

RATE FORCE DEVELOPMENT DURING BENCH PRESS IS ONLY RELATED TO THROWING VELOCITY WHEN USING LIGHT LOADS

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INTRODUCTION: The bench press is a widely used movement to develop strength and power in the upper-body in team handball players. Although bench press has been extensively used, data about kinematics factors in light free weights is limited (Marques & González-Badillo, 2006). Few studies have examined the relationship between ball throwing performance in elite team handball players with power or rate of force development, and bar velocity during muscle contractions of the upper-extremity in concentric only bench press exercise. The aim of this study was to examine the relationship between ball throwing velocity during a 3-step running throw and strength parameters in each force-time curve against three different light free weights.

METHODS: 13 semi professional team handball players (age 27.7 ± 3.5 yr, mass 83.1 ± 11.3 kg, height 1.82 ± 0.09 m; mean \pm SD) were measured during a concentric only bench press test with 25, 35, and 45kg (40%, 55%, and 70% of the group mean 1RM). A linear transducer (Isocontrol, JLML, Madrid, Spain) attached to the barbell was used to sample displacement-time during the attempts. The ball throwing velocity was determined using a Doppler radar gun (Sports Radar 3300, Sports Electronics Inc.). These tests were performed during the in-season.

RESULTS: The results of this study clearly indicated significant associations between ball velocity and time at maximum rate of force development ($r= 0.66$; $p \leq 0.05$) and rate of force development at peak force ($r= 0.56$; $p \leq 0.05$) only with 25kg load.

DISCUSSION: This research indicated that ball velocity was moderately associated with maximum rate of force development when light loads were used. Indeed, the analysis of the rate force development during these strength tasks was demonstrated, as suggested by others (e.g. Wilson et al., 1995). Nevertheless, few data has been focus on this subject in specific throwing performance.

CONCLUSION: A training regimen designed to improve ball-throwing velocity in elite male team handball players should emphasize bench press movement using light loads. These findings should be interpreted with caution since correlations provide only associations and do not represent causation, so additional research is required to elucidate if improvements in upper body strength as a result of resistance and/or plyometric training will indeed improve maximal throwing velocity in elite team handball athletes.

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