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Società Italiana
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Università degli Studi di Napoli Federico II

Università degli Studi della Campania Luigi Vanvitelli

73° CONGRESSO NAZIONALE

con il Patrocinio

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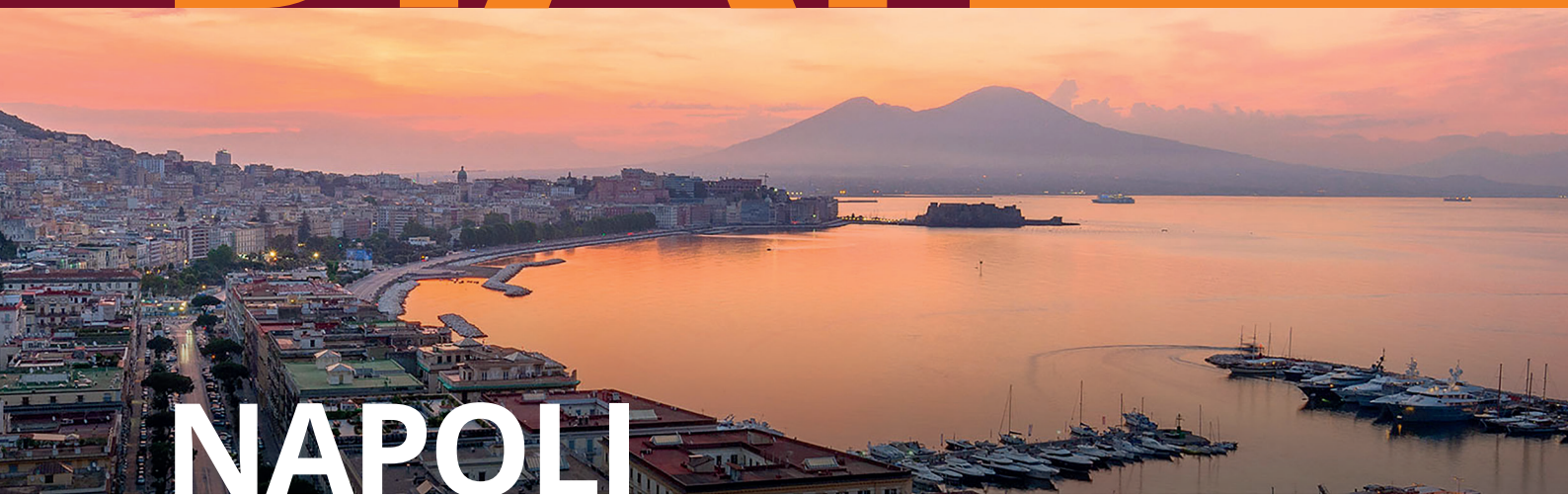

NAPOLI

22 - 24 SETTEMBRE 2019

Centro Congressi Federico II

Via Partenope, 36

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Influence of biological maturation on postural control in young soccer players

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Biological maturation does not follow a linear development path; the process presents inter-individual differences concerning the timing of psychophysical development. The nonlinear nature of the biological maturation process often results in sudden and rapid modifications that can influence the sensorimotor functions, in particular when the peak height velocity (PHV) is approaching. Static standing balance and postural control are fundamental skills, both for daily living and sport performance, that can be strongly affected by PHV. We examined the influence of biological maturation on the performance of static standing balance, an index for sensorimotor control. Two-hundred and 38 young healthy soccer players (U9 to U17), playing in a sub-élite club (at least two training sessions and an official match per week), were evaluated. After anthropometric measurement, standing balance was assessed using a baropodometric platform (BTS P-Walk, Italy). Subjects stood barefooted on the platform and were recorded at 20 Hz during two 30-s tests, the first with eyes open and the second keeping eyes closed. Participants were split into six groups based on the Maturity Offset (MO), representing the estimated time to/from the PHV and calculated according to Mirwald et al[1]. The body center of pressure (CoP) sway area and velocity were calculated. Differences between MO groups were tested using a 2-factor (MO and condition) ANOVA with repeated measures on the condition factor (eyes open/closed). The sway area showed a decreasing trend as the MO increased, in particular in MO<-1.5 was higher than in MO>0.5 ($p<0.001$). Likewise, CoP velocity presented a similar pattern ($p<0.001$), with a marked decline in groups with MO>0.5. The results suggest that biological maturation is associated with changes in standing balance control. The reduction of CoP sway area and velocity as the MO increase represents the improved efficiency of the postural control system.

1. *Med Sci Sports Exerc*. 2002;34(4):689-694.