Morphological characteristics and body composition of tennis male and female players during growth

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Introduction
Tennis is one of the world's most popular and professional sport and requires physical, technical, tactical and physiological qualifications in order to obtain a high level of athletic performance. When players of equal ability meet in competition, the one with the most favorable physical characteristics may gain the advantage. In such circumstances a fundamental structural measure such as a stature may be important for victory (Reilly, 1997). For example, height provides an advantage in serving, in reaching the ball and in cutting off an opponent’s drive at the net. Studies support that a majority of top male tennis players are taller than average, but the trend is more apparent in females (Seliger et al., 1973; Reilly, 1997). In this respect, morphological characteristics are important elements because are one of the most major factors which influence the quality of the performance. Knowledge of these factors may lead to a better talent identification. In addition, excess body weight as fat is disadvantageous in moving quickly across court and in leaping to strike the shuttle (Fox, 1984; Reilly, 1997). The purpose of this study was to evaluate the morphological characteristics and body composition of male and female tennis players aged 10 to 12 years old.

Methods
A total of forty-one (n=41) tennis players (male n=21 & female n=20) and a control group (n=50, male n=25 & female n=25), aged 11.18±0.42 yrs, were participated in the study. Height, body mass, sitting height, armspan, skin-fold thickness (triceps and calf), 13 circumferences (shoulder, chest, waist, abdominal, buttocks, thigh proximal-mid-thigh-distal, calf, ankle, arm, forearm, wrist) and 8 diameters (biacromial, chest, biiliac, bitrochanteric, knee, ankle, elbow, wrist) were measured (Lohman et al., 1988). The sitting and standing height ratio was obtained according to the formula: Sitting height (cm) X 100 / Height (cm). Derived measures included percent body fat, were obtained using the Slaughter et al. (1988) equation. The multiple analysis of variance (MANOVA) was used in order to determine if significant variance existed among groups and paired t-tests between the right and left legs in each team separately.

Results
The analysis of data indicated that tennis players have higher values in the most of morphological characteristics (p<0.001) than non-athletes (Figure 1). Significant differences were found in height (p<0.001), body mass (p<0.01), biliac breadth (p<0.001) and the overall circumferences (p<0.05). Although, tennis players presented higher values in morphological characteristics and in the majority of the upper limb circumferences (p<0.001), the values of body fat were lower (p<0.01). Also, both boys and girls tennis players tend to have most broad shoulders in comparison to non-athletes. It is worth mentioning, however, that there were differences in the circumferences between the right and left arm (Figure 1d), farm and wrist circumferences (p<0.001) on both male and female tennis players.

Discussion/Conclusion
In the present study, the results showed that there were significant differences in the most morphological characteristics between the athletes and non-athletes. These findings indicate that tennis required specific kinaanthropometric attributes among the male and female athletes of which may be considered as talent criteria in each team separately. In addition, the significant statistical differences which were found in the circumferences of the upper limbs show that regular physical activity and training leads to specific adaptations of the muscle mass. Indeed, it is recognized that the arm muscles are loaded by the weight of the racquet, which is greater in tennis than in the other racquet sports (Reilly, 1997).

References