Relationship Between Regional Pectoralis Major Muscle Size and Peak Power During Incline Bench Press Strength Testing: A Pilot Study

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ABSTRACT

The peak power generated by skeletal muscle during strength training is influenced by several factors, including body weight, maximal force, and muscle fiber orientation, as well as the function affecting excitation patterns. However, there is limited research on the relationship between regional muscle size and peak power output. **PURPOSE**: This pilot study seeks to explore the associations between muscle thickness (MT) and cross-sectional area (CSA) of the pectoralis major and peak power output during an incline bench (IB) press one-repetition maximum (1RM) strength bout. **METHODS**: Seven participants (males = 3; females = 4; age: 24.3±2.7 years; height: 168.2±3.3 cm; weight 68.71±4.86 kg;) had ultrasound measures completed of the pectoralis major at 10% and 25% of the distal to the supra sternal notch. Following this, participants performed 1RM strength tests on an IB press using a Smith machine set to 45 degrees. The barbell was fitted with a linear velocity transducer to measure bar displacement, bar velocity, and power output during the 1RM session. Ultrasound measures of MT and CSA were collected prior to the IB 1RM strength bout. Spearman's rho (r_s) correlations, and 95% confidence intervals, were performed to assess the relationship between MT and CSA measures and peak power output. **RESULTS**: The results indicated a strong, negative relationship between 25% MT of the pectoralis major and peak power output (r_s=-0.71 [-0.957, 0.113]). However, there were weak, negative associations between peak power and CSA at both 10% (r_s=-0.36 [-0.88, 0.56]) and 25% (r_s=-0.21, [-0.84, 0.66]. Lastly, there was a negligible, negative relationship between peak power and 10% MT (r_s=-0.07, [-0.79, 0.73]). **CONCLUSION:** These findings suggest that MT at 25% of the pectoralis major may be an important predictor of peak power output during IB 1RM strength testing. Further research is warranted to confirm whether muscle size can predict peak power during 1RM testing. Developing an algorithm or formula using CSA or MT as a predictor could be the next logical step, which would allow for a better understanding of the relationship between muscle characteristics and aid in developing more targeted training programs to optimize performance and reduce injury risk.