

GROUP NO: 1
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INTRODUCTION

Summation of contraction represents the contractile response of the skeletal muscle following the application of at least 2 stimuli before contraction period elicited by the first stimulus ended (15 – 20 msec).

Considering the possibility that we can apply two stimuli according to the announced theory, the second stimulus can find the muscle in one of the 3 phases of the twitch. Indeed, there are 3 possibilities that we can observe, leading to 3 different myograms:

1. The second stimulus finds the muscle in the latent period: there is no result, the muscle is not excitable during this phase
2. The second stimulus finds the muscle in the contraction period: we observe a greater response, but the 2 twitches are incompletely fused
3. The second stimulus finds the muscle in the relaxation period: we observe a specific aspect of the myogram, the 2 twitches are partially fused (the relaxation period of the 1st twitch is interrupted by the intervention of the second the stimulus)

In conclusion, regarding the moment of appearance of the second stimulus, the composed contraction can follow one of the next 2 patterns:

- a. Incomplete tetanus occurs when every second stimulus finds the muscle in the relaxation period.
- b. Complete tetanus occurs when every second stimulus finds the muscle in the contraction period.

OBJECTIVES

Study the summation of contractions of the skeletal muscle and analyze the resulting myograms.

Principle

Apply a complex of stimuli with different frequencies on the skeletal muscle, recording the resulting myograms on a graphical surface.

METHODOLOGY

Session 1: Myogram of complete tetanus

1. Set the frequency of the stimuli at 20 stimuli/sec with the right buttons
2. Apply a complex of stimuli for 5-6 secs
3. Analyze the resulting myogram

Session 2: Myogram of incomplete tetanus

1. Set the frequency of stimuli at 10 per sec.
2. Apply a complex of stimuli for 5-6 sec
3. Analyze the resulting myogram
4. Repeat all steps at 6.5 and 5 stimuli/sec

OBSERVATIONS AND DISCUSSIONS

1. Describe the myogram at:

- a. 20 stimuli/sec

the myogram projected a steep upward slope. after it reached its peak (maximal threshold), it had a slowly decreasing slope until it reached the point where it is only a straight line. it resulted to a complete tetanus.

- b. 10 stimuli/sec

the myogram projected several decreasing "mound-like" curves with no space in between each new curve which are also decreasing as the stimulus is applied to the muscle until it becomes a straight line. incomplete tetanus occurs in this activity.

- c. 6.5 stimuli/sec

the myogram projected three "mountain-like" curves which are decreasing as stimulus is applied and leans to the left than to the right. the curves decreases in height until it becomes a straight line. incomplete tetanus still occurred and there is a fusion of two muscle twitches.

- d. 5 stimuli/sec

the myogram projected two sets of curve and as time passes by, the height of the curve decreases until it reached the point where it already is a straight line. incomplete tetanus occurred but there is an incomplete fusion of the twitches because the stimuli was applied to the contraction period.

2. What differences did you observe in the myogram of the different stimulus frequency? What do these differences mean?

i noticed that as the applied stimulus frequency decreases, bigger curves were generated. there is also a difference after the second stimulus was elicited which caused changes with the contraction, relaxation, and later period in muscle contraction.

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3. What similarity did you observe on the different myograms? What does this mean?

the myograms with different frequency all resulted to an incomplete tetanus. but after the second stimulus was applied, it isn't always found in the muscle relaxation period and contraction occurs.
