

GROUP NO: 3

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INTRODUCTION

There are 3 structures implicated in generating the contraction of the skeletal muscle:

1. Motor neuron
2. Motor end plate
3. The skeletal muscle fiber

Among these structures, only the motor neuron never gets tired. It is practically infatigable. The other 2 structures develop tiredness but due to other reasons, of course. The neuromuscular synapse gets tired due to the depletion of the neurotransmitter. The muscle fatigues due to accumulation of metabolites in the structure and depletion of the energetic substratum.

OBJECTIVE

To demonstrate the fact that the neuromuscular junction gets tired before the muscle does.

Principle:

Application of a series of electrical stimuli on the motor neuron of a skeletal muscle, while recording the resulting myogram, until the muscle does not contract anymore. After this, electrical stimuli is then applied on the muscle.

METHODOLOGY

Part I

1. Push the "indirect stimuli" button so that the electrical stimuli will be applied on the motor neuron (and not on the muscle itself)
2. Click the right button to apply stimuli
3. Observe the myogram closely noting the decrease in the amplitude of the contractios
4. Click the clear screen.

Part II

5. Switch to the "direct stimuli" by pressing on the button so that the electrical stimulation will be directly on the muscle.
6. Click the right button to again, apply a complex a stimuli.
7. Again, observe the myogram until the muscle stops contracting.

DISCUSSION QUESTIONS

1. Describe your observations on the myogram in the 1st part of this exercise. What does the cessation of contraction mean? What could be the possible reason for this?

On the indirect stimuli, the amplitude of the contractions decreases. The cessation of contraction means that the neuromuscular synapse (motor end plate) gets tired. The possible reason for this is due to the chemical mediator depletion from the presynaptic membrane.

2. Describe your observations on the myogram in the 2nd part of this exercise. What does the cessation of contraction mean? What are the possible mechanisms of this?

On applying direct stimuli, the amplitude of the contractions decreases slowly than the first part of the exercise. That cessation of contraction means that the muscular fatigued. This may be due to the depletion of the energetic substratum.

3. What difference have you noticed between the myograms when stimulus complex is applied directly and indirectly? What can you conclude with this observation?

When the stimulus complex is applied in directly, the amplitude of the contraction slowly decreases than in the indirect. I further conclude that it has to do with the function of the motor neuron, in which it never gets tired compared on the muscle itself that experiencing muscle fatigue.

VPHY 50: General Physiology Laboratory Exercises
