

PHYSICAL FITNESS TRAINABILITY IN YOUNG SOCCER PLAYERS

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Introduction

Children and adolescents are often suggested to be more responsive to physical training during periods of rapid growth, the so-called "golden periods". However, whether changes in physical fitness are related to the actual training or to the normal growth remains unclear¹. The aim of this study was to investigate the effects of an entire season of soccer training and match play on physical fitness responses in two groups of highly-trained young soccer players differing in growth rate, biological maturity and age.

Methods

Twelve pre-age at peak height velocity (pre-APHV) players (age 12.9 ± 0.5 y; -1.34 ± 0.60 y to PHV, height 1.51 ± 0.07 m; body mass 40.2 ± 7.2 kg) and 11 post-APHV players (age 15.7 ± 0.6 y; 0.92 ± 0.73 y from PHV, height 1.67 ± 0.07 m; body mass 52.0 ± 6.4 kg) trained on average of ~ 14 h of combined soccer training and competitive match play per week during an entire season (8 months). Physical fitness tests, conducted at the beginning and end of the season, included: counter movement jump (CMJ), acceleration (ACC) and maximal sprinting speed (MSS) obtained during a 40-m sprint with 10-m splits, repeated-sprints ability (10 x 30-m sprints, RSA) and an incremental running test to estimate maximal aerobic speed (MAS).

Results & Discussion

The pre-APHV group displayed an almost three-fold greater increase in growth (i.e., height) than the post-APHV group. Substantial improvements in all physical performance variables were observed throughout the season in both groups. After adjustment for changes in height, between-group differences in training responses (Figure 1) favored the post-APHV group for CMJ, ACC, MSS and RSA. On the contrary, MAS was most responsive to training in the pre-APHV group.

Conclusions

The differential adaptive responses in neuromuscular (i.e., CMJ, ACC, MSS, RSA) and cardiovascular (i.e., MAS) fitness in response to soccer-specific training in our sample of young soccer players are likely to be mediated by age and/or biological maturation and growth-related factors, respectively.

References

1. Malina, R.M. et al. (2004). *Human Kinetics*.

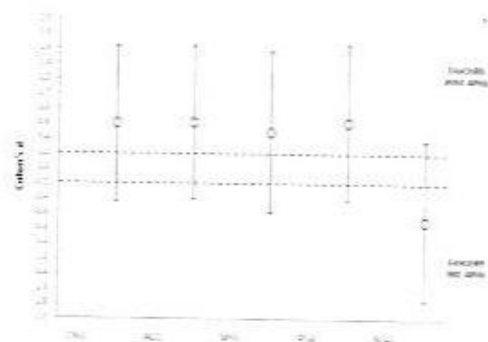


Fig. 1. Between-group differences (expressed as Cohen's d or effect size) in training responses including changes in growth (i.e., height) as a covariate.