

Isokinetic dynamometry in sports, rehabilitation and healthy persons

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Background: The shoulder joint is the main joint responsible for upper limb movements. Pathology of the shoulder joint creates an imbalance in its bilateral and unilateral movement, in addition to balance and coordination of other joints and movement of the upper limb. Conflicting facts exist in the literature about whether bilateral comparison of shoulder strength is possible and how the dominant and the non dominant shoulder muscle strength relate to each other.

Objective: To investigate whether flexion/extension and horizontal abduction and horizontal adduction on the shoulder dominant side are significantly different from the non dominant side, and whether a bilateral comparison between muscle strength can be made.

Methods: Concentric flexion/extension and horizontal abduction/horizontal adduction shoulder movements were measured in 23 health male participants using the ISOCOM® dynamometer. Performing five repetitions of each synergetic movement, peak torque values were used for data analysis using the ANOVA variance test along with correlations and linear regression.

Results: There was no statistically significant difference between dominant and non dominant flexion, horizontal abduction and horizontal adduction ($p < 0.05$). Poor to excellent correlations were found between movements. A linear regression made between the dominant and the non dominant shoulder movements resulted in equations which could predict a shoulder's movement strength from its contra lateral one.

Conclusions: The study showed that bilateral comparison is possible and can be of help in shoulder pathology rehabilitation as it helps quantifying strength and weakness of the shoulder movements, and is able to predict recovery level and rehabilitation outcomes of the injured shoulder.