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*J Neurol Neurosurg Psychiatry* 2010 81: 768-770
doi: 10.1136/jnnp.2009.177519

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Patterns of non-traumatic myelopathies in Yaoundé (Cameroon): a hospital based study

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ABSTRACT

BACKGROUND The relative frequency of compressive and non-compressive myelopathies and their aetiologies have not been evaluated extensively in most sub-Saharan African countries. The case of Cameroon is studied.

METHODS Admission registers and case records of patients in the neurology and neurosurgery departments of the study hospital were reviewed from January 1999 to December 2006.

RESULTS 224 (9.7% of all admissions) cases were non-traumatic paraplegia/paraparesis or tetraplegia/tetraparesis and 147 were due to myelopathies, representing 6.3% of all cases admitted during the study period and 65.6% of cases of paraplegia or tetraplegia; 88% were compressive myelopathies. Aetiologies were dominated by primary and secondary spinal tumours (mainly prostate carcinoma, lymphoma and liver carcinoma) that each accounted for 24.5% of cases. Other causes included spinal tuberculosis (12.3%), tropical spastic paraparesis (five positive for human T cell lymphotrophic virus (HTLV)-I and one for HTLV-II) (4.8%), spinal degenerative disease (4.1%), acute transverse myelitis (4.1%), HIV myelopathy (1.4%), vitamin B12 deficiency myelopathy and multiple sclerosis (0.7%). No aetiology was found in 21.1% of participants.

Conclusions Myelopathies in our setting are dominated by spinal compressions. Metastasis is a leading cause of spinal cord compression with liver carcinoma being more frequent than reported elsewhere. Infections nevertheless remain a major cause of spinal cord disease and both cancers and infections constitute public health targets for reducing the incidence of myelopathies.

BACKGROUND Myelopathies are common neurological diseases with high morbidity (up to 79% of patients will definitely remain disabled) and high mortality.1–3 Earlier studies from sub-Saharan Africa identified tuberculosis as the main cause.2,4 With the ageing of the population in sub-Saharan Africa, a much higher proportion of malignant myelopathies is expected. However, the HIV pandemic may also modify the aetiological distribution of myelopathies. Although these recent changes have been suggested, very few studies have focused on this condition. Accordingly, we have reviewed the spectrum of myelopathies in the largest neurological referral centre in Cameroon.

METHODS We reviewed the admission registers of the neurology and neurosurgery departments of Yaoundé Central Hospital from January 1999 to December 2006. All cases of non-traumatic paraplegia (or paraparesis) and tetraplegia (or tetraparesis) were examined and data collected on age, sex, evidence of myelopathy, mechanisms of disease (compressive or non-compressive type) and final diagnosis. A diagnosis of myelopathy was arrived at using the diagnosis algorithm available in the two services (figure 1). Neuroimaging findings provided additional arguments for spinal cord compression (SCC). Patients were classified as having compressive (CM) or non-compressive (NCM) myelopathies based on myelography/computerised myelography results, or on surgical findings for those who underwent surgery following standard radiographic findings. A spinal osteolytic lesion with clinicoradiological correlation was also taken as proof of SCC. For those with a CM, an aetiological diagnosis was established based on histological analysis of the surgical specimen or argument of probability for those with a known primary tumour or biological tumour markers, mainly prostatic specific antigen, z-fetoprotein and stigmata of myeloma. In addition, clinical improvement after antituberculosis treatment was considered an indicator of tuberculous origin. In patients with NCM, steps towards aetiological diagnosis included CSF analysis, with the presence of more than 5 white cells/mm3 of CSF considered as evidence of inflammation/infection. In the neurology department, for the past 7 years, we have routinely systematically checked for the presence of antibodies against the human T cell lymphotrophic viruses (HTLV) type I and type II in the sera of patients with NCM. Other biological markers were also requested as guided by clinical findings. Acute transverse myelitis was diagnosed using modified criteria from the Transverse Myelitis Consortium Working Group.4

Data were analysed using SPSS statistical software (V11 for windows). The results are reported as mean (SEM) for variables following a normal distribution and as median (range) for other data (percentages and proportions). Qualitative variables, sex, type of motor deficit and presence of sphincteric dysfunction were compared using the χ2 test while sensory levels were compared using the Fisher exact test. Except for delays before admission which were compared using the Mann–Whitney U test, all quantitative variables followed a normal distribution and were therefore compared using the Student’s t test. The level of significance was set at p<0.05.

RESULTS From January 1999 to December 2006, 2313 patient records were available in the registers of the neurology and neurosurgery departments. A total
of 224 (9.7% of all admissions) cases were non-traumatic paraplegia/paraparesis or tetraplegia/tetraparesis and 147 were due to myelopathies, representing 6.3% of cases admitted during the study period. Imaging studies included 57 standard myelographies (86% showed compression in the CM group) and 71 computerised myelographies (all showed compression in the CM group). Radiography was the only investigation done in 27 patients (40% were conclusive for the diagnosis of CM). Details were available for classification as CM and NCM for 144 (97.7%) of all admissions in our study. There was an advantage of admission to consultation (in days; median (max; min)) to consultation (in days) in four recent hospital based African studies. Balogou et al.5 in a multicentre study conducted from 1987 to 1991 in neurological services of six African countries. In another hospital based study conducted from 1990 to 1995 in Ethiopia, Zenebe et al. reported a high proportion (18%) of patients with myelopathy among those presenting with neurological diseases. Lower prevalences of myelopathies have been reported in more recent hospital based African studies. Baloğou et al.5 in Togo and Chapp-Jumbo in Nigeria found, respectively, 10.4% of cases of paraplegia and 6.5% of patients with myelopathies in neurological wards. Age and sex distribution of participants with CM and NCM are shown in Table 1. Participants in our study were similar to other African series.23,7

Underlying aetiological entities among our participants with myelopathy were dominated by primary and secondary spinal tumours, accounting for 24.5% of cases each. No aetiology was found in 21.1% of cases. Other causes included spinal tuberculosis (12.9%), tropical spastic paraparesis (4.8%), spinal degenerative disease (4.1%) and acute transverse myelitis (4.1%). HIV myelopathy (1.4%), combined degenerative myelopathy and multiple sclerosis (0.7%) accounted for the remaining cases. HTLV-I serology was positive in five out of seven patients with tropical spastic paraparesis and one patient was seropositive for HTLV-II.

Although men regularly outnumbered women, apart from spinal metastasis (p=0.048), no statistical difference was found in the sex distribution between aetiological groups for patients with CM. Among the four leading aetiological subgroups, patients with spinal metastasis and degenerative spinal diseases were relatively older compared with those with tuberculosis and primary spinal tumours; nevertheless the difference was significant only for metastasis (p value between groups=0.002). Patients with primary spinal tumours were also significantly younger than those in other aetiological groups (p=0.044).

The primary tumour in patients with spinal metastasis was dominated by lymphoma (10 cases), prostate carcinoma (nine cases) and hepatocellular carcinoma (eight cases). In the remaining patients with spinal metastasis, the primary tumour originated from the lungs (two cases) and the breasts (one case). No origin was found in five patients with metastatic spinal carcinoma. Nerve sheath tumours (shwanoma and meningioma) and plasmocytoma were predominant in the group of patients with primary spinal tumours (35.3% and 22.2%, respectively). Other primary spinal tumours/pseudotumours included lipoma (four cases), medulloblastoma, ependymoma (two cases each), oesome, chondromyxoma, osteodystrophic fibrosis, angiosarcoma, aneurismal cyst and Ewing sarcoma (one case each).

### DISCUSSION

This study of non-traumatic spinal cord diseases in Cameroon is among the very few dedicated to myelopathies in sub-Saharan Africa, particularly in the era of retroviral epidemic. Paraplegia/ tetraplegia and myelopathies were found in 9.7% and 6.3%, respectively, of all admissions in our study. There was an earlier report of a high prevalence of myelopathies (22.7%) by Preux et al.5 in a multicentre study conducted from 1987 to 1991 in neurological services of six African countries. In another hospital based study conducted from 1990 to 1995 in Ethiopia, Zenebe et al. reported a high proportion (18%) of patients with myelopathy among those presenting with neurological diseases. Lower prevalences of myelopathies have been reported in more recent hospital based African studies. Baloğou et al.5 in Togo and Chapp-Jumbo in Nigeria found, respectively, 10.4% of cases of paraplegia and 6.5% of patients with myelopathies in neurological wards. Age and sex distribution of participants in our study were similar to other Africans series.2,3,7 Clinical presentation of our patients did not differ from previous reports of paraplegia in both developing and developed countries; sensory level mainly dorsal and sphincter dysfunction being the dominant features.5,8,9 While delay before neurological consultation has consistently been reported as long in African series, in developed countries this delay is shorter and probably reflects a higher level of awareness and industrialisation.2,8,9 Patients with CM consulted earlier probably because the pain is more severe in SCC.

The three main spinal metastases were lymphoma, prostate cancer and liver cancer, accounting for 77% of all secondary spinal tumours. Unlike developed countries, breast and lung spinal...
metastases were rarely found in our patients.\textsuperscript{8,9} Lung cancer seems to be rare in our environment, as previously highlighted by Mbakop et al.\textsuperscript{10} Compared with western countries, spinal metastases of liver cancer was relatively higher in our study. The high prevalence of this cancer in developing countries where viral hepatitis C and B are endemic could partly explain this peculiarity.\textsuperscript{10}

Tuberculosis was the third commonest cause of myelopathies observed among our participants with the CM type. Tuberculosis is the leading cause of myelopathies in many developing countries, with prevalence ranging from 20\% to 54\%.\textsuperscript{2,3,6} Although the prevalence of tuberculosis in Cameroon is high, it is among the lowest in the sub-Saharan African continent.\textsuperscript{11,12} HIV myelopathy has increasingly been recognised as a cause of myelopathy, especially in HIV endemic areas, with reported prevalence ranging from 3\% to 16.9\%.\textsuperscript{3,6,13} HIV myelopathy, however, was less frequent in our sample. Other retroviral infections, mainly HTLV-I and II, sharing the same route of transmission with HIV, have been associated with spastic paraparesis in sub-Saharan Africa.\textsuperscript{5} It is expected that future observations of infections, mainly HTLV associated myelopathies and possibly other myelotropic infectious/viral agents in Africa.

CONCLUSION
Myelopathies are frequent in our environment with spinal CM outnumbering NCM. Metastatic spinal cord compressions is becoming a leading cause of cord compression, with liver carcinoma being more frequent than in other parts of the world. Infectious myelopathies (especially tuberculosis and retroviral infections) nevertheless still remain common.

Study limitations
We are well aware of the limitations of this study, in particular its retrospective nature and the absence of MRI. We have standardised the approach of patients with suspected myelopathies so as to best arrive at the aetiological diagnosis, despite the limited imaging equipment. The use of MRI may have reduced the number of patients with no definitive diagnosis although in centres equipped with MRI, this figure is still up to 16.5\% of patients with acute myelopathy.\textsuperscript{14}

Competing interests None.

Ethics approval Ethics committee approval was obtained.

Contributors All authors designed the study, collected data and wrote the discussion. In addition, AZLL and APK performed the statistical analyses.

Provenance and peer review Not commissioned; externally peer reviewed.

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