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Laboratory 9 - Muscle Physiology
10/9/23

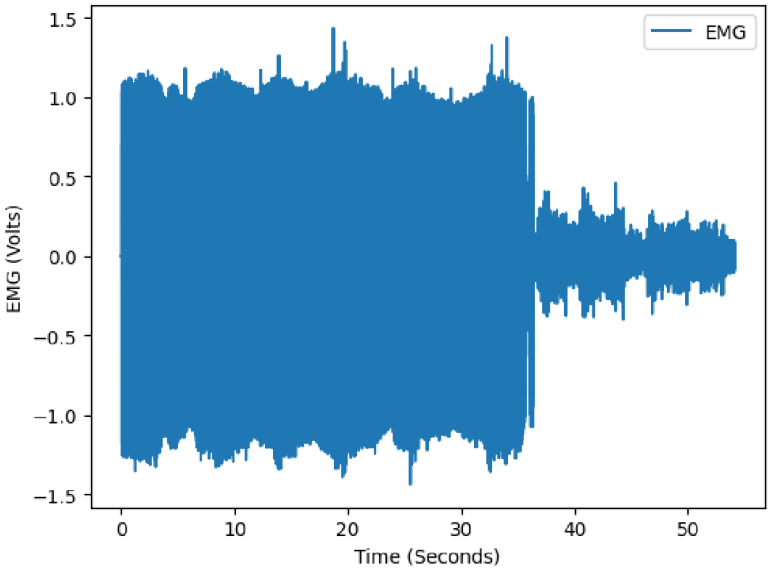
Purpose

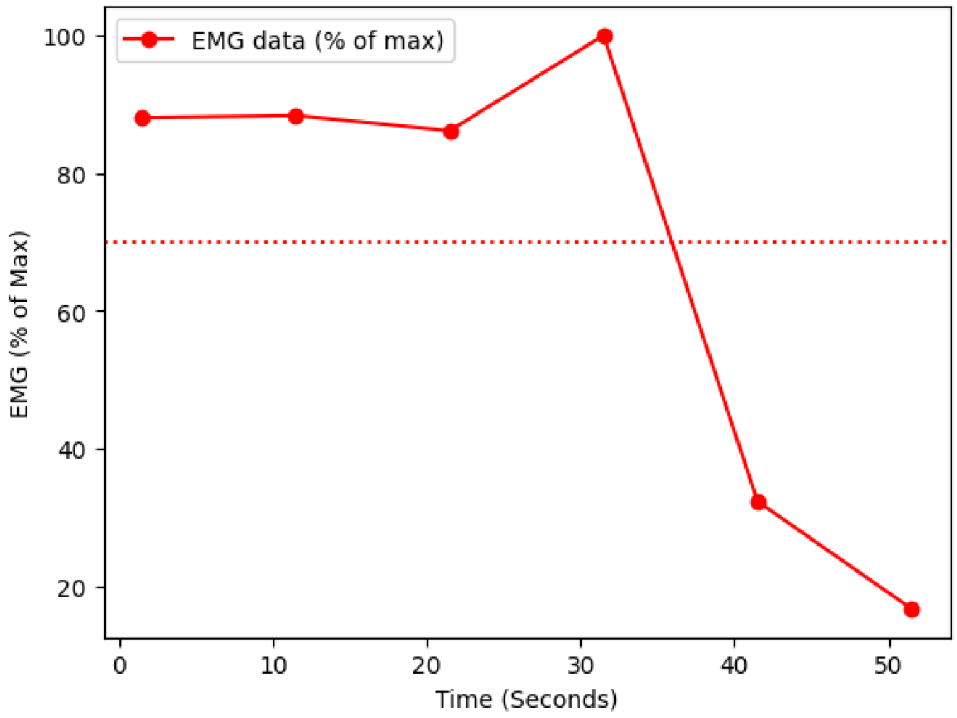
Myology is the study of muscle and it focuses on investigating the performance of skeletal, cardiac, and smooth muscle. All muscle cells differ in their degree of innervation, rate and duration of contraction, fatigue rate and response to neurotransmitters. In laboratory 9, we will use a procedure to investigate the different contraction characteristics of skeletal, cardiac, and smooth muscle. The purpose of this laboratory nine is to be able to identify the phases of a typical skeletal muscle twitch and the waveforms of the skeletal muscle exercises.

Procedure

To get things started, before turning anything on, be sure the IWX/214 unit is plugged in, and that IWX/214 unit is connected to the laptop by USB cable. Be sure that the color-coded lead wires are correctly inserted in the lead pedestal of the C-AAMI-504 EEG cable. Once everything is connected, turn on the laptop and allow it to fully boot up before you turn on the IWX/214 unit. Open the labscribe program by clicking on the labscribe 3 icon on the desktop. Then click on the tab that should lead you to a second tab called “Antagonistic Muscle” After we had it all set up, I removed my watch from my wrist and my partner used an alcohol swab to clean my skin, she then applied the electrodes to six locations. The red lead is attached to the proximal electrode on the anterior surface. The black lead is attached to the distal electrode on the anterior forearm. The green lead is attached to the remaining electrode on the anterior surface. The white lead is attached to the proximal electrode on the posterior arm. The brown lead is attached to the distal electrode on the posterior surface. After all the leads are set up correctly, record an EMG of the muscles of the forearm illustrating agonistic and antagonistic muscle activity. Make sure to type the students name and begin recording. First I gently flexed my wrist with the palm open and held that position for four seconds, then I returned the wrist to a neutral position, after I extended the wrist again with the palm open, and held that position for four seconds. I repeated this two times. After I forcefully flexed the wrist with the hand closed into a fist, I held that for four seconds, and then returned to a neutral position. I repeated it two times. Finally I placed my hand in mid-supination and made a fist. I attempted to move my hand upwards while my partner applied resistance. We held this for 10 seconds. After we evaluated the amplitude and frequency of the emg recording and made our graph. For the next part of the lab, I firmly squeezed a tennis ball as rapidly as possible with my non-dominant hand until I felt fatigued and could no longer squeeze it. My partner then recorded the duration of this effort.

Results



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Time at ~70 % of max: 41.4995 seconds
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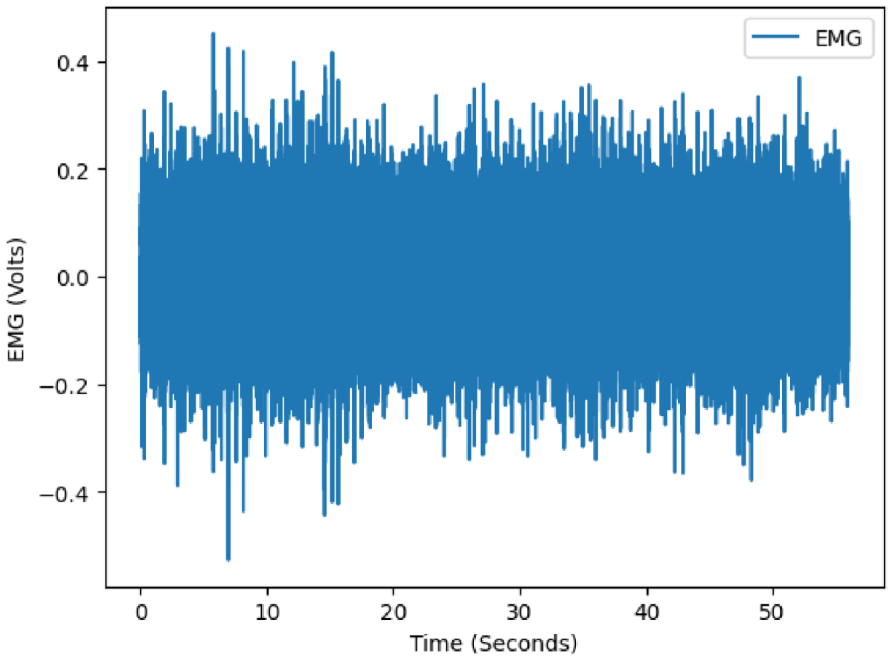

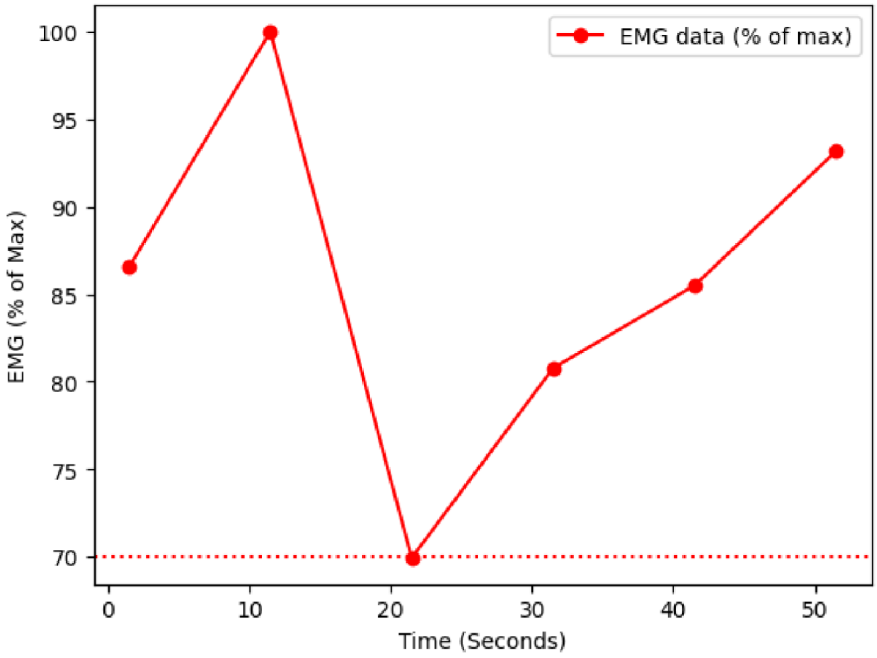

Discussion

Laboratory nine was interesting because I was able to record an EMG of my heart, and see how my EMG changed depending on the movement of my muscles. I noticed that when my wrist was forcefully moved the amplitude of the waves on the EMG got higher. I also noticed that when putting pressure on my fist the amplitude of the waves were high. The graphs were very hard for

me to make and confusing. I am thankful prof oak and my lab partners helped me make the graphs. An experimental error that may have occurred could have been if the leads were not placed correctly because this would have caused incorrect results.

Conclusion

Overall, physical muscle contraction that can be observed follows the electrical signal to the muscle to contract. These electrical signals can be recorded as electromyography and the overall work of the entire muscle during different activities can be measured and compared. EMG's demonstrate the concept of agonists, antagonist, and synergist muscles. You can learn alot about the function of someone's muscles with an EMG. EMG's help understand the movement of muscles better as well as your heart.