Central Mechanisms during Fatiguing Exercises under the influence of Cognitive Stress

Harlyn Nguyen, Oshin Tyagi, and Ranjana K. Mehta

Introduction

Cognitive Stress [1][3]

Neuromuscular Fatigue

Central Fatigue

Peripheral Fatigue

Age: older > younger [2]

Sex: female > male [3]

Objective

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

Approach

Voluntary activation Calculation

Electromyographic response to stimulation

Voluntary force

Superimposed Twitch

Elbow flexion force (Kg)

Fatiguing Protocol

Fatiguing task

Control session

Stress session

Elbow flexion

Elbow flexion with math

Preliminary Results

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

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endurance Time</td>
<td>54 min</td>
<td>23.5 min</td>
</tr>
<tr>
<td>Strength loss</td>
<td>28.04%</td>
<td>11.75%</td>
</tr>
<tr>
<td>STAI increase</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>Voluntary Activation loss</td>
<td>6.7%</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

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: