NEUROMUSCULAR FACTORS AND YO-YO ENDURANCE TEST PERFORMANCE IN FINNISH YOUNG AND ADULT FOOTBALL PLAYERS

Lehto Henri 1, Vänttinen Tomi 1, Blomqvist Minna 1, Häkkinen Keijo 2
(Research Institute for Olympic Sports 1, University of Jyväskylä 2, Finland)

INTRODUCTION
Yo-yo fitness tests have been commonly used in football to measure endurance performance and also to estimate players’ aerobic capacity (VO2max). To date, some studies have been carried out with adult football players to compare field test results to measured aerobic fitness factors such as VO2max [e.g. 1,2]. The purpose of this study was to examine the relations between estimated and measured VO2max in young and adult Finnish football players and to find out if neuromuscular factors are related to the performance in the Yo-yo Endurance Test in different age groups.

METHODS
The subjects of this study were 11 (11y) (height 1.48 ± 0.07 m, weight 36.9 ± 5.0 kg, body fat 12.0 ± 4.2 %, n=12) and 15 (15 y) (1.71 ± 0.07 m, 59.6 ± 10.6 kg, 8.5 ± 4.1 %, n=9) years old male football players and adult male players (A) (1.77 ± 0.06 m, 75.4 ± 6.7 kg, 12.4 ± 2.5 %, n=14).
VO2max (ml/kg/min) was measured on a treadmill. The Yo-yo Endurance Test Level 1 (20-m shuttle run test) was used to estimate VO2max. Speed tests (10-m and 30-m sprints measured with photocells) and Counter Movement Jump (CMJ) were used as neuromuscular factors. Pearson Correlation was used to evaluate relationships between variables.

RESULTS
Distance covered in the Yo-yo test and the corresponding predicted VO2max, measured VO2max, CMJ, 10 m sprint and 30 m sprint in the different groups were 1886 ± 263 m/48.7 ± 4.1 ml/kg/min, 46.0 ± 4.8 ml/kg/min, 0.29 ± 0.05 m, 2.01 ± 0.10 s, 5.12 ± 0.24 s in 11y; 2376 ± 308 m/55.8 ± 4.3 ml/kg/min, 49.0 ± 3.8 ml/kg/min, 0.38 ± 0.03 m, 1.82 ± 0.10 s, 4.44 ± 0.23 s in 15y and 2451 ± 269 m/56.8 ± 3.8 ml/kg/min, 55.1 ± 4.1 ml/kg/min, 0.43 ± 0.04 m, 1.70 ± 0.06 s and 4.12 ± 0.13 s in A. A significant (p<0.004; 0.01) correlation was found in the 15 y between the distance covered in the Yo-yo test (predicted VO2max) and 10-m (r = -0.847) and 30-m (r = -0.822) sprint times.

DISCUSSION
The results of this study revealed, in contrast to previous findings [2], that the estimated VO2max- values were higher than the measured VO2max in all groups. Furthermore, in the present subjects VO2max could not be reliably estimated based on the Yo-yo test results. The established correlation between the sprint times and Yo-yo test results in 15y imply that in addition to aerobic capacity neuromuscular factors seem to affect their performance in the Yo-yo test. Especially this seems to be the case in this type of heterogeneous group, in which maturation varied greatly. In addition, the absence of the relationship between predicted and measured VO2max in all age groups suggests that the Yo-yo Endurance Test could be more suitable to measure endurance performance rather than aerobic capacity in football players.

REFERENCES

Keywords: Football, Field Testing, Neuromuscular Physiology