The Warm-Up Effect: Is it Similar in Children and Adults?

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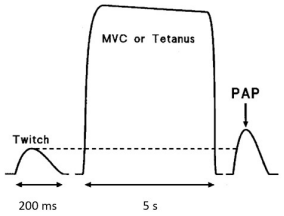
Background

- Post-activation potentiation (PAP) is the enhancement of twitch force after a **warm-up** or conditioning contraction[1].



From Sale, 2002[1]. The increase in twitch torque after a conditioning contraction is showing PAP.

- PAP is greater in muscles with a higher **type-II** muscle fibre composition[2].
- PAP is associated with a decrease in motor unit (MU) **firing rates** in adults[3].

Children:

- May have a lower type-II muscle fibre composition[4].
- May have a lower ability to volitionally activate their type-II MUs compared to adults[5].

Research Question

Are there child-adult differences in PAP and MU activation of the potentiated knee extensors?

Hypothesis

Children will have:

1) Lower PAP
2) Smaller reduction in MU firing rates during potentiated contractions.

Methods

Biodex dynamometer that will be used to measure twitch and voluntary knee extension torque.

Surface decomposition electrode and custom made stimulation pads on the knee extensors.

Who:

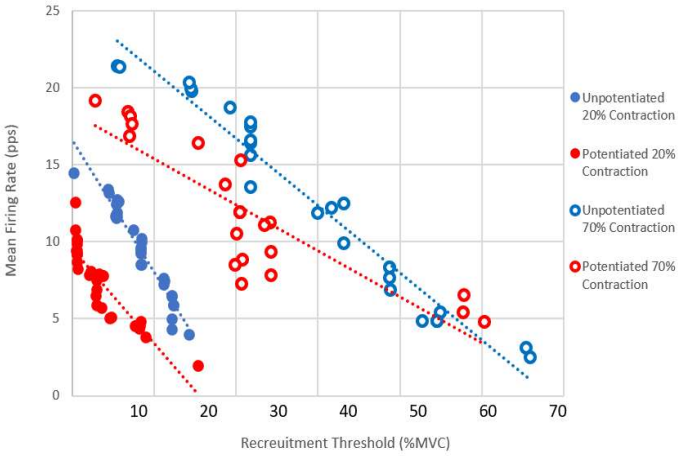
- Children (7-12 years) and adults (18-30 years).

What:

- Isometric maximal voluntary contractions (MVCs).
- Maximal resting isometric twitch torque before and after a 5-second warm-up MVC.
- Low (20% MVC) and high (70% MVC) intensity sustained contractions before and after a 5-second warm-up MVC .

Preliminary Data

Mean MU Firing Rate vs. Recruitment Threshold During Submaximal Contractions in an Adult Male with 84% Twitch Potentiation



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