Central Mechanisms during Fatiguing Exercises under the influence of Cognitive Stress


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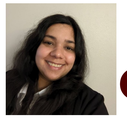
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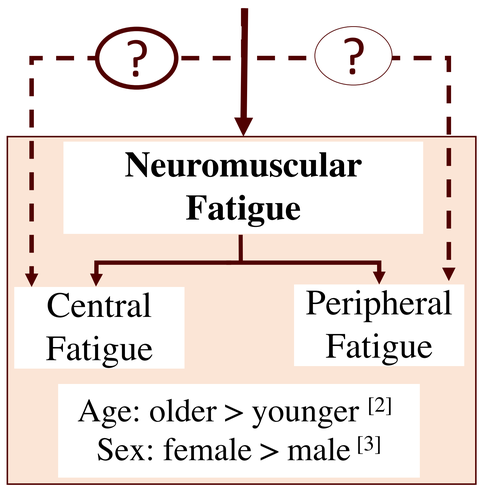
Introduction

Cognitive Stress [1] [3]



Objective

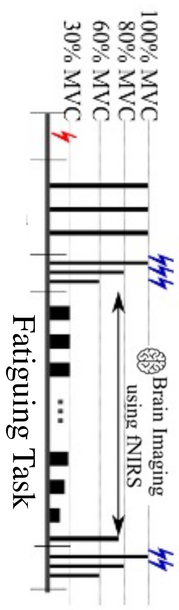
Evaluating the impact of cognitive stress on the mechanisms of neuromuscular fatigue by measuring central fatigue with and without stress

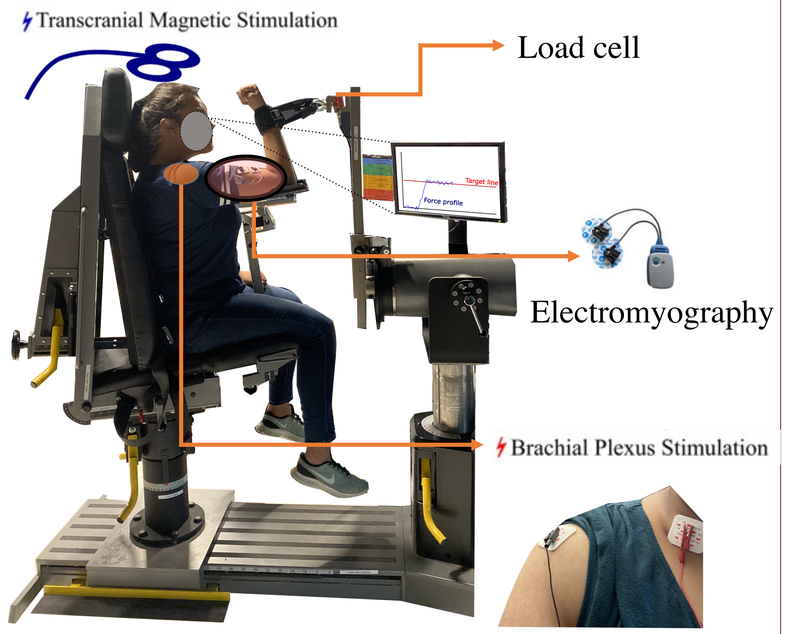
Fatiguing Protocol

Fatiguing task

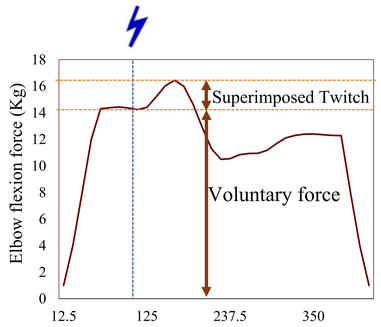
Control session	**Stress session**
Elbow flexion	Elbow flexion with math

Approach

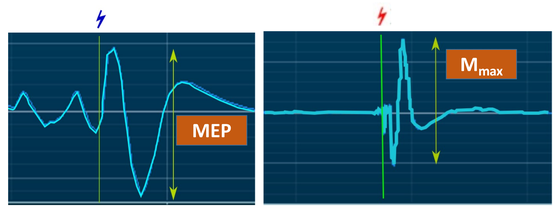




Voluntary activation Calculation



Electromyographic response to stimulation

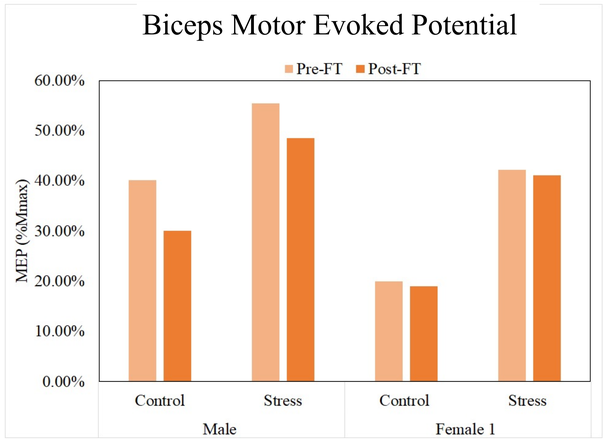


$$VA = \frac{Voluntary\ force}{Voluntary\ force + Superimosed\ twitch}$$

Preliminary Results

First data of a young male and a female subject was collected using the approved study protocol.

	Male		Female	
	C	S	C	S
Endurance Time	54 min	59 min	23.5 min	25 min
Strength loss	28.04%	16.86%	11.75%	**12.43%**
STAI increase	20%	120%	25%	90%
Voluntary Activation loss	**6.7%**	**4.8%**	**2.7%**	**4.2%**



Discussion

- As per the literature, the influence of stress on fatigue is higher for females as compared to males.
- Preliminary results show that central fatigue is higher for the stress session in females

Stress affects central mechanisms of fatigue for females

References:

[1] Arnsten, A. F. (2009). Stress signalling pathways that impair prefrontal cortex structure and function. 464 Nature reviews neuroscience, 10(6), 410-422.
[2] Clark, R. L., & Ritter, B. M. (2020). How are employers responding to an aging workforce? The Gerontologist, 60(8), 1403-1410
[3] Yoon, T., Keller, M. L., De-Lap, B. Harkins, A., Lepers, R., & Hunter, S. K. (2009). Sex 789 differences in response to cognitive stress during a fatiguing contraction. Journal of Applied 790 Physiology, 107(5), 1486-1496.

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