

Isokinetic Strength Profile of Shoulder Internal and External Rotators of Adolescent Volleyball Players Gulcan Harput¹, Hande Guney¹, Fatma Filiz Colakoglu², Gul Baltaci¹

¹Hacettepe University, Faculty Of Health Sciences, Department Of Physiotherapy And Rehabilitation, Ankara, Turkey; ²Gazi University, School Of Physical Education And Sport, Ankara, Turkey

Objectives: The aim of this study was to investigate the effects of limb dominance and gender on isometric, eccentric and concentric strength of the shoulder internal and external rotator muscles in adolescent volleyball players.

Methods: Forty adolescent volleyball players [Male: 23(Age: 15.5±1.4 yrs, Body weight: 72±10.2 kg, Height: 184.4±7.6 cm, BMI: 20.9±2.6 kg/m²), Female: (Age: 16.7±0.9 yrs, Body weight: 60.7±8.2 kg, Height: 172.5±5.3 cm, BMI: 20.4±2.3 kg/m²) participated in this study. Isomed 2000 isokinetic dynamometer was used to measure muscle strength testing. Isometric strength testing of shoulder internal and external rotator muscles were performed at 90 ° shoulder abduction and external rotation position. In the same position, concentric and eccentric muscle testing was performed at 90°/s angular velocity. Strength outcomes were recorded as Nm/kg. 2-way repeated measures of ANOVA was used for statistical analysis.

Results: Dominance by gender interaction was not found significant for internal rotator (IR) and external rotator (ER) muscles' strength (IR: $F(1,72)=2.87$, $p=0.06$, ER: $F(1,72)=1.98$, $p=0.15$). There was a significant strength by dominance interaction for internal rotator muscles ($F(2,72)=18.52$, $p<0.001$). Isometric strength was greater in dominant limb ($p<0.001$) while concentric strength was found greater in non-dominant limb ($p=0.006$). Eccentric strength was found similar for limbs ($p=0.18$). IR muscles showed greater strength during eccentric (1.03 ± 0.05), concentric (0.76 ± 0.03) and isometric test (0.69 ± 0.03), respectively. On the other hand, external rotators showed greater strength during eccentric (0.49 ± 0.4), isometric (0.40 ± 0.3) and concentric test (0.36 ± 0.3), respectively. There was no significant gender effect on the strength (IR: $F(2,72)=0.31$, $p=0.73$, ER: $F(2,72)=0.42$, $p=0.66$).

Conclusion: The strength of shoulder internal and external rotator muscles do not differ according to gender in adolescent volleyball players. Limb dominance has an effect on the strength of internal rotator muscles while it has no effect on the strength of external rotators. Both muscle groups show greater strength during eccentric testing.

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