experience related health complications from it. In fact, many times, the body’s immune system clears HPV within 2 years, through natural processes. However, HPV does not clear naturally, the risk for cervical cancer may be increased.

In 2011, the ACS estimated that 12,710 new cases of invasive cervical cancer will occur and approximately 4,290 will die from cervical cancer. In South Carolina, there were an estimated 170 new cases of cervical cancer and 60 deaths due to the disease. South Carolina is ranked 14th in the nation for both incidence and mortality of cervical cancer. Additionally, there is great disparity between those racially classified as white or black, whereas 7.5 per 100,000 whites are newly diagnosed with cervical cancer vs 11.5 per 100,000 blacks. Furthermore, whites die of cervical cancer at a rate of 1.9 per 100,000 compared to 4.9 per 100,000 among blacks. Corresponding to high rates of reported Pap

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Objective: To evaluate the knowledge, perceptions, and effectiveness of an human papillomavirus (HPV)/cervical cancer education/prevention program.

Methods: Approximately 50 middle and high school girls and their mothers participated in the 7-part educational series. Qualitative pre-evaluations and postevaluations were completed for every session, followed by culminating focus groups with mothers and daughters separately.

Results: Common themes included lack of basic knowledge about HPV and its related cancers. Additionally, mothers and daughters expressed difficulty in communicating with one another about healthy relationships; however, during the focus groups, both mothers and daughters discussed how they had utilized effective communication tools to discuss sensitive topics and make informed decisions together.

Conclusions: Despite recent HPV prevention campaigns, more innovative strategies must be implemented to educate more mothers and daughters of HPV and its dangers. Additionally, in educating communities about HPV and associated cancers, more innovative strategies should be mobilized to trigger discussions regarding protective behaviors against HPV.

Keywords: health disparities ■ cervical cancer ■ sexually transmitted diseases ■ qualitative research ■ children/adolescents


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testing in South Carolina from 2005 to 2008, with rates greater than 84% among women who participated in the Behavioral Risk Factor Surveillance Survey in 2008 (among the highest in the nation during 2008), the incidence of reported cervical cancer began climbing and rose steadily during 2005-2008.

Nationally, recent practices to control and prevent cervical cancer have stressed the need for public health and educational interventions to address low levels of HPV knowledge and to increase uptake of HPV vaccination. Therefore, it is necessary to gain understanding concerning the knowledge, skills, and abilities of communities and individuals in order to adequately implement health promotion programs. Specific to South Carolina, a population-based, random-digit telephone survey was conducted in South Carolina to assess knowledge, behaviors, and attitudes related to HPV and the HPV vaccine in May of 2008. Findings from the survey of 1002 of the eligible 3219 households detail that 99.5% of women had heard about Pap testing, 97.8% had ever had a Pap test, and 95.5% had a Pap test within the past 5 years. Regarding vaccination, of the 169 women who had daughters aged 9 to 18 years, 19.5% reported their daughter had been vaccinated. An additional 52.9% of women who had daughters aged 9 to 18 years who had not been vaccinated responded favorably to being willing to have them vaccinated. Using a scoring system with 19 HPV knowledge-based questions, 53.2% of survey participants scored in the low range (0-9 questions correct). Moreover, those categorized as being of white race scored significantly higher on the HPV knowledge-based questions than those racially categorized as black.

Although this study shows an overall lack of education surrounding HPV and cervical testing, it appears that interest has increased among adolescents in learning more about HPV. This is important because adolescent knowledge of HPV may be best influenced by physicians, health educators, peer groups, and media. Research has demonstrated that young women familiar with HPV have received their information at school, in a doctor’s office, and/or via television. One study conducted among African American adolescents and young women aged 14 to 20 years in South Carolina during January-April 2007 examined the association between HPV infection or vaccination and knowledge, beliefs, and attitudes concerning HPV. Of the 73 young women surveyed and 68 interviewed, 61.1% reported having had a Pap test. The mean score of the Pap Test Knowledge Scale was 2.4 out of 5 items, with 1 participant exclaiming, “I couldn’t tell you what she is looking for when I have a Pap test!” Similarly, a study conducted among 252 adolescent girls in a hospital setting undergoing educational intervention using a protocol developed with adolescent patients found positive results. Using both quantitative and qualitative data collection, researchers discovered that a protocol mixed with pictures, diagrams, key phrases, and author scripts significantly increased knowledge scoring from preintervention visit to the postintervention visit. Findings also demonstrated that adolescent girls wanted more pictures to demonstrate the consequences of infection and were surprised that condoms could not completely prevent HPV acquisition or that antibiotics did not cure HPV.

Additional studies suggest that parents are key to HPV understanding in order to increase levels of vaccination. However, the focus on vaccination may overshadow the educational component of increasing understanding of HPV and cervical cancer. In a randomized intervention study within a cross-sectional survey of parents with 8- to 12-year-olds, half of survey participants received brief information about HPV and the other half was the control group. The half of parents who received brief education scored higher than the control group on the HPV assessment tool. However, there was no significant difference among the 1600 parents surveyed for vaccine acceptability. These studies show that brief, valid, educational workshops and materials can increase knowledge and ultimately may lead to behavior change.

A significant focus of the University of South Carolina/Claflin Center for Excellence in Partnerships, Outreach, Research on Health Disparities and Training was to reduce health disparities in HPV and cervical cancer, particularly among minorities in rural areas of South Carolina. The University of South Carolina/Claflin Center of Excellence and Orangeburg Consolidated School District (OCSD) 5 partnered to create the Females Against Cancer Education Series (FACES) to enhance knowledge about these diseases.

**METHODS**

The principal investigators have successfully conducted research through multiple agencies in South Carolina. As a result, cooperative relationships had been established and maintained with key individuals in various agencies, organizations, and communities in the Orangeburg area. The partnership between the Center of Excellence and the OCSD was plausible because of the established presence and relationship in the community. Key school district employees, parents, and young ladies assisted in determining which strategies were most effective for the local area.

The 7-part series consisted of information sessions for the district’s middle and high school girls and their mothers. Participants attended 4-hour sessions on selected Saturdays from January to April 2010. The interactive sessions highlighted topics such as HPV and its associated cancers; sexually transmitted infections, including HIV; unhealthy relationships; and decision-making skills. Mothers and daughters who attended all sessions were eligible to receive a gift card at the conclusion of the last session in April 2010. Sessions were held at the James E. Clyburn Community Empowerment Center in Orangeburg. The University of South Carolina
institutional review board approved the study.

Participants were recruited through advertising in school organizations and programs, such as parent-teacher-student organization meetings, afterschool club meetings, guidance counselors, and other programs sponsored or endorsed by the district during fall 2009. The eligibility criteria included being a female enrolled in an OCSD 5 middle or high school or being the mother of an OCSD 5 female student. Informed consent and assent were obtained from mothers and daughters; and guidelines for open discussion were reviewed and agreed upon (according to school district and state regulations/mandates) by participants and session presenters.

Two focus groups were held with mothers and daughters after the last session. Evaluation and focus group questions were based on session objectives previously established by the project team and individual presenters. All questions were reviewed by a panel of experts in qualitative research, sexual risk behaviors, and health education to evaluate ease of understanding and to determine if they were worded in a manner that would elicit the responses of interest.

We wanted to assess mother and daughter knowledge of HPV, HPV screening and prevention, and HPV-related cancers and session-specific information. Approximately 50 open-ended evaluation responses were independently coded by one of the investigators and an external researcher (both who have expertise in qualitative research methodology) for the establishment of a code book and interrater reliability; analysis was conducted using NVivo v.8 (NVivo), while closed-ended descriptive questions were summarized using Excel (Microsoft Corp, Redmond, Washington). Interrater reliability was established by a calculating a $k$ statistic of 0.69; disagreements in coding were resolved in discussion.

**RESULTS**

Included in these evaluations were 29 daughter responses and 21 mother responses, as 2 mothers brought 2 of their daughters who were eligible to participate. While the majority of the students were high school students (76%), the remaining girls attended 1 of 2 district middle schools in Orangeburg. The girls ranged from 12 to 19 years of age, with an average age of 16 years; the mothers ranged from 39 to 45 years of age, with an average age of 42 years. All of the participants self-identified as African American.

Written qualitative responses were assigned codes and then linked according to mother/daughter relationship. Initially, we discovered that there was a general lack of in-depth knowledge about HPV. This theme was apparent in mothers and daughters. There were 3 sessions that addressed HPV, prevention, screening, vaccination, and related cancers. These sessions occurred at the beginning and midpoint of the program: Introduction to HPV Signs, Symptoms, and Causes: Our Bodies and Our Cervical Health (session 1); HIV and HPV Prevention (session 4); and Oral Health and Cancers (session 7). Some of the responses that reflect this theme can be found in Box 1.

Additionally, related to the lack of knowledge about HPV, there was also a high level of uncertainty about cancers associated with HPV. HPV-mediated cancers were introduced at the beginning of the program during session 1 but were discussed in greater detail during session 6, Cancers caused by HPV. Participants were specifically asked: “What cancers can HPV cause?” More than 95% of respondents discussed not knowing many details of what cancers were caused by HPV. Some of the responses that reflect this theme can be found in Box 1.

A second theme that arose from participant responses was challenges to open and bidirectional communication. There were 4 sessions that addressed components of communication with family members and significant others that occurred near the beginning, midpoint, and end of the program: Informed Decision Making (session 2); Building Positive Self-esteem (session 3); Legal Aspects and Abuse Issues (session 5); and Developing

| Box 1. General Lack of In-Depth Knowledge About Human Papillomavirus (HPV) |
|-----------------------------|-----------------------------|
| **Session Questions Posed to Group Participants** |
| Illustrative responses      |
| • What is human papillomavirus? |
| • “I don’t know what HPV is.” |
| • “Don’t know” |
| • “A disease” |
| • “I didn’t know about the different types of HPV nor the exact definition of HPV.” |
| • How can HPV affect men? |
| • “I didn’t know it could affect men.” |
| • “I didn’t know men had HPV.” |
| • What cancers can HPV cause? |
| • “I think it causes cervical cancer.” |
| • “I’m uncertain.” |
| • “I’m not sure what cancer is caused from HPV.” |
| • “Maybe mouth cancer?” |
| • “People hear a lot about HPV and cervical cancer but not about other kinds of cancer.” |
Effective Communication Skills (session 6). The responses from mothers were generally skewed towards the inability to connect with their daughters about sensitive issues such as sexual intercourse (Box 2).

The daughters disclosed their thoughts on communicating with their mothers about issues they wished they could discuss. Again, the responses were generally skewed towards an inability to openly talk about sensitive issues that may arise. Some of the adolescent responses that reflect this theme can be found in Box 2.

Upon the conclusion of the final session, 2 final focus groups were conducted separately with mothers and daughters to assess what information was retained and skills that were practiced during the sessions and recommendations for future sessions. The focus groups were conducted according to the strategies recommended by Ulin, Robinson, and Tolley. Both the mothers and daughters were asked about the most memorable sessions and, overwhelmingly, every participant mentioned sessions that specifically discussed HPV and cancers. When asked, “What made those sessions stick out?,” respondents indicated that the session information was presented in an interesting way and they did not know a lot about the information shared prior to the program. When participants were asked, “What do you remember specifically about those sessions?,” each participant was able to share facts from the sessions mentioned. Most mothers indicated that they were able to continue conversations initiated in the sessions, and their daughters participated openly and freely in dialogue. They specifically discussed how communication had improved with their daughters through seizing unique opportunities to discuss in nonthreatening ways sensitive topics such as intercourse, healthy relationships, and the HPV vaccine; and how they were able to engage their daughters in conversation. Some daughters indicated feeling empowered to not engage in unhealthy relationships and had a desire to abstain from sexual relationships, but if they were to engage they would do so responsibly and not prior to discussing with their mothers.

**DISCUSSION**

Despite recent HPV prevention campaigns, more innovative strategies must be utilized to educate mothers and daughters of HPV and its dangers. During our study, we discovered many individuals are still unaware of some of the most basic information surrounding HPV and its related cancers. However, it appears that mothers and daughters felt more comfortable discussing healthy behaviors when they were armed with knowledge and information on the disease. This finding is very similar to those discovered in previous studies such as Mays and colleagues, which indicated that the primary reason that parents declined the HPV vaccine was due to a lack of education regarding risk for infection. Health educators, parents, and others must utilize innovative strategies to engage youth and encourage discussions regarding healthy behavior and healthy lifestyle.

It is important to note some limitations of our study. First, the planning and budget process was intricate. Our staff constantly faced challenges securing a start date due to the hierarchy of the school system and the several chains of command in the approval process. Limited funding and budgetary restraints restricted our ability to enhance outreach strategies to more participants and be of assistance to address transportation and childcare needs for those
involved. There were many communication barriers during the recruitment process. In compliance with OCSD 5 policies, we relied on district staff for flyer distribution and delivery of other print communication to participants. This process immobilized our ability to produce a more generalized study and reach a more diverse population.

Second, before implementation, all agendas, documents, and presentations had to be prescreened by the OCSD 5 comprehensive health education coordinator, which at times led to the purging of pertinent information, data, and statistics before the participants received it.

Third, we had to ensure that our presenters had the capability to communicate effectively with all of the participants because of the generational and sometimes educational differences in the group. As the sessions proceeded, attrition was a challenge (despite reminder phone calls during the week preceding a session) that affected data collection over time.

Going forward, it will be important for health educators to conduct more outreach activities that equip members of the community with information and skills that lead to healthy lifestyles and behaviors. For youth especially, one of those healthy behaviors is having the ability to have open and honest conversations about their well-being with peers and parents. This study specifically prioritized African American females, due to the disparities in HPV observed in South Carolina, making the results nongeneralizable in other populations. In order to reduce the incidence of HPV and HPV-mediated cancers, it will be imperative to have collaborative partnerships among educators, parents, and health care providers.

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REFERENCES

Renal Allograft Capsular Repair Surgical Technique to Reduce Allograft Discard Rates of Kidneys With Capsular Injury

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Keywords: kidney transplantation


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BACKGROUND

The number of patients with end-stage renal disease (ESRD) actively waiting for kidney transplants is ever increasing and is around 93 900, according to the current 2011 US Organ Procurement and Transplantation Network and the Scientific Registry of Transplant Recipients annual report.1 There was a 6.1% decrease in living kidney donations1 between 2006 and 2007. During the same period, there was a 1.3% decrease from deceased donors. The number of kidneys recovered but not used for transplantation increased from 14.9% to 16.6% in 2007. This lack of utilization is likely to have a larger impact on African American and other racial/ethnic minority populations, given the relative lack of living donors in those populations as well as a greater need for kidney transplantation in African American populations due to increased incidence of kidney disease.1,2 Because of the known shortage of kidneys available for transplantation and in recognition of the prolonged waiting times for transplantation, especially in African Americans with ESRD,3 we review surgical techniques for increased utilization of procured kidneys with capsular damage and to limit the discard rates of allografts with procurement capsular damage. We believe that increased utilization of kidneys with capsular damage, which previously may have been discarded, will help reduce the impact of shortage of kidneys for transplantation and thereby reduce health disparities and disproportionate waiting times, especially for African American patients with ESRD.1

RACIAL DISPARITIES AND END-STAGE RENAL DISEASE

African American, Native American, and other minority populations are disproportionately affected by ESRD. Despite making up only 12.6% of the US population, African Americans account for nearly 30% of all patients treated for ESRD. Most at risk are African American patients aged 20 to 44 years, who were 20 times likely than Caucasian counterparts to have hypertension-related kidney failure.1,2 In considering kidney transplantation, the problem of ESRD in African Americans is magnified, as there are reported delays in initial referral for transplantation, delays in completion of pretransplant evaluation, disparities in organ allocation necessitating prolonged times on waiting lists, and disparities in outcome following transplantation. Additionally, there are increased incidence of delayed graft function, noncompliance, and ineffective immunosuppressive therapy, resulting in poorer graft survivals post transplantation in African Americans.1,2

EXPANDING THE DONOR POOL

Extended-criteria donors and kidneys procured after cardiac death are ways to expand the donor pool. For example, the anatomical example of the significance of pediatric en bloc4 and dual kidneys ensure good anatomical paradigm of the utilization of the organs from deceased donors.1 In addition, selective use of kidneys with surgical damage would help in optimal utilization of this scarce resource. We present 2 cases in which we salvaged and transplanted kidneys with significant capsular injuries, and we detail the surgical techniques whereby these kidneys were salvaged rather than being discarded.

CASE 1

Renal Capsular Repair

A 49-year-old African American male was admitted for a deceased-donor kidney transplant. He was of the Jehovah’s Witness faith and expressed his wish against blood transfusion. He was on peritoneal dialysis.
Consequently, our transplant center was offered—by an outside procurement agency from a neighboring state—a kidney from a 45-year-old deceased donor. The cold ischemia time was 18 hours. The stated reason as to why the kidney was refused by the local transplant centers was due to 2 arteries and capsular damage. We accepted the kidney with anatomical waivers. While benching the allograft, we noted more than two-thirds of anterior surface of the kidney was devoid of capsule. The allograft otherwise looked fine, with 2 renal arteries and 1 vein. We decided to reinforce the renal parenchyma with Vicryl mesh to cover the capsular defect, which would act as a replacement of the capsule (Figure). The Vicryl mesh was trimmed to match the size of the defect. The edges were sutured to the capsule with 3-0 chromic cat-gut sutures. The kidney was then successfully transplanted. With the release of clamps and beginning of perfusion, there was no bleeding from the renal parenchyma. In addition, looking long-term, we anticipate that the mesh will promote good scarring, which will reduce the chance of postoperative hemorrhage, especially in the event of a needed posttransplant biopsy. The patient had an uneventful postoperative recovery with good graft function and was discharged on postoperative day 5.

CASE 2

Dexon Mesh

A 54-year-old, type O–mismatch kidney was imported for a 63-year-old African American dialysis dependent female waiting 5 years for a deceased-donor kidney transplant. During the bench preparation of the kidney, it was evident that a relatively large separation of the thin renal capsule on the posterior surface existed, likely from a subcapsular hematoma. The kidney had a single renal artery, vein, and ureter, which were anastomosed in the standard fashion to the external iliac artery, vein, and bladder. Upon revascularization, it became evident that the persistent bleeding was coming from the posterior surface of the transplant kidney, and direct examination of the posterior surface of the kidney revealed that the capsule was shredded exposing large areas of renal parenchyma. Several attempts to control the bleeding with electrocautery, argon beam laser, and direct pressure were unsuccessful; more than 2 units of blood loss was measured. As a rescue attempt, the posterior renal surface was covered with Floseal (Baxter, Deerfield, Illinois) and a 6-cm sheet of Fibrillar (Ethicon, Sommerville, New Jersey). The entire kidney was wrapped with a sheet of Dexon (polyglycolic acid) mesh (Covidien, Mansfield, Massachusetts), which was sutured closed at the level of the renal hilum with several 3-0 Vicryl sutures. The kidney was further wrapped with a laparotomy sponge, and hand pressure was applied for 30 minutes. After removal of the sponge, the renal surface remained hemostatic.

DISCUSSION

In deceased-donor kidney transplantation surgery, capsular injury usually happens during procurement. In the setting of multiorgan retrieval, kidneys are the last of the organs to be recovered. Capsular injury can happen while releasing the superior and superior lateral attachments of the kidney. Entering a false plane during retroperitoneal dissection as well as while defatting the kidney during benching preparation may also result in

Figure. Capsular Defected Surgically Covered With Coated Vicryl Plus Antibacterial (Polyglactin 910) Sutures (Ethicon Inc, 2009-2011, a Johnson & Johnson Co.)
capsular injury. Sometimes, the capsular injury may not be obvious until it becomes evident with the development of brisk subcapsular hematoma following implantation, when vascular clamps are released and renal allograft blood flow is reestablished (case 2).

Capsular injury can also happen during live-donor nephrectomy. The injury can occur during extraction of the kidney by end catch bag. Mohamed et al described 1 such case of capsular injury with parenchymal transection, successfully repaired and transplanted.\(^\text{6-7}\)

A minor degree of capsular disruption of the allograft is unlikely to have any major impact upon graft function and complication rates. Capsular disruption, when significant, however, may make transplantation of such an allograft unfavorable. This may lead to nonacceptance of the allograft by the transplant surgeon given the potential risk of major intraoperative and/or postoperative hemorrhage. Rarely, diffuse urine leak can occur from the denuded renal parenchyma.\(^\text{8}\) Reinforcing the denuded capsule with Vicryl mesh with or without Evicel fibrin sealant, if additionally needed, is a simple technique that will avoid these potential complications and consequently increase the available pool of kidney allografts for transplantation.

**CONCLUSIONS**

Capsular injury to the kidneys during procurement can be a cause for discarding procured kidneys. Using reinforcement with Vicryl mesh, the capsular defect can effectively be repaired with excellent outcome. The literature also reveals the possibility of capsular injury occurring during live-donor nephrectomy. Repairing and using deceased-donor and living-donor kidneys with significant capsular tears and disruptions results in effective utilization of the donor pool. As such, utilization of these kidneys will have a positive impact on increasing the available donor pool, which will help the ESRD patients waiting for kidney transplant, especially the African Americans and other minority populations who wait disproportionately prolonged waiting times.

**REFERENCES**

Enterotomy is a significant complication of laparoscopic ventral or incisional hernia repair (LVHR) and can be devastating if missed. Enterotomy occurs in 2.6% of patients undergoing LVHR and is missed 21.8% of the time. Controversy exists regarding the management of known or potential enterotomies. Approaches for managing recognized enterotomies during hernia repair are usually employed immediately: in a nonstaged fashion; and include laparoscopic enterotomy repair with immediate LVHR, laparotomy for repair of enterotomy with concomitant LVHR, or conversion to laparotomy for both enterotomy and hernia repair. The staged approach for managing recognized or potential enterotomies is less commonly employed and involves laparoscopic repair of enterotomy, admission, and delayed but definitive laparoscopic hernia repair in the same hospitalization. The presence of known or potential enterotomies during LVHR presents a difficult problem and may be a contraindication for immediate placement of prosthetic because of increased risks posed for abdominal infection, reoperation, prosthetic removal, hernia recurrence, and death. The staged approach—with a 2- to 5-day delay—represents a safe solution to this challenging problem. We present 4 cases managed via staged approach due to an enterotomy, risk factors, and suspicion for missed or delayed enterotomies augmented by a review of the literature.

Keywords: hernia ■ enterotomy ■ laparoscopy ■ hernia ■ prosthetics


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INTRODUCTION

Laparoscopic ventral and incisional hernia repair (LVHR) is relatively safe and effective. With increasing evidence of its superior outcome in comparison with the open procedure, it has seen greater use and acceptance throughout the world. Enterotomies, defined here as those occurring during LVHR, are significant complications of LVHR and can be devastating if missed. Even in the hands of an experienced surgeon or with the use of prudent surgical techniques, inadvertent enterotomies may occur. Enterotomies are usually due to extensive lysis of adhesions (LOA), dense bowel adhesions, abdominal distortion by significant pneumoperitoneum, pieces of previously placed sutures growing into the intestinal wall, chronic obstruction, and incarceration. Enterotomies have been reported1-3 to occur in 1% to 2% of patients undergoing LVHR and are missed in 18% to 22% of such cases.1 A previous literature review reported that the overall mortality rate of LVHR is 0.05% but, if an enterotomy occurs, the mortality rate increases1 to 2.8%. When an enterotomy is missed, the mortality rate becomes about 4.5 times more than that of a recognized enterotomy.1 Most enterotomies are recognized, but they have devastating consequences if missed, including deaths.4-8

Our goal is to minimize complications arising from LVHR in the presence of an enterotomy while maintaining the superior benefits of a laparoscopic procedure. Controversy regarding management exists, and little has been published to date, regarding whether conversion immediately to the open approach or continuation laparoscopically is preferable as well as to whether or not mesh can be inserted at the time of the initial operation. The presence of known or potential enterotomies during LVHR presents a difficult problem and may be a contraindication for immediate placement of a prosthetic because such a situation poses an increased risk of abdominal wall infection, reoperation, prosthetic removal, enterocutaneous fistulae, hernia recurrence, and death. The staged approach represents an alternative and feasible solution to this challenging problem.

CASE SERIES

Case 1

A 59-year-old female with a body mass index (BMI) of 26.6 kg/m² presented with a history of hysterectomy in 1982 as well as a perforated diverticulitis, which had lead
to a Hartmann procedure in 2001 and was reversed a year later. Five months after her reversal, she developed progressively enlarging hernias at her umbilicus and ostomy reversal site. She had increasing pain and recurrent bowel obstructions. Desiring repair of her hernias, she presented to us in February 2005. After preoperative tests, she was scheduled for ambulatory LVHR. Intraoperatively, multiple dense adhesions were noted both to the midline abdominal incision and the previous ostomy site. The small intestine was adherent and incarcerated into the previous ostomy site. In the course of adhesiolysis, several loops of bowels were deserosalized. Several pieces of prolene suture, noted at both the ostomy and midline incision site, were integrated into the intestine. Despite the fact that no frank enterotomies were found on visual inspection of the intestines, we were concerned that there might be microscopic leakage at the sites where the suture seemed to go directly into the intestine or that there might be microscopic leakage due to extensive LOA for about 3 hours or delayed enterotomy due to deserosalization of the intestines during LOA. It was deemed not prudent to place a prosthetic immediately but rather to do a staged procedure. She was placed on antibiotics postoperatively. Four days later, the second stage was performed with definitive repair of the hernia and placement of a prosthetic. She had an uncomplicated postoperative course and was discharged on day 2 following the staged procedure. No enterotomies were found at the second surgery.

**Case 2**

A 55-year-old male with a BMI of 41.0 kg/m² presented with a history of ulcerative colitis for which he underwent a total colectomy with ileostomy in 2002, a total proctectomy with J-pouch ileal anastomosis and diverting loop ileostomy in 2005, and a take down of the diverting ileostomy 3 months later. He presented for surgery in January 2006 with a very large recurrent incarcerated ventral hernia that he wished to have repaired. After preoperative tests, he was scheduled for ambulatory LVHR. Intraoperatively, we had difficulty gaining access into the abdomen. The initial attempt at accessing the abdominal cavity was at the left upper quadrant, where the use of the Veress needle x1, the open Hasson approach x1, and an optiview trocar were all unsuccessful due to dense intra-abdominal adhesions at these sites. We gained access via an open Hasson approach in the right subcostal region. Once in the abdominal cavity, there were extensive adhesions that required LOA in order to accommodate placement of additional trocars. There were not extensive adhesions to the abdominal wall between loops of small intestine. The large ventral hernia had multiple off-shoots into which small bowel was incarcerated and, using meticulous sharp dissection, these loops of bowel were each safely taken down. LOA took over 4 hours. Given the substantial time involved in LOA, we decided to defer prosthetic placement because of the possibility of a delayed injury or inadvertent enterotomy. On postoperative day 1, the patient developed abdominal distention and vomiting, which was resolved by placement of a nasogastric tube. On postoperative day 5, the second stage was performed. No evidence of bowel content spillage or infection was noted. A definitive hernia repair with placement of prosthetic was done. He was discharged on postoperative day 4 without complications. This patient only received perioperative antibiotics.

**Case 3**

An 81-year-old female with a BMI of 24.9 kg/m² presented with a history of esophageal perforation and transhiatal hernia repair. She had developed an incisional hernia, which was repaired with prosthetic placement at an outside hospital. She presented in December of 2007 with a recurrent incisional hernia. Following evaluation and preoperative tests, she was scheduled for ambulatory LVHR. Intraoperatively, extensive LOA, which took nearly 3 hours, was performed in an attempt to free the stomach out of the incarcerated defect. The stomach had grown into the previously placed prosthetic. Counter traction, sharp dissection, the harmonic scalpel, and bipolar cautery were used judiciously in an attempt to peel the grown-in mesh off the stomach. Given the tenacity and dense nature of the adhesions coupled with the difficulty involved with freeing the mesh from the stomach, we were concerned that there might have been an enterotomy. We assessed for leaks prior to prosthetic placement. Methylene blue was placed, via nasogastric tube into the stomach as the distal stomach was occluded with a pair of atrumatic bowel clamps. One leak was identified on the stomach. Intracorporeal suturing was employed to repair the gastrostomy in a single layer. We deferred prosthetic placement because there had been leakage of gastric contents. Five days later, the second stage was performed with repair of the hernia and placement of a prosthetic. The postoperative course was uncomplicated, except for a urinary tract infection (UTI) on postoperative day 2 following the staged procedure for which she was sent home with trimethoprim/sulfamethoxazole 500 mg twice daily for 7 days. She was discharged on postoperative day 3 in stable condition. There was no evidence at the second operation that the repaired enterotomy had broken down. This patient had been on perioperative antibiotics; due to her urinary tract infection, she also was discharged on oral antibiotics.

**Case 4**

A 75-year-old female with a BMI of 25.7 kg/m² with a history of a hysterectomy with bilateral salpingo-oophorectomy and partial colectomy in 1990 presented with a large incisional hernia in December 2008. Following evaluation and preoperative tests, she was scheduled for ambulatory LVHR. Intraoperatively—on the former midline incision above and below the umbilicus—we encountered multiple dense adhesions, which required extensive adhesiolysis.
Upon completion of adhesiolysis, there was significant pneumoperitoneum that had tracked between the rectus sheath and abdominal wall, thus distorting the abdomen. With this, along with the fact that it had been a difficult dissection, with more than 3 hours of LOA in addition to concern for a microscopic bowel leak, we decided to perform a staged procedure. Postoperatively, she was given an intravenous dose of 1 g of cefoxitin for infection prophylaxis, and, 2 days later, the second stage was performed with repair of the hernia and placement of prosthetic. Another intravenous dose of 1 g of cefoxitin was administered following the second stage. She had an uncomplicated postoperative course, except for atrial flutter on postoperative day 2 following the staged procedure. This resolved on postoperative day 5 when she was discharged.

METHODS

A search of the English-language literature was conducted on PubMed using the terms staged laparoscopic hernia repair, laparoscopic ventral and incisional hernia repair, and laparoscopy and enterotomy alone and in combinations. We also searched the reference list of some articles identified by the search strategy used. Of the articles that we found, those included met the following criteria: the authors clearly stated the number of enterotomies, indicated whether enterotomies were initially recognized or missed, reported on the method used for managing these enterotomies, staged or nonstaged approach, and reported outcomes for each of the approaches. For analysis, only the most recent article of any single author was included if it appeared that the series had been previously reported with the same patient cohorts.

For the purpose of this research, we defined enterotomy as any serosal or transmural penetration or injuries of the gastrointestinal tract that required immediate or subsequent suture repair either laparoscopically or via a laparotomy. An analysis was made to determine the total number of patients who underwent LVHR. Then, the total number of enterotomies was recorded and the method or mechanism of injury leading to these enterotomies was evaluated and recorded. Enterotomies were then divided into those recognized and those missed at the initial operation. The repair of both the enterotomy and hernia was also evaluated and classified either as nonstaged or staged, and the outcomes, including morbidity and mortality, for each approach were determined.

For the case series, we searched our retrospective LVHR database: patients presenting to a single surgeon at an inner-city tertiary care facility in the mid-Atlantic region of the United States with ventral or incisional hernia were offered a laparoscopic approach. Prior to obtaining informed consents, the risks associated with LVHR—including the possibility of an enterotomy requiring a staged procedure—were explained, including the possibility of an enterotomy requiring a staged procedure. Surgical techniques followed previously published reports: the patient was positioned supine on the operating room table, an ioban was placed, and the abdomen was accessed with a Veress needle remote from the site of any previous operations. Additional ports were placed, and sharp adhesiolysis was performed. No drains were placed. These patients had planned returns—at which point any enterotomies would be directly identified—to the operating room. The decision to perform a staged LVHR was made intraoperatively. Once the decision was made to stage the procedure, adhesiolysis was completed, trocars removed, carbon dioxide evacuated, and trocar sites closed. No drains were used. Patients were admitted to the hospital. Physical examination, white blood cell count, temperature curve, and hemodynamics were used for serial assessment of any delayed or missed bowel injury. Patients were returned to the operating room for the second stage within 2 to 5 days postoperatively. The timing of return to the operating room was based on clinical factors, including demonstration of fever, elevated white blood cell count, and clinical examination.

When the patients were returned to the operating room for placement of prosthetic, access to the abdominal cavity was gained via blunt technique through previous trocar sites. Because laparoscopy causes few adhesions, minimal new adhesions had formed since the initial surgery. These were easily lysed and would not likely have been further diminished with placement of an antiadhesion barrier at the first surgery. The hernia defect was measured. The prosthetic was selected to provide at least 5 cm of overlap over the edges of the hernia defect. Then the prosthetic was labeled in all 4 quadrants numerically and sutures placed in the 4 corners, following which the prosthetic was rolled and placed into the abdomen through the center trocar. The sutures were then fixed through all fascia layers using a suture passer through small stab wounds. A tacking device was used to secure the mesh along its outer edge up the abdominal wall, leaving gaps of 0.5 to 1 cm circumferentially. The trocars were removed and the abdomen was closed after desufflation. Postoperative management was as in a routine LVHR.

RESULTS

The results (Table 1) include all studies that were identified through the literature review described earlier. The incidence of inadvertent enterotomy in 2996 patients undergoing LVHR was determined to be 2.6% (95% CI, 2%-3%), \( p = .005 \). Of all enterotomies, 78.2% (61 of 78) were recognized at the time of the initial operation; of note is that this finding represents an incidence of 2.0% of the total number of patients undergoing LVHR. It is important to report that of all enterotomies, 21.8% (17 of 78) were missed at the time of initial operation, which represents an overall incidence of missed enterotomy of 0.57% in 2996 patients. Even more important and unfortunate is that the mortality rate in our review was 6.4%, resulting in an overall mortality of 0.2% for patients undergoing LVHR. It is
**Table 1.** Staged Laparoscopic Ventral and/or Incisional Hernia Repair in the Face of Enterotomies Sustained During Laparoscopic Ventral and/or Incisional Hernia Repair in the Literature

<table>
<thead>
<tr>
<th>Reference</th>
<th>N (%)</th>
<th>MOI</th>
<th>R (%)</th>
<th>M (%)</th>
<th>S (%)</th>
<th>Outcome of Staged</th>
<th>NS (%)</th>
<th>Outcome of Nonstaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heniford²</td>
<td>10/819 (1.22)</td>
<td>LOA</td>
<td>9 (1.09)</td>
<td>1 (0.12)</td>
<td>4 (0.49)</td>
<td>1 recurred without infection, 3 uneventful</td>
<td>6 (0.73)</td>
<td>1 requiring 18 day hospital stay (missed enterotomy)</td>
</tr>
<tr>
<td>Berger⁴</td>
<td>4/150 (2.67)</td>
<td>Thermal injury, LOA</td>
<td>3 (2)</td>
<td>1 (0.67)</td>
<td>1 (0.67)</td>
<td>Uneventful</td>
<td>3 (2)</td>
<td>2 mesh removal (abdominal abscess and infection)</td>
</tr>
<tr>
<td>Salameh⁵</td>
<td>2/60 (3.33)</td>
<td>Learning curve</td>
<td>1 (1.67)</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>1 death (missed enterotomy)</td>
</tr>
<tr>
<td>Perrone⁶</td>
<td>4/116 (3.45)</td>
<td>LOA, trocar insertion</td>
<td>2 (1.72)</td>
<td>2 (1.72)</td>
<td>1 (0.86)</td>
<td>Uneventful</td>
<td>3 (2.59)</td>
<td>1 death (missed enterotomy)</td>
</tr>
<tr>
<td>Koehler⁷</td>
<td>2/15 (13.33)</td>
<td>LOA</td>
<td>0</td>
<td>2 (13.33)</td>
<td>0</td>
<td></td>
<td></td>
<td>1 recurrence (missed enterotomy)</td>
</tr>
<tr>
<td>Egea⁸</td>
<td>4/90 (4.44)</td>
<td>Block reduction of visceral contents in hernia sac</td>
<td>3 (3.33)</td>
<td>1 (1.11)</td>
<td>0</td>
<td></td>
<td></td>
<td>1 death (missed enterotomy)</td>
</tr>
<tr>
<td>Ben-Haim⁹</td>
<td>6/100 (6)</td>
<td>LOA, learning curve</td>
<td>4 (4)</td>
<td>2 (2)</td>
<td>0</td>
<td></td>
<td>6 (6)</td>
<td>1 mesh removal (suture line leak)</td>
</tr>
<tr>
<td>Chari¹⁰</td>
<td>2/14 (14.29)</td>
<td>Learning curve</td>
<td>2 (14.29)</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td>1 reoperation (missed enterotomy)</td>
</tr>
<tr>
<td>Birch¹¹</td>
<td>2/64 (3.13)</td>
<td>LOA, trocar insertion</td>
<td>2 (3.13)</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td>1 mesh removal (infection)</td>
</tr>
<tr>
<td>Shah¹²</td>
<td>4/112 (3.57)</td>
<td>LOA, reduction of incarcerated bowel, traction</td>
<td>4 (3.57)</td>
<td>0</td>
<td>0</td>
<td></td>
<td>4 (3.57)</td>
<td>1 recurrence (missed enterotomy)</td>
</tr>
<tr>
<td>LeBlanc¹³</td>
<td>1/96 (1.04)</td>
<td>LOA, learning curve</td>
<td>1 (1.04)</td>
<td>0</td>
<td>0</td>
<td></td>
<td>1 (1.04)</td>
<td>Uneventful</td>
</tr>
<tr>
<td>Ramshaw¹⁴</td>
<td>2/79 (2.53)</td>
<td>LOA</td>
<td>1 (1.27)</td>
<td>1 (1.27)</td>
<td>0</td>
<td>2 (2)</td>
<td></td>
<td>1 mesh removal (missed enterotomy)</td>
</tr>
<tr>
<td>Parker¹⁵</td>
<td>2/50 (4)</td>
<td>Endoscopic shears, harmonic scalpel</td>
<td>2 (4)</td>
<td>0</td>
<td>2 (4)</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Bencini¹⁶</td>
<td>6/64 (9.38)</td>
<td>LOA, learning curve</td>
<td>6 (9.38)</td>
<td>0</td>
<td>0</td>
<td></td>
<td>6 (9.38)</td>
<td>Uneventful</td>
</tr>
<tr>
<td>Rosen¹⁷</td>
<td>2/114 (1.75)</td>
<td>LOA, serosal injury</td>
<td>2 (1.75)</td>
<td>0</td>
<td>0</td>
<td></td>
<td>2 (1.75)</td>
<td>Uneventful</td>
</tr>
</tbody>
</table>
critical to note that all deaths (5 cases) are as a result of missed enterotomies which, from literature review, are associated with the nonstaged procedures (Table 2). Hence, the mortality in patients with missed enterotomy alone is significant, 29.4% (5 of 17), as opposed to 0% (0 of 61) in patients whose enterotomies were recognized during the initial operation. All enterotomies that occurred in patients managed via the staged procedure were recog-

Table 1. Staged Laparoscopic Ventral and/or Incisional Hernia Repair in the Face of Enterotomies Sustained During Laparoscopic Ventral and/or Incisional Hernia Repair in the Literature (cont)

<table>
<thead>
<tr>
<th>Reference</th>
<th>N (%)a</th>
<th>MOI</th>
<th>R (%)</th>
<th>M (%)</th>
<th>S (%)</th>
<th>Outcome of Staged</th>
<th>NS (%)</th>
<th>Outcome of Nonstaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binenbaum18</td>
<td>6/312  (1.92)</td>
<td>LOA, trocar injury</td>
<td>5</td>
<td>1 (0.32)</td>
<td>0</td>
<td>__</td>
<td>6 (1.92)</td>
<td>2 enterocutaneous fistulae</td>
</tr>
<tr>
<td>Ujiki19</td>
<td>1/100 (1)</td>
<td>NR</td>
<td>0</td>
<td>1 (1.03)</td>
<td>0</td>
<td>__</td>
<td>1 (1)</td>
<td>Uneventful</td>
</tr>
<tr>
<td>Olmi20</td>
<td>5/50 (10)</td>
<td>Dissection; bowel loops caught in previous fascial sutures</td>
<td>5 (10)</td>
<td>0</td>
<td>0</td>
<td>__</td>
<td>5 (10)</td>
<td>Uneventful</td>
</tr>
<tr>
<td>Eid21</td>
<td>2/79 (2.53)</td>
<td>LOA, trocar injury</td>
<td>1</td>
<td>1 (1.27)</td>
<td>0</td>
<td>__</td>
<td>2</td>
<td>1 recurrence (missed enterotomy)</td>
</tr>
<tr>
<td>Kyzer22</td>
<td>2/53 (3.77)</td>
<td>LOA, bowel reduction</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>__</td>
<td>2 (3.77)</td>
<td>Uneventful</td>
</tr>
<tr>
<td>Robbins23</td>
<td>1/36 (2.78)</td>
<td>LOA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>__</td>
<td>1</td>
<td>1 abdominal wall infection</td>
</tr>
<tr>
<td>Birgisson24</td>
<td>2/64 (3.15)</td>
<td>LOA</td>
<td>2</td>
<td>0</td>
<td>1 (1.56)</td>
<td>Uneventful</td>
<td>1 (1.56)</td>
<td>Uneventful</td>
</tr>
<tr>
<td>Ferrari25</td>
<td>1/36 (2.78)</td>
<td>LOA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>__</td>
<td>1</td>
<td>Uneventful</td>
</tr>
<tr>
<td>Gananadhaa26</td>
<td>1/71 (1.41)</td>
<td>LOA</td>
<td>1</td>
<td>0</td>
<td>1 (1.41)</td>
<td>Uneventful</td>
<td>0</td>
<td>__</td>
</tr>
<tr>
<td>Barbaros27</td>
<td>1/23 (4.35)</td>
<td>Electrocautery burn</td>
<td>0</td>
<td>1 (4.35)</td>
<td>0</td>
<td>__</td>
<td>1 (4.35)</td>
<td>1 mesh removal (missed enterotomy)</td>
</tr>
<tr>
<td>Frantzides28</td>
<td>2/208 (1)</td>
<td>LOA</td>
<td>0</td>
<td>2 (1)</td>
<td>0</td>
<td>__</td>
<td>2</td>
<td>2 mesh removal (missed enterotomies)</td>
</tr>
<tr>
<td>Holzman29</td>
<td>1/21 (4.8)</td>
<td>LOA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>__</td>
<td>1</td>
<td>Uneventful</td>
</tr>
<tr>
<td>Total all patients</td>
<td>78/2996 (2.6)</td>
<td>LOA = most common cause of enterotomy</td>
<td>61</td>
<td>17/2996 (0.57)</td>
<td>10/2996 (0.3)</td>
<td>68/2996 (2.3)</td>
<td>Mortality: 5/2996 (0.2)</td>
<td></td>
</tr>
<tr>
<td>Total for enterotomies alone</td>
<td>61/78 (78.2)</td>
<td>LOA</td>
<td>17/78 (21.8)</td>
<td>10/78 (12.8)</td>
<td>68/78 (87.2)</td>
<td>Mortality: 5/78 (6.4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: LOA, lysis of adhesion; LVHR, laparoscopic ventral and/or incisional hernia repair; M, missed enterotomy; MOI, mechanism of injury of bowel; R, recognized enterotomy.

a Numerator is the number of enterotomies and denominator is the total number of patients who underwent LVHR.
The method of management of enterotomies (recognized and missed) and the repair of hernias associated with enterotomies are also included on Table 1. The method of hernia repair in the presence of enterotomy (recognized or missed) is classified as either staged or nonstaged. Only those articles that clearly stated the method of management of enterotomies during LVHR were included. The majority of LVHRs in the presence of enterotomy was via the nonstaged approach. Of all patients with enterotomies, 87.2% (68 of 78) underwent the nonstaged approach, which represents 2.3% of all patients undergoing LVHR, while only 12.8% (10 of 78) underwent the staged approach, representing 0.3% of all patients undergoing LVHR in these series. All patients whose enterotomies were missed at the time of the initial operation underwent subsequent procedures that typically involved prosthetic removal, repair of enterotomy, and closure.

Complications associated with either staged or nonstaged LVHR in the presence of enterotomy were examined also (Table 2). Patients undergoing the staged approach have a complication rate of 4% (95% CI, –4%–11.5%), a single recurrence (1 of 25). Patients who underwent the nonstaged approach have a complication of 96% (24 of 25); most of these complications, including all deaths, resulted from missed enterotomies. Of the 17 cases of missed

### Table 2. Staged and Nonstaged Laparoscopic Ventral and Incisional Hernia Repair: Complications and Outcomes

<table>
<thead>
<tr>
<th>Total Enterotomies</th>
<th>Recognized Enterotomies (%)</th>
<th>Missed Enterotomies (%)</th>
<th>Complications (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>61 (78.2)</td>
<td>17 (21.8)</td>
<td>25 (32)</td>
</tr>
<tr>
<td>Staged</td>
<td>10 (16.4)</td>
<td>0 (0)</td>
<td>1/10 (10)</td>
</tr>
<tr>
<td>Nonstaged</td>
<td>51 (83.6)</td>
<td>17 (100)</td>
<td>24/68</td>
</tr>
</tbody>
</table>

13/17 (88.2%) from missed enterotomies
- 5 deaths
- 4 mesh removals
- 2 recurrences
- 1 reoperation
- 1 prolonged hospitalization

11/51 (21.6%) from recognized enterotomies
- 4 mesh removals
- 2 recurrences
- 2 enterocutaneous fistulae
- 1 abdominal wall infection
- 1 reoperation
- 1 prolong hospitalization

Mortality 0 5/17 (29.4)

### Table 3. Mechanism of Injury Leading to Enterotomies

<table>
<thead>
<tr>
<th>Mechanism of Injury</th>
<th>No. of Times Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lysis of adhesion</td>
<td>16</td>
</tr>
<tr>
<td>Dissection (of bowel loops in sutures, incarcerated bowel, hernia sac contents)</td>
<td>4</td>
</tr>
<tr>
<td>Trocar insertion</td>
<td>3</td>
</tr>
<tr>
<td>Learning curve</td>
<td>3</td>
</tr>
<tr>
<td>Thermal source</td>
<td>2</td>
</tr>
<tr>
<td>Endoscopic and harmonic scalpel</td>
<td>1</td>
</tr>
<tr>
<td>Traction</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>

### Table 4. Patient Demographics

<table>
<thead>
<tr>
<th>Patients</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
</tr>
<tr>
<td>Age</td>
<td>67.5 ± 12.5 years (55-81)</td>
</tr>
<tr>
<td>Body mass index</td>
<td>29.6 ± 7.7 kg/m² (24.9-41)</td>
</tr>
<tr>
<td>Previous abdominal surgeries</td>
<td>2.5 ± 0.6 (2-3)</td>
</tr>
<tr>
<td>Recurrent hernia</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>Abdominal defect size</td>
<td>203.3 ± 202.2 cm² (40-494)</td>
</tr>
</tbody>
</table>
enterotomies, 13 had complications (88.2%), including reoperation, recurrence, prosthetic removal, prolonged hospital stay, sepsis, and death. Of the 51 cases of recognized enterotomies in the nonstaged procedure, 11 had complications (21.6%) including reoperation, prosthetic removal, recurrences, enterocutaneous fistulae, abdominal wall infection, and prolonged hospitalization. The occurrence of an enterotomy is an unfortunate event during LVHR, but the most problematic event is the occurrence of a missed or delayed enterotomy, which leads to an unacceptable high degree of complications, including death.

We also found that the most common intraoperative risk factor associated with an enterotomy is the extensive LOA, accounting for more than half of the enterotomies. Seven mechanisms of injuries leading to enterotomies were identified (Table 3). They have the following occurrences: LOA, 53.3% (16 of 30); dissection, 13% (4 of 30); trocar insertion and learning curve, both with 10% each (3 of 30); thermal, 6.6%; and endoscopic shears and traction with 3.3% occurrence each.

In our case series, 4 patients (3 females, 1 male) were treated between February 2005 and December 2008. Patient demographics are described in Table 4. Two of the 4 patients (50%) had a previous ventral hernia repair with prosthetic and were now presenting with recurrence. Patients with recurrence had an average of 2.5 previous repairs (range, 2-3). Two of the patients were overweight, 1 was obese, and the fourth had a BMI within normal limits. The average BMI was 29.6 ± 7.7 kg/m² (range, 24.9-41 kg/m²). All patients were seen in the postoperative setting between 3 and 6 months after surgery, and all were doing well.

Intraoperative findings that influenced the decision to perform a staged procedure are found in Table 5. Extensive LOA lasting more than 3 hours. This is consistent with the literature, which shows that LOA is the most common risk factor for an inadvertent enterotomy during LVHR. An absolute indication for delayed mesh placement was the presence of enterotomy with a high index of suspicion for additional missed or delayed enterotomies, such as the patient in case 3 with a gastrotomy. Extensive LOA, any serosal injury, or pieces of prosthetic growing into the intestinal wall were considered indicators for a possible missed or delayed enterotomy and, thus, used as reason to delay the placement of prosthetic. Additionally, any condition or maneuver that might place bowels at risk for immediate or delayed injury was considered a significant risk factor and a reason to delay prosthetic placement. For instance, multiple unsuccessful attempts at gaining access into the abdominal cavity (1 patient), intestine or stomach adherent (2 patients), and incarcerated into the hernia site (1 patient, respectively), and distortion of the abdomen by pneumoperitoneum (1 patient).

We successfully placed a prosthetic at the second operation in all 4 patients. Table 6 contains perioperative findings. There was an average of 4 days’ (range, 2-5 days) delay between the first and second operations involving placement of the prosthetic and definitive hernia repair. The average size of the abdominal hernia defect was 203.3 ± 202.2 cm² (range, 40-494 cm²). Prosthetics were placed such as to have a 5 cm overlap at the margins; for achieving this, the average size of a prosthetic was determined to be 401.3 ± 140.9 cm² (range, 285-588 cm²).

**DISCUSSION**

Ventral and incisional hernias are common surgical problems and account for more than 100,000 operations in the United States each year. Open repairs of ventral and incisional hernia—despite onlay reinforcement with prosthetic—have yielded subpar results. A recent study of open repair procedures showed recurrence rates of 46% with primary repair and 23% with mesh repairs over a 3-year period. The laparoscopic approach to ventral and incisional hernia repair is designed to have a mechanical

<p>| Table 5. Intraoperative Findings That Influenced the Decision to Perform a Staged Laparoscopic Ventral and Incisional Hernia Repair (Including Risk Factors for Missed and Delayed Enterotomies During Laparoscopic Ventral and Incisional Hernia Repair) |</p>
<table>
<thead>
<tr>
<th>Intraoperative Finding</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensive lysis of adhesion ≥3 hours</td>
<td>4 (100)</td>
</tr>
<tr>
<td>Small intestine adherent and incarcerated into hernia site</td>
<td>2 (50)</td>
</tr>
<tr>
<td>Deserosalized loop of bowels</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Pieces of previously placed prolene sutures growing into intestinal wall</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Stomach adherent into the incarcerated defect</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Multiple unsuccessful attempts at gaining access into abdominal cavity due to adhesions</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Gastrostomy</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Abdominal distortion by significant pneumoperitoneum</td>
<td>1 (25)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 6. Operative Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of defects</td>
</tr>
<tr>
<td>Size of prosthetic</td>
</tr>
<tr>
<td>Delay to placement of prosthetic</td>
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<tr>
<td>Hospital stay</td>
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</tbody>
</table>
advantage, with prosthetic beneath the rectus muscle while avoiding wound complications of larger incisions. Laparoscopic ventral hernia repair has been shown to have fewer wound complications as opposed to open repairs.3,22,29,30

A dreaded, most serious complication of LVHR, however, is the occurrence of an enterotomy. A thorough review of literature has revealed that one of the most common risk factors for enterotomy during LVHR is extensive LOA.

LOA has been described as the rate-limiting step of LVHR.31 Arguably, LOA is the most challenging element encountered during LVHR, especially in patients with previous abdominal surgery.3,7,18,19,32,33 This is due to the fact that patients who have previously undergone laparotomy and open hernia repairs have dense extensive adhesions requiring extensive LOA2,6,7,11,18,35-33 and is supported by autopsy data reporting that extensive adhesions are consistently present in 67% of patients with a previous laparotomy.2 LOA is responsible for well over half of enterotomies, which rationalizes our concern for enterotomies in each of our 4 cases, as these were patients who had previously undergone an average of 2.5 abdominal surgeries (Table 4). Furthermore, comparison has been made between patients undergoing LVHR for the first time with those who had undergone prior abdominal surgery, with the result being that previous abdominal surgery in itself was observed to cause higher incidences of enterotomies. Perrone et al sustained 4 enterotomies out of 116 patients undergoing LVHR. All 4 patients had prior ventral hernia repair with prostheses, with the enterotomy rate being 11.4% for this group compared with 0% in patients undergoing first-time ventral hernia repair2 (p < .01).

In our case series, findings in 2 patients with small intestine that was adherent and incarcerated into the hernia site requiring extensive LOA and use of sharp dissection and electrocautery presented concern for a missed or delayed enterotomy. Delayed enterotomies are often due to latent thermal injuries, and the mechanism is thought to involve the formation of a scab or ischemic tissue as a result of a heat source–initiated localized burn that eventually necroses and falls away, leaving the bowel perforated.1,3,11,34,36 In case 3, we describe the use of methylene blue in detecting an inadvertent gastrostomy. In a case where there is high suspicion for a gastrostomy, consider using methylene blue for detection, hence avoiding missing enterotomies.

A delay in definitive hernia repair in the presence of an enterotomy optimizes bacterial clearance and minimizes the risk of mesh infection. This time delay is very important when there is a high index of suspicion for an enterotomy during LVHR because Aldana et al have shown that laparoscopic surgery produces a delayed immune response to bowel perforations compared to the open approach.27 As a result, the delay in a staged approach allows neutrophils and macrophages to clear peritoneal bacteria, which instigates an activation of the complement cascade and, within a matter of hours, an upregulation of peritoneal mesothelial cell activity.38 Neutrophils modulate macrophage function within 6 to 12 hours post surgery; once this occurs, an intense combat ensues within the peritoneal cavity that is aimed at containment and destruction of the insult.39 This prevents the patient from future complications, including peritoneal sepsis and mesh infection that leads to mesh removal and hernia reoccurrence. In the event of mesh infection, removal is mandatory,4,39 as antibiotic therapy alone usually fails,39 and attempts at salvaging infected prosthetics are mainly unsuccessful. The only reasonable option left is a primary suture repair, which is inferior to a mesh repair30,40 and thus likely to result in hernia recurrence with increased morbidity and mortality. The staged laparoscopic procedure in the event of an inadvertent enterotomy involving major spillage of bowel content has already been encouraged by some authors.1,3,7,9,15,41

In our series, the interval between the LOA and definitive hernia repair with placement of prosthetics was an average of 4 days (range, 2-5 days). (Table 6). The review of the literature indicated that the second stage is usually performed 3 to 5 days postoperatively (average of 3.7 days), which is consistent with our series. Between the first and second stages, time needs to be permitted that is sufficient enough to allow recognition of a missed injury but not so long as to allow reformation of dense adhesions. Missed enterotomies often present within the first 24 to 72 hours, and most patients manifest clinical symptoms of bowel injury, including peritonitis, sepsis, and multiple organ failure within 48 hours. From our experience, a delay of up to 5 days allows reformation of very loose, filmy adhesions that are easily taken down bluntly. Studies have shown that adhesions begin to mature 5 to 7 days after surgical trauma and that by day 7 the main components of the adhesions are collagen and fibroblasts.42 Permanent adhesions are formed as early as 7 days postoperatively.43 While the decision as to when to perform the second procedure involving definitive mesh placement should be strongly guided by clinical factors, our experience, literature review, and the pathogenesis of adhesion formation strongly support a delay of 2 to 5 days. Our recommended approach for management of enterotomies, supported by literature and personal experience, is that an LVHR that is staged represents a safe and efficient solution to a difficult problem.

The timing (immediate or delayed) of prosthesis placement, though controversial, is of paramount importance. A thorough review of the current literature reveals that complications resulting from enterotomies during LVHR are 96% of the time associated with the nonstaged procedure. There is a complication rate of 88.2% (13 of 17) and 21.6% (11 of 51) in patients with missed and recognized enterotomies, respectively, who underwent nonstaged procedures. These findings are important, given the high mortality rate of 29.4% (5 of 17) associated with a missed enterotomy. The overall mortality of LVHR (0.2%) is comparable with that of other laparoscopic procedures. When an enterotomy occurs, however, the mortality increases to 6.4%. The mortality of a missed enterotomy is even higher, 29.4%, almost
5 times higher. This is in comparison with patients who underwent the staged procedure with a complication of only 4%, with 0% mortality. Our recommended approach for management of enterotomies, supported by literature and personal experience, is a staged LVHR, which represents a safe and efficient solution to a difficult problem.

**CONCLUSION**

Delaying mesh placement by doing a staged procedure when faced with frank enterotomies or possessing a rational suspicion of missed or delayed enterotomies during LVHR is viable and feasible. It offers an approach to avoid the myriad complications associated with prosthetic placement in the setting of enterotomies. Primary enterotomy repair and delayed laparoscopic ventral hernia repair should be used for immediate treatment of inadvertent enterotomies sustained during LVHR. It is evident that extensive lysis of hostile adhesions results in a high likelihood of enterotomies, whether frank, missed, or delayed, thus increasing morbidity and mortality in the setting of nonstaged LVHR with prosthetic. The staged approach to LVHR represents a viable, sound, and feasible option when faced with frank enterotomies, extensive lysis of dense adhesions, or the possibility of missed or delayed enterotomies due to deserialization during LOA.

**REFERENCES**


A Case of Malignancy in a Thyroglossal Duct Cyst—Recommendations for Management

Dilip Dan, MBBS, FACS; Rakesh Rambally-MBBS; Vijay Naraynsingh, MBBS, FRCS, FACS; Ravi Maharaj, MBBS, FRCS; Seetharaman Hariharan, MD, FCCM

INTRODUCTION

Thyroglossal duct cysts (TGDCs) represent one of the most common differentials for a congenital midline neck cyst or mass. After diagnosis, this is usually treated by a Sistrunk operation. A well-differentiated carcinoma arising in a TGDC, whilst a rare occurrence, is usually clinically indistinguishable from its benign counterpart and an incidental finding after surgical resection. This is a case report of a papillary TGDC carcinoma for which a Sistrunk procedure, followed by a total thyroidectomy, was performed. This report reviews the current data as published in the world literature and highlights some of the controversies surrounding further management.

CASE REPORT

An 18-year-old obese female presented with a 4×2 cm nontender, firm midline mass in the infrahyoid region that had been associated with dysphagia for 2 months. It demonstrated vertical movement on swallowing and protrusion of the tongue, and the thyroid gland was palpably normal with no cervical lymphadenopathy. She was in good health except for obesity; past surgical and medical history was unremarkable. A neck ultrasound showed a 2.8×2.1-cm, well-defined complex infrahyoid mass (mainly cystic with multiple septations (Figure 1) separate from the thyroid. There was no focal cervical lymphadenopathy. Computed tomography scan demonstrated similar features compatible with a diagnosis of a TGDC (Figure 2). Thyroid function tests were normal. A Sistrunk procedure was performed (frozen section was not available intraoperatively). Histopathology revealed a 4-cm diameter fluctuant mass, which, on sectioning, revealed a multiloculated cyst filled with gelatinous material. In addition, a papillary thyroid carcinoma was noted at one pole with tumor infiltration but incomplete penetration of the cyst wall (Figure 3). Two months later, the patient underwent a total thyroidectomy without nodal/compartmental dissection. The thyroid appeared clinically normal with no palpable nodes at operation. Pathological examination of the thyroid gland revealed a normal gland with no evidence of carcinoma.

DISCUSSION

TGDCs are uncommon and thought to arise as a result of the failure of the thyroglossal duct to involute. Ellis and van Nostrand suggested that this failure occurs in approximately 7% of the adult population. However, TGDCs are the most common congenital midline swellings that present to the general surgeon. These benign thyroglossal duct remnants may comprise up to 75% of midline neck masses in children and are found in up to 7% of adults. The finding of an incidental malignancy within this cyst is rare and within a thyroglossal duct remnant after simple excision even more infrequent. The true incidence of malignant transformation of TGDC is unknown but estimated at approximately 1%. A neoplasm arising from a TGDC was first described in the literature by Brentano in 1911; a search by Luna-Ortiz et al revealed only 215 cases in the world literature. The largest study to date
found only 14 cases of thyroid cancers in 1075 patients with thyroglossal cysts7 over the period 1971-1995. Papillary neoplasms were predominant.

In the past, there has been some speculation as to the origin of malignancy within a TGDC. However, it has been demonstrated histologically, that up to two-thirds of TGDCs contain thyroid tissue with its inherent propensity to malignant transformation just as possible.

In most cases documented in the literature as well as our own presented here, the diagnosis of malignancy was not suspected preoperatively either on clinical examination or intraoperatively.8-10 Preoperative imaging may not be able to diagnose a malignancy. Fine-needle aspiration cytology has a positive yield of approximately 66%.

Some surgeons consider a Sistrunk procedure as adequate, while others add a subtotal or total thyroidectomy. With no large studies and no long-term follow-up of the treatment modalities available, recommendations have been suggested with respect to indications for total thyroidectomy. These include finding a concomitant primary thyroid cancer, which occurs in 11% to 33% of cases, invasion into cyst wall, and tumors larger than 1 cm. Complete removal of all thyroid tissue also allows long-term monitoring with thyroglobulin levels and radioiodine ablation therapy if needed. There is great debate in the management of primary papillary thyroid carcinomas that are less than 1 cm in size, with some suggesting hemithyroidectomy alone is enough, avoiding total thyroidectomy with radioactive iodine and thyroid suppression.

The rarity of a diagnosis of carcinoma arising from a TGDC precludes consensus on the further course of management with the potential benefits of more aggressive treatment vs the lifelong consequences of total thyroidectomy and the inherent risks associated with surgery, radioactive iodine ablation/treatment, and lifelong hormone suppression therapy. In our patient, the final pathology of the thyroid was negative for malignancy, which adds fuel to the debate.

There are some who advocate that consideration be given to fine-needle aspiration cytology of all midline cystic masses in the neck. Whilst the risk of carcinoma may be small, the benefit of a planned, single operative procedure is obvious. The low diagnostic yield of fine-needle aspiration cytology is advantageous, especially with large cystic lesions with small mural tumor. We, however, believe the yield to be too low to warrant nonselective application and also that it should be reserved for evaluation of suspicious nodules in the thyroid. However, histological evaluation is absolutely necessary.

Guidelines based on level 1 evidence are currently unavailable due to the absence of large studies and long-term follow-up. If it is possible to stratify the risk for patients, higher-risk patients can be offered more aggressive treatment options.

It is well known that papillary cancer has a prolonged clinical course so that long-term follow-up is recommended (>20 years).

**CONCLUSION**

The Sistrunk operation may be adequate treatment for most patients with an incidental finding of a malignancy arising from a TGDC, but to date there exist no clear consensus guidelines on the further management. There

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**Figure 1. Cystic Mass**
may, however, be a role for identifying higher-risk groups who may benefit from more aggressive treatment as one would treat a well-differentiated thyroid carcinoma. In the absence of large prospective studies, the evidence obtained from case reports and small case series suggest that the safer option is extirpation of the gland.

**Figure 2. Thyroglossal Duct Cysts**

![Thyroglossal Duct Cysts](image)

**Figure 3. Histology of Thyroglossal Duct Carcinoma**

- **A** Demonstrates cuboidal epithelial lining of the duct cyst
- **B** Papillary architecture
- **C** Psammoma body
- **D** Showing nuclear grooving (×100)
REFERENCES


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The Journal of the National Medical Association welcomes your Letters to the Editor about articles that appear in the JNMA or issues relevant to minority healthcare. Address correspondence to EditorJNMA@nmanet.org.
The Optimal Management of Patients With Systemic Scleroderma and Coronary Artery Disease

Onyedika John Ilonze, MD, MPH; Nathan Ritter, MD

BACKGROUND

Systemic scleroderma and type 1 diabetes mellitus are autoimmune disorders that occur infrequently in the same patient. Scleroderma is relatively rare, with a prevalence of 1 in 4000 adults in the United States. Women are more frequently affected than men, and African Americans have a higher incidence than whites. The primary feature of scleroderma (also known as systemic sclerosis) is the dysfunctional fibroblast, which produces excess collagen and results in sclerosis of the skin, esophagus, and other organs. However, scleroderma patients also experience complications related to small vessel disease, due to chronic irreversible autoimmune-induced endothelial tissue injury. This is most evident in the digits, with the vascular damage resulting in skin ulceration and gangrene. Type 1 diabetes mellitus occurs due to autoimmune destruction of pancreatic islet cells and has a prevalence of 1 in 800 persons in the United States. Frequent, protracted hyperglycemia causes diffuse large- and small-vessel arterial disease, and the well-known complications.

It is well known that type 1 diabetics have a higher incidence of coronary artery disease (CAD) and worse outcomes than the general population. Conversely, CAD in the scleroderma patient is not well studied. There are few studies of the cardiac manifestations of scleroderma, which include myocardial fibrosis, pericardial effusion, arrhythmias, myocardial ischemia, and heart failure. CAD is not known to occur with greater frequency in scleroderma patients. Outcomes with the different treatments of CAD (medical therapy, angioplasty and coronary bypass) in scleroderma are unknown.

To our knowledge, there are no case reports or studies of CAD in a patient with both scleroderma and type 1 diabetes mellitus. We describe our experience with such a patient and discuss the applicable literature.

CASE

The patient is a 60-year-old female type 1 diabetic with diffuse cutaneous scleroderma affecting all of her skin, with erythematous papular rash on her right leg and neuropathic (Charcot) foot. She also has stable renal insufficiency without significant retinopathy. She presented with a lower gastrointestinal bleed and experienced a non-ST elevation myocardial infarction in this setting. Endoscopy showed severe duodenitis, multiple active ulcers, and moderate gastritis. She was stabilized on intravenous pantoprazole.

Cardiac catheterization showed severe triple vessel disease with relatively focal stenoses: left anterior descending, 90% mid-stenosis; left circumflex, diffuse mid and distal disease with subtotal distal occlusion; and right coronary artery, diffuse proximal to mid with 80% stenosis (Figures 1-3). Left ventriculogram revealed diffuse hypokinesis with apical akinesis and ejection fraction of 41%. Given her multiple comorbidities and concerns, including multiple active ulcers and gastritis, risk of bleeding on long-term antiplatelet therapy, and renal insufficiency, coronary artery bypass grafting (CABG) was recommended. The patient declined because she was concerned her surgical wounds would not heal due to the diffuse skin thickening both in her legs and chest and the presence of diabetes mellitus. She was managed medically.

About 8 months later, she presented again with dyspnea on exertion and ruled in for non-ST elevation myocardial infarction. CABG was again recommended and she declined. Several therapeutic options were considered to respect her wish to avoid standard bypass surgery. Bare metal stents, drug-eluting stents, and minimally invasive bypass were contemplated. Ultimately, bare metal stents were placed in the left anterior descending and circumflex arteries. Bare metal stents
were chosen empirically over drug-eluting stents due to persistent anemia and history of gastrointestinal bleed, although hemoccult studies were negative. We did not intervene on the right coronary artery due to the lesser severity of the lesion present.

She returned 3 months later with worsening dyspnea, and repeat angiogram showed severe in-stent restenosis of both circumflex and left anterior descending stents. There had been no issue of bleeding on combined aspirin and clopidogrel therapy during that time period. At this point, drug-eluting stents and minimally invasive bypass surgery were considered. The patient still had a strong preference to avoid standard bypass.

Everolimus eluting coronary stents were placed in the circumflex and left anterior descending arteries. She presented 6 months later with non-ST elevation myocardial infarction and large lateral wall motion abnormality. Coronary angiogram again showed aggressive in-stent restenosis of the previously placed stent in the proximal mid-portion 90% of the left anterior descending and completely occluded left circumflex artery without any antegrade flow. Given multiple percutaneous coronary interventions with suboptimal outcomes, she accepted CABG at this point. It was performed uneventfully with internal mammary graft to the left anterior descending and saphenous vein grafting to the right coronary and circumflex arteries. She had routine convalescence and excellent wound healing, without any dehiscence or infection. She is currently 18 months post surgery, and her symptom of dyspnea is much improved. The grafts have not yet been reassessed by stress testing or angiography.

Rheumatology consultation 2 years earlier had shown extensive thickening and tightening of the skin over the hands, forearms, abdomen, upper back, feet and legs, with morphologic appearance of scleroderma. Antinuclear antibody test was negative, but x-rays showed erosion of distal interphalangeal joints, which could not be explained by crystalline or degenerative joint disease, increasing the likelihood of systemic connective tissue disease. Skin biopsy failed to show any eosinophilic fasciitis, which was another differential diagnosis of the skin thickening. Though no conventional therapy for cutaneous scleroderma exists, skin symptoms improved significantly with minocycline and methotrexate.

**DISCUSSION**

We sought to provide evidence-based recommendations to our patient throughout the case. CABG was the initial recommendation, given the presence of triple vessel disease and type 1 diabetes mellitus. Multiple studies have shown that angioplasty in diabetic patients with multivessel disease is associated with significantly increased rates of restenosis, reinterventions, and lower survival when compared with CABG.3 However, in making this recommendation, we acknowledged to the patient that wound healing in diabetics is impaired and that we did not know if scleroderma would also affect the healing of her wounds after bypass surgery.4 Furthermore, we were uncertain how scleroderma would affect the durability of bypass grafts or stents—either bare metal or drug-eluting. We attempted to answer these questions by performing literature searches regarding wound healing in patients with scleroderma. We also researched outcomes of bypass grafting and stenting in scleroderma patients.

No studies in the literature have shown the rates of wound healing or post-CABG survival in patients with...
severe CAD and coexisting scleroderma. Surprisingly, we did not come across any data on outcomes or rates of wound healing in general in scleroderma patients. There are some reports of cosmetic breast surgery in women with localized scleroderma of the chest which mention that there were no wound healing issues. Because scleroderma causes excessive collagen production, we wonder if it actually enhances wound healing. There are no studies we know of which specifically address this idea.

Vascular injury occurs in many patients with scleroderma, affecting primarily arteries in the digits. The principal mechanism is overproduction of collagen and other extracellular matrix proteins, with damage and thickening of vessel walls and subsequent narrowing or obliteration of the vessel lumen. Also, recent evidence suggests that the presence of antiangiogenic factors in patients with scleroderma may be an important element in the abnormal vascular regeneration seen in this disease.

Given the potential for vasculopathy in these patients and the potential for affecting durability of grafts or stents, we were surprised when we did not find any studies or even case reports addressing outcomes of coronary revascularization with scleroderma. However, we did encounter a study of peripheral arterial bypass surgery in patients with scleroderma and chronic limb ischemia. In this study, 8 patients with scleroderma underwent peripheral vascular surgery: 5 patients had pedal artery bypass, 1 had distal peroneal artery bypass, and the remaining 2 patients had primary limb amputation. Although 1 patient with bypass surgery had early graft occlusion (with subsequent below-knee amputation), the other 5 patients with patent grafts initially had pain relief and satisfactory wound healing. However, 4 of these 5 patent grafts became occluded several months after surgery, with severe intimal thickening at the anastomosis, resulting in amputation in 2 of the cases. The study concluded that though arterial bypass surgery was successful in achieving early pain relief and healing of ischemic wounds, healing had limited long-term effectiveness with high rates of graft failure and limb loss. Based on the high rate of graft failure seen in this study, we are concerned about long-term patency of our patient’s coronary grafts, especially given the additional presence of type 1 diabetes mellitus. African Americans have a higher incidence of CAD, diabetes mellitus, and scleroderma, and worse outcomes compared to Caucasians. Given the higher incidence of comorbid systemic scleroderma in African Americans with CAD, there is an urgent need for optimal management choices and outcomes data.

Several clinical questions arise given the vasculopathic risk profile of scleroderma patients: What are the outcomes in the management of these patients? Is there a benefit of drug-eluting stents over bare metal stents? Is CABG the optimal treatment for this subgroup of patients? Registry data could be used to generate a case series study to address these questions. Further, with the poor results seen in the above-cited peripheral vascular bypass case review, it seems outcomes in this area should also be studied.

**CONCLUSION**

Our patient with type 1 diabetes mellitus, diffuse scleroderma, and triple vessel coronary disease had poor outcomes with restenosis of both bare metal and drug-eluting stents. CABG was ultimately performed successfully, with good wound healing of the leg and chest. Currently, there are no treatment guidelines, recommendations, or expert opinion on the management of coronary disease patients with this combination of problems or in patients with scleroderma alone. Graft failure and poor outcomes have been described in scleroderma patients undergoing peripheral vascular bypass surgery, causing concern regarding graft durability in scleroderma patients who undergo CABG.

We suggest that further review of case files be undertaken to determine the best approach to management of this subgroup of patients. We hypothesize that patients with concomitant systemic scleroderma and CAD have poorer cardiac surgical/interventional outcomes than similar CAD patients without systemic scleroderma or associated autoimmune disease. This can be tested by retrospective cohort or longitudinal studies and possibly by expert opinion and, in the future, guideline development. We do not have access to records of a substantial cohort of scleroderma patients at our small community hospital. There are no local or published registry data regarding outcomes of coronary revascularization in patients with scleroderma. Based on our review of the available published cases and case series, we feel that registry tracking of these patients is indicated. Furthermore, there is a need for cross-sectional assessment.

![Figure 3. Right Coronary Artery Showing Diffuse Proximal to Mid Disease with 80% Stenosis](image-url)
of coronary revascularization outcomes in scleroderma, and this study would best be done at a large institution with an allergy, immunology and rheumatology unit and a large cohort of patients with this disease.

REFERENCES
Just Saying No to NOTA: Court Permits the Sale of Hematopoietic Stem Cells

Robert Steinbuch, JD, MA

Keywords: law ■ organ donation

In a recent case decided by the US Court of Appeals for the Ninth Circuit, we see another struggle to work within the confines of poorly designed health-related laws.\(^1\) The case concerns the unintended side-effects resulting from laws that prohibit payments to “donors” of lifesaving biological material.\(^2,3\)

Recently, a medical school professor, parents of some sick children, an African American leukemia patient, and a nonprofit corporation—which sought to pay for bone marrow donations—all sued the federal government to have declared invalid a law that interfered with bone marrow and stem cell “donors” from receiving exceedingly modest compensation for their efforts.\(^1\) The program was initially designed to direct payments to minority and mixed-race donors of bone marrow cells, due to the greatest medical need in this cohort.\(^1\) The proposal to pay donors was simple: induce more donors through compensation. The question that the court faced was whether such payments ran afoul of the National Organ Transplant Act (NOTA), which criminalizes payment for organs.\(^1\) The statute defines human organ as a kidney, liver, heart, lung, pancreas, bone marrow, cornea, eye, bone, and skin, and any other organ specified by regulation.\(^1\)

Until fairly recently, stem cells for cancer treatment were taken from bone marrow.\(^1\) A newer technique obtains the same cells from blood.\(^1\) The blood is filtered to extract the stem cells, and the remainder transfuses back into the donor.\(^1\) Notwithstanding the greater ease of extraction, matching remains a problem.\(^1\) Unlike simple blood types, there are millions of marrow cell types, making matching difficult.\(^1\) “African Americans have especially great difficulty finding a compatible unrelated donor, as they tend to have a mix of African, Caucasian, and Native American genes, and fewer potential donors are registered in the national civilian registry.”\(^1\)

Plaintiffs—in their efforts to get the court to approve the $3000 stipend for stem cell donation—argued: (1) that NOTA violates the US Constitution, and (2) that NOTA does not govern stem cells taken from the blood instead of from bone marrow.\(^1\)

For the constitutional claim, plaintiffs had to demonstrate that no “rational basis” existed for distinguishing permissible from prohibited activities under NOTA.\(^1\) In other words, plaintiffs had to show it irrational to prohibit the sale of organs and bone barrow, on the one hand, while permitting the sale of blood, sperm, and eggs, on the other—as NOTA does.\(^1\) This legal standard starts with the presumption that laws such as NOTA are constitutional.\(^1\) (Since NOTA expressly prohibits compensating bone marrow donors, plaintiffs could not argue that it did not apply to bone marrow stem cells—as they did for the blood-borne stem cells.\(^1\))

As for whether NOTA’s distinction between compensable and noncompensable bodily substances has a rational basis, the court answered in the affirmative.\(^1\) And while such a justification could be hobbled together, perplexingly, an inchoate effort was never consummated by the court. Indeed, the court took pains to reject the commonly asserted, but wholly incorrect, basis that compensation is permitted for body parts that regenerate and prohibited for those that do not.\(^1\) NOTA makes no such claim, and the prohibition on the sale of part of a liver (which regenerates) and the permissibility on the sale of eggs (which do not regenerate) belies this post hoc rationalization.\(^1\) Equally, the claim that the law allows the sale of biological material whose transfer poses little risk or discomfort is contradicted by, among other examples, the sale of human eggs—which is moderately dangerous and onerous.\(^1\)

Nonetheless, the court held that a rational basis exists and ruled NOTA constitutional. Although the court failed to spell out the rational basis, that does not necessarily mean one does not exist. A rational basis, however, should not be confused with a good one. For
example, the Supreme Court upheld an Oklahoma law that prohibited opticians from, among other things, adjusting eyeglass frames—restricting such behavior to licensed ophthalmologists and optometrists—on the ground that it rationally could be supported by the government’s concern for the safety of its citizenry. While the Oklahoma law was constitutional, ie, it had a rational basis, it also was undoubtedly foolish—as is much of NOTA.

Regarding the second question—whether selling blood-borne stem cells is prohibited by NOTA itself—the Department of Justice (DOJ), the defendant, argued that allowing compensation for the donation of blood-borne stem cells is prohibited by NOTA. The DOJ generally argues in court for the clear dictates of a challenged federal law, regardless of whether the administration agrees with it. Thus, for example, even though the Obama administration disagreed with the “don’t ask, don’t tell” law that covered gays in the military, it defended that law. Where a law is not clear, however, an administration is free to choose any reasonable interpretation. And here, the law was, at best, not clear on the question of the applicability of NOTA to hematopoietic stem cells.

Nonetheless, the government argued for the less-plausible and more-damaging-to-public-health position: that blood-borne stem cells should be treated as bone marrow, not blood, because these cells originated in bone marrow. This view is curious because the more intuitive interpretation would be to equate blood-borne stem cells with blood, not bone marrow. Indeed, as the court recognized, a variety of components of blood originate in bone marrow, and NOTA permits the sale of blood and these other components.

The government’s reasoning seems to have been that paying for stem cells would result in poorer minorities, among others, improperly feeling “pressure” to commodify themselves. I have previously advocated against such paternalism, particularly when no similar ban exists on mining coal or other employment opportunities far more dangerous than “donating” biological material that saves lives. Indeed, the government argued that the court should prohibit acts that would be wholly permissible if done for free. Thus, asking a poor person to donate marrow for free is perfectly OK, but helping that extremely kind donor with modest compensation is somehow bad.

That logic seems confused. Moreover, this overprotectiveness harms the very cohort that the avowed policy is asserted to benefit, as many minorities particularly need scarce biological material from other members of their relatively small, genetically similar group.

Further, in evaluating this philosophical conundrum, consider why an act considered laudable becomes, according to some, dangerous or improper when accompanied by payment. True, the motivation of the “donor” will change with compensation, but does the act’s underlying virtue and inherent benefit become so corrupted that we should prohibit it? If you answered yes, consider whether you might change your mind if you daughter needed the transplant. And while it is absolutely correct that difficult decisions are better made without the duress of a loved one’s illness, the sterile analysis of life-and-death situations made in the abstract may result in principles that work well in a law school debate, but not in a hospital or for a family.

Notwithstanding these philosophical questions, the court simply rejected the argument that NOTA banned the sale of blood-borne stem cells based on the language of the statute and after the government admitted that paying ordinary blood donors is permissible under NOTA.

While the court interpreted the law well enough, the underlying question remains: Why should we continue to be subjected to a law that all but arbitrarily prohibits payment for some biological materials, but not others? The inherent contradiction in NOTA highlights that the time has arrived to take a new look at this old law. And though the broader issue of payment for organs requires further discussion, the current regime, which haphazardly permits small efforts to induce greater donation of biological material in some instances, but not others, simply does not make for good health law or policy.

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The Forgotten MASH Surgeon: The Story of Alvin Vincent Blount Jr, MD

Kenneth L. Wilson, MD, FACS; Wayne L. DeBeatham, MD; Omar K. Danner, MD; L. Ray Matthew, MD, FACS; Louise N. Bacon, MD; William Lynn Weaver, MD, FACS

In 1968, H. Richard Hornberger, former army surgeon, writing under the pseudonym Richard Hooker, published the novel *MASH: A Novel About Three Army Doctors*, based on his experiences as a military surgeon and a captain in the 8055th Mobile Army Surgery Hospital (MASH) during the Korean War. His popular account of the fictional 4077th MASH gave rise to an Academy Award–winning film in 1970 (Best Adapted Screenplay plus 4 additional nominations) and subsequently to the popular and long-running television series M*A*S*H. The character Oliver Wendell “Spearshucker” Jones, a neurosurgeon, who was first introduced in the novel, was subsequently written out of the series (“Germ Warfare,” the 11th episode of season 1) by the sitcom’s creator in an attempt to maintain historical accuracy based upon the long-held view that no black surgeons served during the Korean War. The accomplishments of African American military medical personnel generally went unheralded in the initial period following desegregation of the US Armed Forces. The lack of participation of black surgeons in the Korean War is a misrepresentation that has been deleted from history and inaccurately chronicled in popular culture.

President Harry S. Truman signed Executive Order 9981 in 1948, permanently ending racial segregation in the US Armed Forces. It was the most significant development in America’s battle over race in the military since the Reconstruction’s Civil Rights amendments. In spite of General MacArthur’s recalcitrance in integrating the fighting forces during the Korean War, his replacement, General Matthew Ridgway, in April 1951, for morale purposes wished to desegregate the forces under his Far East command. Ridgway, who declared segregation as a whole to be “un-American and un-Christian,” acted swiftly and decisively to finally end the segregation debate. Training was the first element to be integrated. A young Negro captain by the name of Alvin Vincent Blount Jr (Figure), now age 89 years, recalls that “he was the first black boy to serve in an integrated MASH unit (April 15, 2011, phone interview).”

The MASH was a new organization announced on August 23, 1945, at the very end of World War II. The MASH unit was designed to be fully mobile in that the full hospital could be broken down and loaded into trucks along with hospital staff. The setup of the hospital was to be quick and to allow for the receipt of wounded soldiers within hours of re-expansion, and was usually located within 20 minutes of the front lines. Early in the war, there was a severe shortage of personnel to staff the MASH units even after the military stripped other medical department units and reassigned them to MASH units. The residency programs in the army hospital system were then tapped to provide partially trained specialists on temporary duty. The doctor shortage was eased by the draft of 1950. These physicians had only recently completed their medical training and had begun busy civilian practices. In 1951, the 8225th MASH unit was deployed, and an additional unit was organized by the Norwegians and sent to Uijeongbu, Korea, the same year. Captain Blount, after serving 3 years prior in the army, was now one of the new medical graduates called to active duty after completing his surgical internship in 1954. Blount’s arrival to Fort Bragg, North Carolina, to meet his commanding officer, Lt. Col Robert Newell, would not only prepare him for his activation to Korea, but to eventually serve as the first Negro chief of surgery in a MASH unit.

Dr Blount was born on February 24, 1922, in Raleigh, North Carolina. He entered North Carolina A&T University in Greensboro in 1939 (1939-1943) and distinguished himself by graduating with honors and by serving as student body president and chairman of the campus newspaper. He obtained his medical degree from Howard University, Washington, DC (1944-1947), where he studied under the famous Dr Charles Drew. Dr Blount spent 5 years on active duty; 3 years were prior to his completion of medical school. His second call to military duty was as a member of the US Army Medical
Corps, and resulted in his mobilization overseas to Korea. The mobilization to Korea occurred as he had just completed his internship and surgical residency at Kate B. Reynolds Hospital in Winston-Salem, North Carolina. He was mobilized with the 8225th from Fort Bragg, the second MASH\(^1\) to be sent to Korea in 1952.

Dr Blount recalls that the location of his MASH unit was 10 miles from the 38th parallel, the strip of land dividing North Korea and South Korea that was crossed by the North Korean People’s Army attacking the Republic of South Korea, prompting US intervention in the Korean War.\(^6\) The MASH was intended to bring emergency lifesaving surgery closer to critically wounded caualties in a forward location just out of reach of the enemy artillery range, in support of each division, similar to the combat support hospitals in current conflicts in Afghanistan and Iraq. The 8225th MASH unit was mobilized to support the 1st Cavalry Division (Fort Hood, Texas), the 2nd Infantry Division, partially made of KATUSAs (Korean Augmentation to US Army), the 24th Infantry Division (Fort Riley, Kansas), and the 25th Infantry Division (Wahiawa, Hawaii). Proximity to the battlefield meant that mortar rounds were felt nearly every night and the number of wounded seen during Dr Blount’s 2-year tour meant up to 3 sleepless nights at a time to care for civilian and military casualties. The MASH unit operated with 4 surgical tables but was optimally staffed to run 2 tables at the same time. However, during the arrivals of mass casualties, all 4 tables were utilized simultaneously, with surgeons and the 2 anesthetists rotating to complete resuscitations and operations. During his tour in Korea, Dr Blount’s team performed 90 major and minor surgeries a week. Field surgery techniques were often utilized, such as multiple debridement’s for soft-tissue wounds, and temporary abdominal closures for penetrating abdominal wounds. Head and neck injuries were scarce, and penetrating carotid injuries were even more remote. However, thoracic injuries were not uncommon, and Dr Blount recalls successfully managing a thoracic injury penetrating the pericardium. His most vivid and macabre memory was of treating allied soldiers with penile mutilations inflicted by the People’s Republic Army that required urologic procedures in this austere environment. The total number of admissions for the 8225th during its deployment was 1936, with only 11 deaths reported, giving the staff a survival rate\(^11\) of 99.4%. At one point during Dr Blount’s tour, the chief of surgery became ill and was incapacitated for 6 weeks. In his absence, Lt Col Robert Newell named Dr Blount Jr chief of surgery of the 8225th. Dr Blount received the Incident Participation medal (later known as the Korean War Service medal) for his meritorious service as a field surgeon in Korea.

Dr Blount returned to the Jim Crow South in 1954, making his home in Greensboro, North Carolina. Deciding to settle in the Jim Crow South was a painful choice that an increasing number of black doctors refused to make as the 20th century progressed.\(^12\) Dr Charles Drew told Dr Blount and others: “You boys going south will have to sweat it out, but victory will come.”\(^13\) Negro surgeons were excluded from local and state medical societies, given limited or no privileges in public hospitals and were virtually prohibited from treating white patients. The extremely polite and amicable Dr Blount, whose skill and knowledge lead to his becoming the chief of surgery for an integrated US Army hospital in southeast Asia, would have to fight his way into the operating room at Moses Cone Hospital in Greensboro. Since opening in 1953, Cone had treated black patients, but only those who had white physicians. Black medical professionals had to work mainly at L. Richardson Memorial Hospital, which was primitive compared to the segregated Cone Hospital and Wesley Long Hospital. Cone Hospital required doctors to belong to the Guilford County Medical Society, which did not give black doctors full membership, thus allowing the hospital the legal right to ignore the war veteran’s medical credentials.\(^13,14\)

In 1962, Dr George Simkins, a fiery black dentist whose temperament was the opposite of Dr Blount’s, enlisted himself, Dr Blount; Walter J. Hughes, MD; Earl Davis, MD; E.C. Noel, MD; G. Alexander, MD; N.N. Jones, MD; W.L.T. Miller, DDS; and Milton Barnes, DDS, to join him in suing Cone and Wesley Long. Simkins v Moses H. Cone Memorial Hospital (1963) challenged the federal government’s use of public funds to expand and maintain segregated hospital care.\(^13,15\) The federal government agreed that the use of federal funds in a discriminatory manner was unconstitutional and that these professionals and patients should be granted the privileges and services they sought.\(^13\) Subsequent to the integration of Cone Hospital in 1964, Dr Blount became the first African American to operate at Cone.\(^13\)
The significance of *Simkins v Moses H. Cone Memorial Hospital* is demonstrated by the US Court of Appeals Fourth Circuit references to this decision in nearly every hospital discrimination case (>260) that followed for the next 2 decades. Dr Blount, who is the only remaining litigant alive, still maintains his privileges, as the plaintiffs had quietly agreed that none of their privileges would lapse as long as they were still practicing dentistry or medicine.

Dr Blount’s distinguished surgical career includes service as chief of surgery for L. Richardson Hospital for 23 years. He was responsible for establishing the hospital’s first quality improvement committee when he recognized that too many hysterectomies were being performed without proper indications. When questioned about helping integrate Greensboro’s hospital system, Blount said, “When I see black doctors and nurses at the 2 hospitals, I say to myself, ‘this is how it should be.’ We are offering full health care to everyone.” Historian Toni Colley-Lee, the daughter of an attorney who shared the same office building with Dr Blount, recalls, “You could pull up into the parking lot and see people sitting on trucks and cars and in line to see him. If you asked a couple why they were there, they’d say ‘to see the MASH doctor they say is so good.’” (T. Colley-Lee, personal communication, April 26, 2011).

Dr Blount is not only a decorated military surgeon; he is also recognized as an outstanding physician in the Greensboro medical community. He is the recipient of the Legacy Award from the Old North State Medical Society (North Carolina’s chapter of the National Medical Association) and has been given the highest honor that can be granted to a civilian by the governor of North Carolina, The Order of the Long-Leaf Pine. Although he retired from a full surgical practice in 1994, he continues to see patients and maintains an office in the Greensboro community providing medical services, such as primary care, physical exams, minor surgeries, and monitoring of chronic health conditions. Dr Blount served as the former medical director for the Guilford Health Care Center and is an executive committee member of Kindred Hospital (formerly L. Richardson Hospital). In recognition of Dr Blount and a fellow civil rights pioneer, George Harrison Evans, MD, a medical office facility on Martin Luther King Dr in Greensboro, the Evans-Blount Community Health Center, bears their names.

The authors, who are aware of the contributions of African Americans in armed US conflicts, found it difficult to believe that the deletion of “Spearchucker” Jones from the popular series MASH parallels a lack of participation of African American combat surgeons in the Korean War to be true. The evidence demonstrates that Dr Blount not only served proudly during the Korean War but that he was indeed the first black chief of surgery of an integrated MASH unit. As all accounts of valor of black soldiers have not been told, we recognize that our search for African American surgeons serving in the Korean War by no means eliminates the possibility that other names will emerge. It is indeed the authors’ sincere hope that this spawns a new interest in correcting a chapter in our history of failing to recognize the contributions of any African Americans mobilized in defense of this great nation. We hope that stories of other African American Korean War surgeons emerge before the last members of the “greatest generation” move into the sunset.

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The purpose of this historical article is to demonstrate, as the biography of Verina Morton Jones, MD, is uncovered, the difficulties inherent in researching original source material on the lives of 19th- and early 20th-century African American physicians as well as the great benefits derived from doing this research. The procedures used include basic archival research and close examination of published materials about her in the past, in conjunction with oral history. Original correspondence from Dr Morton Jones to her niece and nephew is used to illustrate events in her life and the thoughts and attitudes she expressed. Some of these thoughts and attitudes reflect those current situations in which African Americans found themselves, and others are quite unique, no doubt owing to her privileged position in the African American community. The principle conclusions reached include the great benefits derived from doing this kind of research, as difficult and time-consuming as that may be, with the enhanced knowledge and appreciation of the heritage of African American physicians, and insights into American social history during this period.

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As a history librarian and archivist for the American College of Obstetricians and Gynecologists in Washington, DC, from 1991 to 2001, I had the good fortune to receive assistance in pursuing a master’s degree in history at the University of Maryland. My special interests were the history of medicine and women’s history, so an analysis of the history of women physicians, specifically from their own point of view, appealed to me.

I first encountered Verina Morton Jones (Figure 1) in a book on the history of race relations in the United States. The author stated in his discussion of the history of the National Association for the Advancement of Colored People (NAACP) that Dr Morton Jones, “one of the first African American physicians in the country,” had been on the first executive board of that organization. She was only mentioned in a paragraph or 2 in the book but she made an impression on me. I sought her out in Darlene Clark Hine’s *Black Women in America* and was surprised at what I found, given her relative anonymity.

She was born in Cleveland, Ohio, in the early 1850s and went to school in Columbia, South Carolina, where she taught school for a few years. She attended medical school in Philadelphia at the Women’s Medical College of Pennsylvania (WMCP), graduating in 1888. Her first position was in Holly Springs, Mississippi, as the resident physician of Rust College, making her not only the first African American female physician to practice in the state, but the first female physician of any race. She married another physician and settled in Brooklyn, New York, where she practiced medicine. During her career in Brooklyn, Dr Morton Jones also engaged in many community activities. For example, she contributed the down payment on the property for and became head of the Lincoln Settlement House, established in 1908. She set up a day nursery and lecture series on health and hygiene there. During the first 2 decades of the 20th century, she became president of the Equal Suffrage League in Brooklyn, director of mothers’ clubs in Brooklyn through the National Association of Colored Women, and a leader of the Association for the Protection of Colored Women, all organizations having a close connection with the founding of the NAACP and the Urban League. She volunteered teaching classes in health for the Phillis Wheatley chapter of the YWCA. She was a major activist in both interracial social justice organizations and in strictly African American associations working toward what was then termed “racial uplift.”

After reading all this about Dr Morton Jones’ activities and accomplishments, I wondered how could this remarkable woman be so little known? Thus began my mission to uncover her story. In the process, I began to realize how the stories of seemingly obscure people such as Verina Morton Jones can illuminate American history.

Verina Morton Jones has been neglected by scholars more for lack of easily accessible material than for lack of interest. The article in Hine’s book listed several references, but in most of these citations she was mentioned so briefly as to be not much more than a footnote. The article did indicate that her papers were at the Moorland-Spingarn Research Collection on African American History at Howard University, but a request via telephone yielded no help. The staff person said, to my great disap-
pointment, that no records on her could be found. I continued my search by trying to locate the author of the article in Hine’s book. Once I found her, I learned that she had been a graduate student at the time, working under the direction of Professor Dorothy Salem, author of To Better our World: Black Women in Organized Reform, 1890-1910. Professor Salem, whom I contacted next, was encouraging and enthusiastic about my project, providing new leads and admitting that Verina Morton Jones had been one of her favorite biographical subjects. What was needed, she felt, was some information about what Dr Morton Jones thought and felt about matters of the day.

At the WMCP archives, I was able to locate Dr Morton Jones’ thesis, a 20-page document with “Cholera Infantum by Verina M. Harris, Columbia, SC” written on the cover page (Figure 2), and a photo of her with 27 of her fellow students (Figure 3). Morton Jones attended WMCP for 4 years, though the school did not require this until 1893. WMCP was an early adopter among American medical schools of the 4-year graded curriculum. I was able to glean little else about Dr Morton Jones from the WMCP records beyond the name of her hometown when she entered medical school (Columbia, South Carolina), a listing of the courses she took, her grades, and the financial aid she received.

Next came a visit to the Library of Congress, where I worked through the papers of the NAACP. The minutes of the organization’s executive board meetings did indeed identify Dr Morton Jones as a member who attended nearly every monthly meeting from 1913 to 1923. Based on these minutes, she at first seemed a fairly quiet but constant presence, always addressed as “Dr Jones.” But Dr Morton Jones appeared prominently in the June 1915 minutes, reporting from a committee of women working with church groups in “parlor meetings” in their homes to gather support for the NAACP. Her report stated that the Baha’is (a religious faith group that was introduced in North America in the early part of the 20th century), through “Mr Harris” (no relation), had been the first to invite the NAACP representatives to speak to them. Other executive board members Morton Jones served with included people who are much better known today than she is, including W.E.B. Du Bois and Mary White Ovington. For many years, she was the lone African American woman serving on that body committed to interracial healing and social justice, a testament to the high regard in which she was held in both the white and African American communities.

The Works Projects Administration (WPA) papers at the Schomburg Collection on African American History at the New York Public Library were a disappointment. I found many papers relating to African American life in Brooklyn during the first 3 decades of the century, including records on Ashland and other settlement houses in the area; the White Rose Mission and Industrial Association; the Phillis Wheatley chapter of the YWCA; the Equal Suffrage Society; the Urban League chapters and predecessors such as the Committee for Improving the Industrial Conditions of Negroes, the Committee on Urban Conditions Among Negroes, and the National League for the Protection of Colored Women. I knew from other sources that Dr Morton Jones had been

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**Figure 1.** Verina Morton Jones, MD

**Figure 2.** Thesis of Verina Morton Jones, MD
associated with all these organizations—had even held leadership positions in some of them—but I found nothing specifically mentioning her name in these records.

The Lincoln Settlement House was the first social service organization in Brooklyn to attempt to deal with the needs of the African American population on a comprehensive scale. In a letter to her niece Carlotta Stewart, which I located much later in my search, Dr Morton Jones tells of having to turn the Lincoln Settlement House over to the Urban League in 1926 because of her worsening financial situation and her inability to raise the funds to keep it going. Why is the record silent on this? Other individuals are mentioned in the WPA papers account, but not Verina Morton Jones.

Regarding Dr Morton Jones' medical practice, I was able to discover little. It is almost certain that she practiced out of her home at 105 Fleet St, also the address of the Lincoln Settlement House. Over her 4 decades of living in Brooklyn, she had 2 other addresses, including one on Gold Street in the Fort Greene neighborhood that had a reputation as a community of upper-middle-class African American professionals. She was not associated with any hospital but was listed as a member of the Kings County Medical Society9 in 1908–1909. In that same directory of the medical society, Dr Morton Jones identified Caroline V. Anderson as her mentor, another notable African American female physician graduate of WMCP.

I attempted to continue my search for information at the Brooklyn Historical Society only to learn that it had recently closed for renovation until further notice. So I turned to the local history librarian at the Brooklyn Public Library, who gave me a piece of information that changed my research entirely. She sent me an obituary of Dr Morton Jones' son, Franklin W. Morton,10 whom I had already learned was born in 1892, shortly before the doctor's husband, Dr Walter A. Morton, died. The son's obituary stated that Franklin W. Morton had a son, Franklin W. Morton II, born in 1920, and a grandson, Franklin W. Morton III. Unable to locate much information about him on the Internet, I tried locating him through New York City directory assistance and found a Frank Morton living in Manhattan. This man turned out to be Franklin W. Morton III, the only great-grandson of Verina Morton Jones. When I explained my business, he deferred to his father in Florida, with whom, coincidentally, he had just been speaking.

Franklin W. Morton II, the only living grandchild of Verina Morton Jones, was a retired justice of the Supreme Court of New York. Two things Judge Morton told me in our early conversations opened up major avenues of research. One was that his grandmother had a prominent relative, better known than she, named Thomas McCants Stewart (1853–1923). Stewart had been a lawyer, political activist, and judge in South Carolina; New York; Hawaii; London, England; Liberia; and St Thomas, Virgin Islands, and had been married to Dr Morton Jones' sister Charlotte. The couple had 3 children—McCants, Gilchrist, and Carlotta—beloved nephews and niece of Dr Morton Jones. McCants Stewart's daughter, Katherine Stewart Flippin, collected

Figure 3. Verina Morton Jones, MD With 27 of Her Fellow Students
papers of her relatives, including a quite large collection of correspondence from Dr Morton Jones to her nephew McCants, and presented them to Howard University's Moorland-Spingarn Archives on African American history. These papers were known as the Stewart-Flippin papers. Armed with this new knowledge, and on the advice of Judge Morton, I returned to the Moorland-Spingarn Research Center requesting the Stewart-Flippin papers and found Morton Jones immediately—more on this shortly.

Judge Morton's other helpful reference was to an article entitled "John Carruthers Stanly and the Anomaly of Black Slaveholding" by Loren Schweninger, a history professor at the University of North Carolina–Greensboro. The judge explained to me how his grandmother had had the opportunity to obtain a medical school education in the 1880s and why, though born in Cleveland, Ohio, she had received her education in South Carolina. He believed it was because her grandparents and parents had inherited money from the sale of real estate and slaves, most of whom they freed in Ohio before Emancipation. Her parents later returned to South Carolina to help teach freedmen. Dr Morton Jones' fascinating family heritage was, it turns out, documented in Schweninger's article on John Carruthers Stanly.

John Carruthers Stanly (ca. 1774-1846) was the child of John Wright Stanly (1730-1789), a wealthy white shipping magnate and Revolutionary War hero, and an Ibo slave woman about whom no information is available. Stanly apparently took possession of the child and gave him to his Quaker friend and neighbor, Alexander Stewart, and his wife Lydia of New Bern, North Carolina. The Stewarts taught the boy, befriended him, and set him up as a barber. Young Stanly quickly built up a lucrative trade and hired slave apprentices to help him. In 1795, the Stewarts petitioned the Craven County, North Carolina, court for his freedom. Stanly, having through the barbershop acquired a "considerable real and personal estate," and fearing he might somehow be deprived of his earnings, further petitioned the court to pass a law to "confirm, establish, and protect his rights and privileges attendant thereon." Such a law was passed, and Stanly, whose frequent purchases and sales of property assured him a regular presence in the Craven County court records, very quickly made a fortune.

Stanly maintained his barber business in New Bern and had several children with a slave woman named Kitty, daughter of Richard and Mary Green from New Bern, who had lived as slaves for most of their lives. The Greens had been able to extricate themselves from slavery by working for themselves but were enslaved when Stanly met Kitty. By 1805, Stanly had purchased the freedom of all of them—his wife, children, and in-laws. On March 26 of that year, he was able to hold a marriage ceremony with proper witnesses. A white bondsman in Raleigh posted their legal marriage bond. At the height of his career, John Carruthers Stanly's net worth was more than $68,000, making him not only the most prosperous free person of color in North Carolina by a substantial margin but among the half dozen wealthiest free African Americans in the entire south. Schweninger calculated that his wealth, were it compared with that of white property owners at mid-19th century, would have placed in the top 0.5% of white men in the nation. He had as many as 125 freed people and slaves working for him.

John Carruthers Stanly was Verina Morton Jones' great-grandfather. I learned from reading her correspondence preserved in the Stewart-Flippin papers at the Howard University Library that she was very proud of this family heritage. She held onto various precious family heirlooms, which she gave to her son, grandson, and niece and nephews over the years. My persistence had paid off. Having uncovered the John Carruthers Stanly story and then having read dozens of Dr Morton Jones' letters from 1905 to 1927—mostly to her beloved nephew, McCants Stewart, but also to other family members—I felt that I had hit a gold mine.

Dr Morton Jones' letters to McCants Stewart from 1906 to 1910 are exactly what Dorothy Salem spoke of in wanting to get at the thoughts and feelings of Verina Morton Jones. Stewart (1877-1919) was, like his father, a very successful and prominent lawyer, the first African American to attend graduate school at the University of Minnesota. He was Dr Morton Jones' favorite nephew. She poured her heart out in letters to him, sharing her pride in and worries about her son, her delight in her nephew's successes, her joy at his marriage and the birth of a child, her worries about money, her interest in her family heritage, her resentment about various family feuds, her deep Christian faith, and her occasional depression—it's all there. Some particularly fascinating epistles related her version of the family history, in which she explained that the family wealth was inherited and that nothing was left of it. She wrote her nephew that her grandmother told her stories of the family history and that her great-grandfather was given slaves to manumit by white slaveholders, a fact historian Schweninger corroborated from court records. Dr Morton Jones did not mention that Stanly had bought and sold slaves himself, a fact Schweninger also documented. In another letter she tells Stewart poignantly, "The thing you wanted to know, I didn't tell you. There are thousands of people passing for white in New York, hundreds we know. It's very normal..."

Generally, the letters to her nephew were loving and encouraging, although money worries were also a constant theme. In an uncharacteristically morbid note dated May 8, 1910, when she was feeling particularly despondent over her financial situation, she wrote about the "boys" waking up to see the "comet" (Haley's comet), but "I cannot get up so early. If it [the comet] smother us all, so much the better, we won't be living all this dissatisfaction. I would just like to see one satisfied person, from John Q to the common beggar; all are the same." Verina Morton Jones suffered more than her share of personal loss. She lost her husband, Walter Morton, MD,
after just a few years of marriage, and a daughter within 2 weeks of that. She brought her mother, a teacher in freedmen’s schools after the Civil War, from South Carolina to live with her in Brooklyn, where she died in 1905. Dr Morton Jones’ sister Charlotte (Lottie) died in 1906 in Florida, apparently estranged from the family. The loss of her nephews “Mac” (McCants) in 1919 by suicide and “Chris” (Gilchrist) in 1926 must have been additional heavy blows. As early as the 19-teens, she often repeated in her letters her fear that her second husband, Emory, whom she married in 1901 and was apparently never in good health, would go before her. In fact, he left her a widow for the second time in 1927.

Despite all of these events, this period from 1905 to 1927 was the time of her greatest flourishing in the public record. Her name appeared in a multitude of references to leadership roles at, among others, the Lincoln Settlement House, the Equal Suffrage Society, the Phillis Wheatly Branch of the YWCA, and the NAACP executive board. According to an interview in January 2002 with Franklin W. Morton II, grandson of Dr Morton Jones, shortly after the death of her nephew McCants in 1920 and around the time of the birth of her grandson, she campaigned for her son, who was running for office in Brooklyn.

It appears to me that based on her letters to McCants Stewart, Dr Morton Jones’ professional life was almost another world from her private life. Of her life she wrote, “You have no idea, Mac, what foolish things I do to keep my nose to the grindstone. I don’t keep out of debt. I’ll have, he said. She gave to her nephews for their education and to her son, who drank a lot. To her grandson, she was a doting grandmother who “bribed” him to come visit her. She gave property and money to all her little projects. This was, Judge Morton told me, her tragic flaw, in effect.

Instead of falling into despair in 1927, having lost the last 2 people closest to her and retired from practice, she again showed tremendous pluck and enduring energy by moving to Hempstead, Long Island, New York, and working with a group of women to establish the Harriet Tubman Center, a social service organization for transient young African American women.17

Female physicians of any race had to fight an uphill battle to be accepted by the male medical establishment in the early years of the 20th century. An African American woman practicing medicine and being a social activist at a time when lynching was common had to face many tests and difficulties, yet Dr Verina Morton Jones was not only successful as a female physician but as a leader and community activist in a myriad of social welfare programs. She truly lived her ideals in spite of personal losses. Verina Morton Jones not only fought for the rights of African Americans but was a major proponent of interracial friendship and collaboration. She maintained a close personal friendship and collaboration with Mary White Ovington, NAACP cofounder, in an era when most prominent female suffragists had turned their backs on women of color.

Verina Morton Jones was one of a number of late 19th- and early 20th-century African American female physicians with stories of what they overcame to “make it” in a male- and white-dominated profession. I was fortunate in my search for information about Dr Morton Jones. Papers of other unheralded black female physicians may lay undiscovered in archives or family attics or basements. These papers must be located and preserved, and the stories they contain must be told or we will continue to miss out on a vital part of our history.

REFERENCES
ACADEMIC ANATOMIC/SURGICAL PATHOLOGISTS
THE DEPARTMENT OF MEDICAL PATHOLOGY
AND LABORATORY MEDICINE

The University of California, Davis, School of Medicine is seeking dynamic academic physician-investigators and educators to grow clinical, teaching and creative programs that interface traditional anatomic pathology with new diagnostic technologies, such as molecular/genomic pathology and/or telepathology/digital pathology. Ideally, the successful candidate will expertise in molecular-anatomic, or telepathology/digital pathology in addition to subspecialty interests in urologic, head and neck, or other organ system areas of pathology, are highly desirable. Clinical duties will chiefly involve surgical pathology and autopsy pathology, including outreach activities for critical access hospitals in rural areas. Teaching duties may include clinical, didactic, and small group teaching of housestaff and medical students, and interdisciplinary conferences to housestaff and faculty. Participation in the research mission of the institution is expected, either as a collaborator or as the intellectual leader of clinically-oriented research projects, depending on the appointment series. The successful candidate must have the ability to maintain a high level of service, work cooperatively and collegially within a diverse environment, and should exhibit excellent interpersonal skills to build and maintain relationships with medical and technical staff, trainees, and others. Candidates must be board-eligible or certified in anatomic pathology, and have an appropriate record of accomplishment in clinical care, teaching and research to meet requirements for appointment at the Assistant, Associate or full Professor level in one of the University of California’s clinically-intensive academic series (Clinical, Health Sciences Clinical Professor). California medical license preferred. Eligibility for licensure to practice medicine in California is required.

The Department of Pathology and Laboratory Medicine has over 40 faculty members, provides service in all major subspecialties of anatomic and clinical pathology, and is active in basic science, translational, and clinical research. The Department is actively expanding its outreach and telepathology programs. Educational programs include a 14-person residency program and specialty fellowships in hematopathology, cytopathology, surgical pathology and transfusion medicine. The University of California, Davis, Medical Center, one of the nation’s “Top 100 Hospitals,” is a 576-bed academic medical center, with the distinction of having an NCI-designated Cancer Center. A new addition was recently completed which added hospital beds, operating rooms, frozen section suite and clinical laboratories, and emergency treatment stations. UC Davis Health System offers exceptional employment benefits including medical, dental and vision plans, generous paid vacations and holidays, excellent retirement savings and investment plans, continuing education, and reduced fee and scholarship programs.

For full consideration, applications must be received by February 15, 2012; however, position will be open until filled, but no later than June 1, 2012. Please forward the following: 1. Curriculum vitae 2. Statement of clinical, teaching and research background 3. List of names and contact information for at least five references to: John Bishop, MD, Chair Search Committee, via e-mail to Anandika Shafiq, Division Assistant at Anandika.Shafiq@ucdmc.ucdavis.edu, or via regular mail to John Bishop, MD c/o Anandika Shafiq, Department of Medical Pathology and Laboratory Medicine, University of California, Davis, Medical Center, 4400 V Street, Sacramento, CA 95817.

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MICHIGAN STATE UNIVERSITY
REPRODUCTIVE AND DEVELOPMENTAL SCIENCES PROGRAM

The Reproductive and Developmental Sciences Program (RDSP) at Michigan State University is undergoing a major expansion in conjunction with the Center for Women’s Health Research and the Engineering and Health Initiative. This expansion is a joint effort between the Colleges of Human Medicine, Agriculture and Natural Resources, Veterinary Medicine, and MSU AgBioResearch. Applications are invited from outstanding scholars for up to eight tenure track positions at the ranks of Assistant, Associate and Full Professor. Individuals with a Ph.D., MD, DVM, DO or a combination of advanced degrees with excellent post-doctoral training and/or an established track record of scholarship and funding are invited to submit their applications. The individuals should be committed to interdisciplinary and collaborative research focused on Reproduction and Development and will be part of an established and vibrant joint program involving faculty in East Lansing and Grand Rapids. It is expected that the junior faculty candidates will complement the interests of the senior faculty hires to enhance existing programs or develop focused and thematic areas of expertise that will lead to further scientific advancement and the development of multi-investigator projects for extramural funding. The positions will be within the Department of Obstetrics, Gynecology and Reproductive Biology in the College of Human Medicine, the Department of Animal Science in the College of Agriculture and Natural Resources and the Department of Physiology in the College of Veterinary Medicine. The primary areas of emphasis are Stem Cells and Regenerative Medicine, Developmental Epigenetics, Environmental Impact on Reproduction and Development and Women’s Health and Reproduction. Excellent start up and benefit packages commensurate with academic rank are associated with these positions. Interested applicants should submit detailed curriculum vitae, a summary of research plans and future goals and names and contact information for three referees to: Asgi Fazleabas and George Smith, C/O Jane Worthington, RDSP Faculty Cluster Hire, 1230 Anthony Hall, East Lansing, MI 48824-1225 • 517 353 8778 (phone) • rdsp@msu.edu • http://rdsp.canr.msu.edu

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We are seeking a full-time physician with experience in adult primary care, women’s health, or family practice. S/he will join a team of fifteen other primary care physicians and five nurse practitioners, with emphasis placed on working with patients from diverse cultural backgrounds. There are shared on call responsibilities (1 in 10) with no inpatient responsibilities. There are opportunities for teaching at MIT Medical, on the MIT campus, and at area hospitals. Harvard Medical School faculty appointment.

At least five years of post-residency clinical experience is preferred. Ideal candidates have demonstrated excellent clinical skills along with proven ability to work as part of a multidisciplinary team and to work with patients from diverse cultural backgrounds. An interest in women’s health issues is preferred. Candidates must be board certified in internal or family medicine; board eligibility must be maintained. EMR experience required. Preferred. Candidates must be board certified in internal or family medicine; board eligibility must be maintained. EMR experience required.

We will have demonstrated leadership experience in academic medical schools of New York University. Candidates should have a distinguished record of scientific achievements, the ability to foster collaborations and promote innovation and creativity. The successful candidate will have an MD or MD/PhD and will have demonstrated leadership experience in academic medical center setting.

For additional information regarding the Department of Medicine at NYU School of Medicine please visit: http://medicine.med.nyu.edu/

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Mayo Clinic offers a highly competitive compensation package, which includes exceptional benefits, and has been recognized by Fortune magazine as one of the “100 Best Companies to Work For.”

To apply and learn more about this position, Mayo Clinic and Rochester, MN, please visit www.mayoclinic.org/scientist-jobs/ and reference job posting number 8133BR. Applications should include a letter of intent, curriculum vitae and bibliography and a statement of research interests. Specific questions related to the position should be directed to:

David O. Warner, M.D.
Chair, Search Committee
Mayo Clinic
200 First Street SW • Rochester, MN 55905
E-mail: warner.david@mayo.edu

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The NYU School of Medicine announces its search for the next Chair of the Department of Medicine. This is an exceptional opportunity to lead a preeminent department in a world-renowned academic medical center in New York City and to work in close collaboration with the other schools and colleges of New York University.

Chairperson, Medicine

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The Chair of the Department of Medicine will drive the vision, strategy and development of the department in the important areas of clinical care, education and research. The candidate will be responsible for leading recruitment efforts and should have demonstrated experience in business development related to service lines and innovative clinical programs. Candidates should have a distinguished record of scientific achievements, the ability to foster collaborations and promote innovation and creativity. The successful candidate will have an MD or MD/PhD and will have demonstrated leadership experience in academic medical center setting.

For additional information regarding the Department of Medicine at NYU School of Medicine please visit: http://medicine.med.nyu.edu/

Applications and nominations with accompanying curriculum vitae should be sent electronically, for confidential review by the search committee, to: Andrea Botta, Project Coordinator for Education, Faculty and Academic Affairs, andrea.botta@nymc.org.

The NYU School of Medicine was founded in 1841 and is an equal opportunity, affirmative action employer and provides a drug-free and smoke-free workplace.
ACADEMIC DEPARTMENT CHAIR OF PSYCHIATRY AND MEDICAL DIRECTOR OF CENTER FOR BEHAVIORAL MEDICINE

The Missouri Department of Mental Health (DMH) and the School of Medicine at the University of Missouri-Kansas City (SOM) has initiated a national search for the next Chair of the Department of Psychiatry and Neurosciences (DPN). The Chair position includes responsibilities as Medical Director for the Center for Behavioral Medicine, a 65 bed DMH inpatient facility and a 68 bed residential program in Kansas City.

The successful applicant will oversee and provide leadership for all academic, clinical and research activities of the department, reporting directly to the Dean. There are currently over 40 full-time faculty members and 24 trainees in a general psychiatry residency program. Minimum qualifications are board certification in psychiatry and a distinguished record of clinical excellence, teaching and scholarly activity. We are seeking a Chair who has strong leadership skills in an academic setting and experience in research administration and program development.

Faculty members are employed by a number of health care organizations in the metro area, but report directly to the Chair regarding their academic appointment and service to the Department and the School of Medicine. The ability to work collaboratively with community partners in fulfilling the clinical, teaching and research missions of the department and expanding opportunities for these activities will be a crucial skill.

The Center for Behavioral Medicine serves a diverse population and maintains partnerships with a wide array of provider systems in the community. The Medical Director provides leadership in fostering these important clinical and academic linkages.

UMKC is an equal access, equal opportunity, affirmative action employer that is fully committed to achieving a diverse faculty and staff.

Applications will be accepted until the position is filled.

Contact Information:
Interested parties should combine all application materials (personal letter of interest with accompanying curriculum vitae and a list of references) into one PDF or Microsoft Word document; upload as an attachment in the UMKC career opportunities application at: http://www.umkc.edu/hr/career-opportunities/job-posting-search-academic.aspx
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Vitamin Supplements Do Not Reduce Risk of Skin Cancer Occurrence or Recurrence

Clinical Question
Do vitamins or other supplements with antioxidant properties reduce the risk of primary skin cancer or the risk of a secondary recurrence?

Bottom Line
This meta-analysis found no evidence of a benefit from vitamins or supplements with antioxidant properties in reducing the risk of primary skin cancer or secondary recurrence. (LOE = 1a)

Study Design
Meta-analysis (randomized controlled trials)

Funding
Unknown/not stated

Setting
Various (meta-analysis)

Synopsis
Vitamins and supplements with antioxidant properties are purported to prevent harmful effects of exposure to ultraviolet rays and thus reduce the risk of skin cancer. These investigators searched multiple databases, including MEDLINE, Embase, and the Cochrane Registry, along with bibliographies of relevant articles, for randomized controlled trials (RCTs) reporting the preventive effects of vitamins and supplements on skin cancer risk compared with placebo. No language restrictions were applied. Two individuals independently evaluated studies for inclusion criteria and methodologic quality using standard assessment tools. Disagreements were resolved by consensus. From a total of 398 potential articles, 10 RCTs (N = 96,152) met inclusion criteria. Both the mean and median treatment and follow-up were within 6 months and 12.9 years. Overall, vitamin supplementation was not associated with a decreased incidence of skin cancer. In subgroup analysis, no significant protection was found from independent supplementation with beta-carotene, vitamin A, acitretin, isotretinoin, vitamin E, or a multiple vitamin. In addition, there was no protection noted for either primary or secondary prevention of skin cancer or for any type of skin cancer independently. Limiting the analysis to only the highest-quality studies did not change any results. Formal analyses found no evidence of publication bias or heterogeneity of results.

REFERENCE

Varenicline Increases Risk of Adverse Cardiovascular Events

Clinical Question
Does varenicline increase the risk of serious adverse cardiovascular events?

Bottom Line
Varenicline increased the risk of adverse cardiovascular events in the participants of 14 clinical trials, despite the fact that these trials typically excluded patients with known
heart disease. The authors apply the relative risk of 1.72 to a patient with known heart disease and estimate a number needed to treat to harm of 28 for patients with heart disease (95% CI, 13-213). This drug should be used with caution in patients with or at high risk for cardiovascular disease, particularly since there are alternative pharmacologic approaches for these patients. (LOE = 1b-)

Study Design
Meta-analysis (randomized controlled trials)

Funding
Government

Setting
Outpatient (any)

Synopsis
Smoking is bad for you, no doubt, so quitting is a good thing. However, previous reports have described an increased risk of adverse cardiovascular events among users of varenicline. This systematic review provides the best estimate to date of the extent of that risk. These authors identified all double-blinded, randomized controlled trials that compared varenicline with placebo for smoking cessation and reported at least 1 adverse cardiovascular event or death. They included 14 studies with a total of 8217 patients. Most studies were of high quality, with adequate randomization, allocation concealment, masking, follow-up, and reporting of adverse events. The studies treated patients with varenicline for between 8 and 12 weeks and then followed up patients for a total of between 24 and 52 weeks. There was no evidence of publication bias (ie, not publishing small studies or those with negative findings). The mean age of patients was approximately 43 years, and the majority were male. The studies were consistent in their results, and the weighted odds ratio of an adverse cardiovascular event in patients randomized to receive varenicline was 1.72 (95% CI, 1.1-2.7).

REFERENCE

Smoking Cessation Counseling for Pregnant Women Lacks Effectiveness

Clinical Question
Is smoking cessation counseling effective for women during pregnancy?

Bottom Line
If smoking cessation counseling in pregnancy improves quit rates among pregnant women at all, the effect is small and as yet unproven. (LOE = 1a-)

Study Design
Meta-analysis (randomized controlled trials)

Funding
Government

Allocation
Concealed

Setting
Various (meta-analysis)

Synopsis
The authors of this meta-analysis identified 8 randomized controlled trials of counseling interventions for smoking cessation among pregnant women (N = 3290). In 6 trials, the intervention was face-to-face counseling, which varied from 3 to 9 sessions. Three studies reported the time spent in counseling, which ranged from 180 to 600 minutes but may not be representative of the other studies. Two trials were of telephone counseling interventions. All studies used the quit rate at the 6-month follow-up as the outcome measure, which had to be biochemically validated with expired carbon monoxide or salivary cotinine measurement. The proportion of women who remained abstinent at the end of follow-up was modest, and the differences between the intervention and control arms did not exceed 4% in any of the studies. The calculated summary odds ratio was nonsignificant (1.08; 95% CI, 0.84-1.40). Heterogeneity among studies was high.

REFERENCE

Daily Probiotic with Lactobacillus casei Reduces Upper RTI Duration in Elderly People

Clinical Question
Does a fermented probiotic (Lactobacillus casei) reduce the incidence or duration of common acute infections in the elderly?

Bottom Line
This randomized controlled trial found that acute upper respiratory tract infections (RTIs) in elderly patients taking daily doses of Lactobacillus casei were approximately 3 days shorter than in those taking a control product, though the mechanism remains unclear. (LOE = 1b)

Study Design
Randomized controlled trial (double-blinded)

Funding
Industry

Allocation
Concealed

Setting
Outpatient (any)
Clinical Question
Which drugs are most effective for treating patients with acute mania?

Bottom Line
In general, 3 weeks of antipsychotic medications are more effective and better tolerated than mood stabilizers in treating patients with acute mania. However, it is not clear if the differences are clinically meaningful. (LOE = 1a)

Study Design
Meta-analysis (randomized controlled trials)

Funding
Self-funded or unfunded

Setting
Various (meta-analysis)

Synopsis
These researchers searched multiple databases and clinical trial registries to identify randomized double-blind trials comparing active antimanic drugs with placebo or with another active antimanic drug. Three authors independently assessed studies for inclusion, with discrepancies resolved by discussion. The same teams also assessed study quality and extracted the data. When the reporting was incomplete, they contacted the primary authors and manufacturers. Ultimately, the researchers identified 68 trials with more than 16,000 patients. The study drugs included: aripiprazole (Abilify), asenapine (Saphris), carbamazepine (Tegretol), valproate (Depakene, Stavzor, Depacon), gabapentin (Neurontin), haloperidol (Haldol), lamotrigine (Lamictal), lithium (Eskalith, Lithobid), olanzapine (Zyprexa), quetiapine (Seroquel), risperidone (Risperdal), topiramate (Topamax), and ziprasidone (Geodon). Most studies were small (average = 106 patients per group) and of short duration (mean = 3.4 weeks). Most of the patients had moderate to severe mania, and approximately 75% of the studies took place in inpatient settings. The researchers rated most studies as having good quality. The primary outcome measures were scores on a mania rating scale (efficacy) and drop-out rates (tolerability). The authors did not report what a clinically meaningful change on the mania score would be. They also used the proportion of patients who responded to treatment (not defined) as a secondary outcome. This paper has a ton of data, charts, and graphs. Since they give us no reference as to clinical relevance, I won’t bore you other than to place a caveat on the overall conclusions. In head-to-head studies, risperidone and olanzapine were similar in effectiveness and were more effective than other agents. Patients taking olanzapine, risperidone, and quetiapine were less likely to stop taking the medication. The authors do not provide enough data to estimate numbers needed to treat for benefit or for harm.

REFERENCE

Adjuvant Increases Efficacy of Influenza Vaccine in Infants and Children

Clinical Question
Does an adjuvant improve efficacy of influenza vaccine in young children?

Bottom Line
Influenza vaccine that uses an adjuvant is safe and reduces the risk of influenza among children aged 6 to 72 months compared with standard influenza vaccine. (LOE = 1b)

Study Design
Randomized controlled trial (single-blinded)

Funding
Industry
Allocation
Concealed

Setting
Outpatient (any)

Synopsis
Although infants are at high risk of complications if they get influenza, they tend to have a less vigorous immune response to influenza vaccine. In this study, vaccination was given with a oil-in-water emulsion adjuvant called MF59. These investigators randomized 4707 children, aged 6 to 72 months, in Finland and Germany during the 2007-2009 flu seasons to either adjuvant trivalent inactivated influenza vaccine (ATIV), trivalent influenza vaccine (TIV), or a control vaccine in a 2:1:1 ratio. The control group received a meningococcal or tick-borne encephalitis vaccine. For the first year, the TIV was a subunit vaccine from Novartis, and for the second year it was a split vaccine from GlaxoSmithKline. The authors report the results in terms of relative efficacy for comparisons among the 3 groups. I find that not terribly helpful clinically; it’s not unlike using relative risk reduction instead of absolute risk reduction. So, let’s look at the absolute benefit: There was no significant difference between TIV and control for infants aged 6 to 36 months or 36 to 72 months. ATIV was more effective than control in infants and children aged 6 to 72 months. There were 13 cases of influenza in 1937 patients receiving ATIV compared with 47 cases in 993 patients receiving control (0.67% vs 4.7%; number needed to treat [NNT] = 25). The benefit appeared to be somewhat greater in children aged 36 to 72 months (0.47% vs 5.85%; NNT = 18.6), compared with infants aged 6 to 36 months (0.82% vs 3.9%; NNT = 32). The NNT for ATIV vs TIV was 46. Unfortunately, tests of statistical significance for these absolute differences are not provided. There were no clinically meaningful differences among groups regarding adverse events.

REFERENCE
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