The Determinants of Broad Jump and its Relation to Ice Hockey Skating Performance

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PURPOSE

The standing broad jump (SBJ) is one of the main condition premise for high ice-hockey skating acceleration and speed, which is used during off-ice conditioning premises protocols including the HNL draft. However, the SBJ itself might be influenced by participant anthropometry, body composition, and ability of horizontal force production, which might favor some players.

Therefore, the purpose of this study was to find out which conditioning constraints are consequently related to SBJ and skating performance.

METHODS

Total of 72 ice hockey players (age 17.79 ± 0.59 years; height 179.79 ± 4.94 cm; body mass 77.93 ± 7.42 kg) from the Czech junior league were measured for full anthropometry, countermovement jump, SBJ, 30s Wingate test, on-ice 4m acceleration, 30m sprint, Illinois agility and 6 x 54m during a preseason period. The countermovement jump and broad jump were done on three axis force plate (Kistler, Winterthur, Switzerland), photocells (ALGE-Timing GmbH, Lustenau, Austria) were used to measured on-ice performance and anthropometry was performed by the International Society for the Advancement of Kinanthropometry guidelines. Testing was realized in two days, where one day included all on-ice tests and the second-day off-ice tests. The Pearson correlation coefficient was used to find out relationships between all performances.
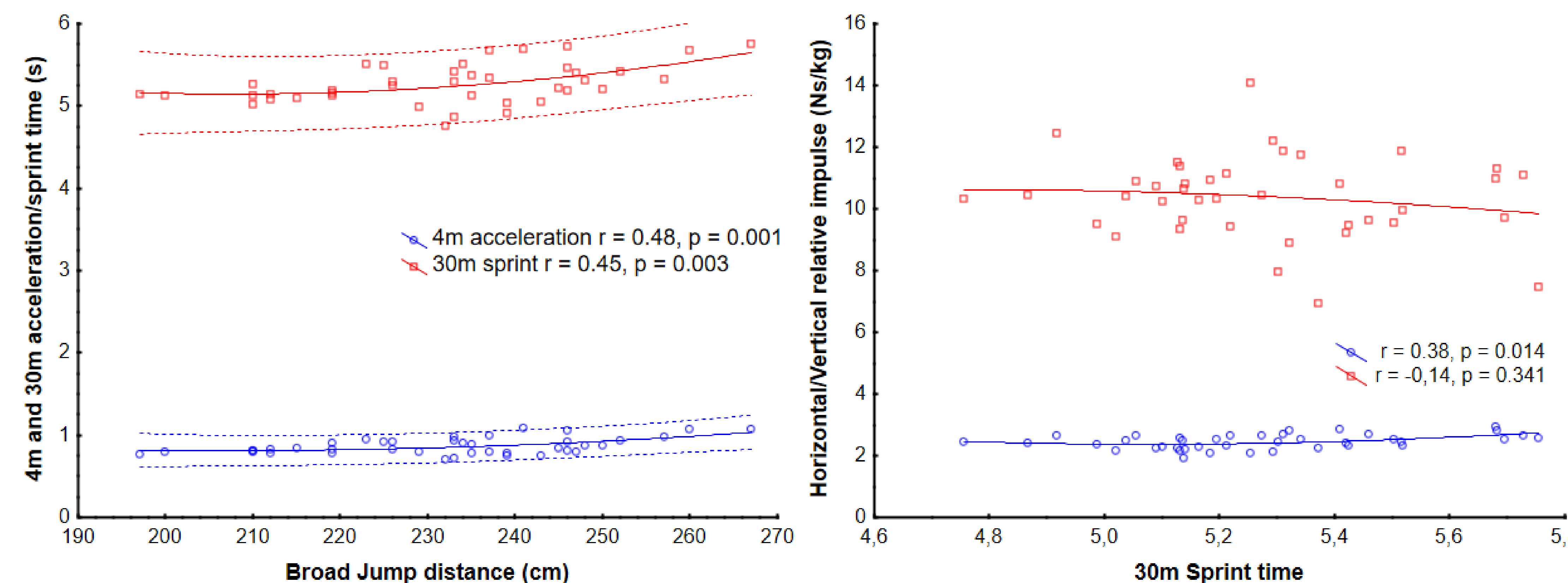
Figure 1. The relationship between standing broad jump and its horizontal and vertical force performance with skating speed and acceleration.

RESULTS

The SBJ performance correlated with 4m acceleration (r = -0.484; p = 0.001) and 30m sprint time (r = -0.452; p = 0.003), where SBJ relative horizontal impulse correlate with 30m sprint (r = 0.386; p = 0.013) and vertical relative impulse not (r = -0.155; p = 0.341) (Figure 1). Another relation of 30m skating was with femoral epicondyle wide (r = -0.384; p = 0.001) and thigh circumference (r = -0.354; p = -0.001) and body fat (r = 0.394; p =-0.001) Other relationships showed marginal or no correlations.

CONCLUSION

The ability to produce quick horizontal force (impulse) is the determinant of long jump and on-ice skating performance, where this ability is supported by thigh mass volume and femoral epicondyle wide. The fat percentage decreases on-ice and broad jump performance and vertical impulse do not have a significant influence on skating performance.

PRACTICAL APPLICATIONS

Training in horizontal strength, power, and volume is crucial for ice hockey speed development as well as broad jump performance which is a very good predictor of ice-hockey skating acceleration and speed. Ice hockey conditioning coaches should use SBJ and other horizontal vector exercises to support skating performance. The thigh volume training is would support skating performance, while players should be aware of increasing body fat.

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