has been well documented that a successful sprint start can be attributed to the ability of an athlete to exert large horizontal forces (Baumann, 1976; Harland & Steele, 1997). This is made evident by the strong relationship between block velocity and horizontal force production. Therefore, the horizontal force production that is related to muscle mass and muscle volume can be a good predictor for the velocity of the sprinters.

82 VELOCITY AND STARTING BLOCK VARIABLES DURING A 30 M SPRINT RUN

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10.1136/bjsm.2010.078725.82

Performance in sprinting is mainly determined by the ability to accelerate, to increase maximal velocity and to maintain velocity during the race. These factors are strongly influenced by structural and metabolic characteristics, anthropometric components but also certainly by biomechanical considerations (Mero et al., 1992). Sixty Flemish adolescent sprint athletes (mean age 14.8 ± 1.7 years) volunteered. Anthropometrical measurements were used to calculate corrected thigh girth, corrected calf girth and total body skeletal muscle mass (Poortmans et al., 2005). The running velocity and time during a 30-m sprint was recorded using a laser device (IBEO Lasertechnik). The horizontal propulsion forces while in contact with the start blocks were registered by two start blocks (Berg, Olympia). The velocity of the sprinters after leaving the blocks continuously increased during the 30-m sprint. Moreover, the results presented a significant influence of age, gender and other anthropometrical parameters on block velocity, block acceleration, force and impulse, where the older boys displayed significantly higher block variable values than girls. In the present study, age, skeletal muscle mass and thigh girth circumference were found to be the best predictors for the velocity during 30 m sprints, block velocity and maximal forces applying on the blocks. In this way, it