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BIO 125

10/10/23

Laboratory 9 – Muscle Physiology

Purpose:

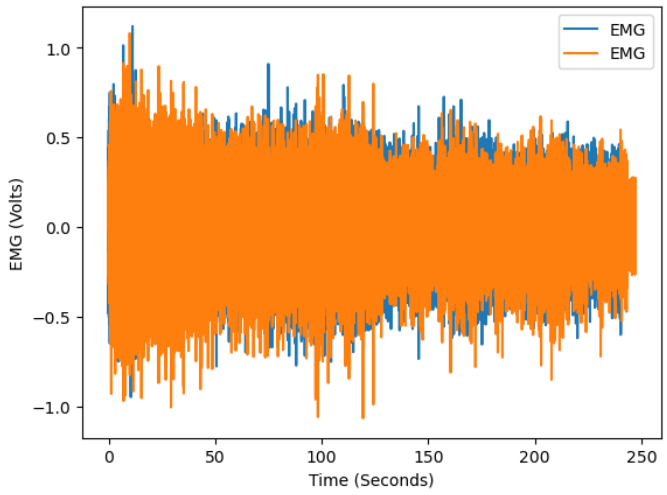
The purpose of laboratory 9- Muscle Physiology, was to perform several experimental procedures in order to investigate the different contraction characteristics of skeletal, cardiac, as well as smooth muscle. In this lab there was a demonstration of the electromyograph that demonstrated the concepts of agonist, antagonist, and synergist muscles. The lab also demonstrated the effects of oxygen supply on skeletal muscle activity.

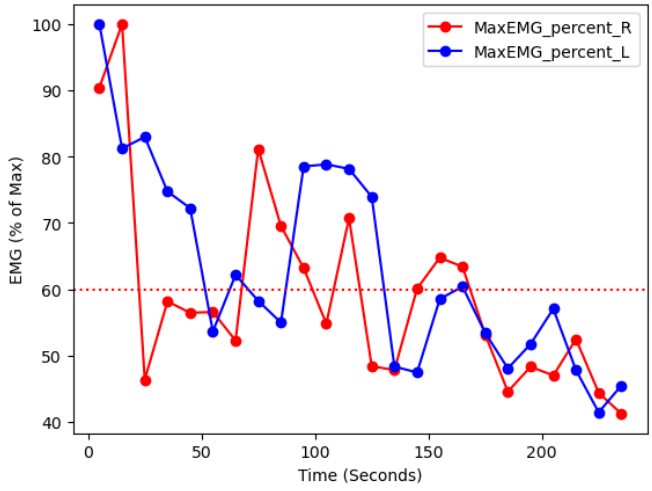
Procedure:

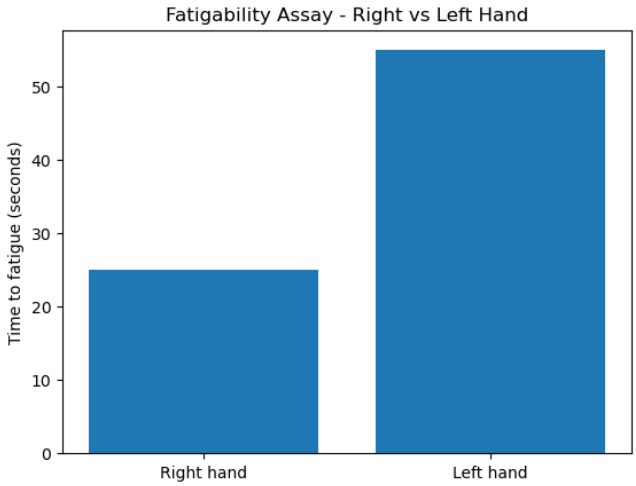
9-D: Demonstration of the electromyograph (EMG)

- Connect IWX/214 unit and open Labscribe3 program to generate electromyograph
- The subject must remove all jewelry and clean their skin that will be used. After the area dries place the electrode to the six locations.
- Place electrodes from proximal to distal on the forearm in this order: +2, -2 on posterior and +1,-1 and ground on the anterior. Snap the lead wires onto the electrodes in this order: red "+1" lead is attached to the proximal electrode on the anterior surface. Black "-1" lead is attached to the distal electrode on the anterior forearm. Green "C" lead (the ground) is attached to the remaining electrode on the anterior surface. White "+2" lead is attached to the proximal electrode on the posterior forearm. Brown "-2" lead is attached to the distal electrode on the posterior surface.
- Record an EMG of the muscles of the forearm that illustrates agonistic and antagonistic muscle activity for each exercise.
    a. Flex the wrist with palm open and hold for four seconds. Return wrist to neutral position. Extend the wrist and hold for four seconds several times.
    b. Forcefully flex the wrist with hand closed into a fist for four seconds. Return to neutral position. Extend the wrist maintaining a fist for four seconds several times.
    c. Flex wrist against resistance applied by another student for 10 seconds.
    d. Place the hand in mid-supination and make a fist. Move hand upwards against resistance applied by another student for 10 seconds

Results:


EMG
EMG
EMG (Volts)
Time (Seconds)


MaxEMG_percent_R
MaxEMG_percent_L
EMG (% of Max)
Time (Seconds)


Fatigability Assay - Right vs Left Hand
Time to fatigue (seconds)
Right hand
Left hand

Discussion:

In this lab, different phases of typical skeletal muscle twitch were identified by performing these different exercises. The exercise that I felt demonstrated the most was pressing/flexing my wrist against another student because it showed more activity happening and it took more strength/power to try and go against the resistance.

Conclusion:

In conclusion, I believe this lab achieved its goal of demonstrating the different aspects of how muscle twitching works as well as being able to distinguish the EMG of a partially contracted muscle from a fully contracted muscle. I definitely learned a lot from this lab and what the EMG represents and how it demonstrates different aspects.