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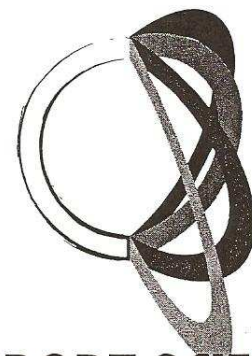
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ANALYSIS OF ANTHROPOMETRIC CHARACTERISTICS AND JUMPING ABILITY IN JUNIOR TOP LEVEL VOLLEYBALL ATHLETES. COMPARISON BY ROLE.

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Introduction

The volleyball is a situational sport classified among activities laying on alternative aerobic and anaerobic processes, with an important participation of the muscular mass and an accentuated prevalence of the alactacid anaerobic process. Within a population of young top volleyball athletes, the goal of the study was to compare several anthropometrical and functional variables according to the role of the player during the game.

Methods

Data were collected by 42 volleyball players which trained with the Italian national junior team, divided into four groups: (1) side spikers (n = 14; age = 18.5 + 1.4 y.), (2) centre spikers (n = 15; age 18.1 + 1.1 y.); (3) setters (n = 7; age = 18.4 + 1.3 y.), and; (4) universal spikers (n = 6; age = 17.5 + .8 y.). Morphological data were height, weight, body mass index (BMI), indirect ratio of body fat determined by the formula of Katch (%BF), reach with one (R1) or two (R2) hands. The explosive force was measured with the method of Bosco [1] : squat jump (SJ), counter movement jump (CMJ), CMJ with arms (CMJa) and repeated jumps during 15 seconds (RJ15). The ability to jump was measured with the Vertec test in two conditions: spike (Vertec attack, VA) and block (Vertec block, VB). Jumping performance was determined through the difference between VA and R1 (running spring, RS) and VB and R2 (standing spring, SS).

Results

Significant differences were pointed out for the height (F = 4.75; p<.006), R1 (F = 3.6; p<.02) and R2 (F = 3.66; p<.02). For the three anthropological variables, centre spikers (C) were significantly higher than setters (S). Comparing players' performance at the Bosco tests, no significant differences appeared between groups. Results of Vertec tests showed significant differences in VA (F = 7.29; p<.001) where group C performed better than groups S and U (universal spikers), and in VB (F = 3.95; p<.05) where group C achieved significantly better then setters. Analysis of the correlation matrix showed that height and weight were strongly correlated between them and with R1 and R2. Performances at Bosco tests and at Vertec tests were respectively correlated between them but no correlation was observed between results of Bosco and Vertec tests. With Bosco tests gathered information provide an assessment of the jumping ability without connection to the specific skills while Vertec tests provide more specific information about the athlete's ability to use spring in specific conditions. A high correlation was identified between anthropometric variables and the results of the Vertec tests. Multiple regression analysis confirmed that, excepted %BF which is only (inversely) correlated to Vertec performances, all groups of variables were correlated between them.

Discussion/Conclusion

Results pointed out that in junior top level volleyball, the anthropometrical profile of the players is directly related to specific variables which must be used to select talented athletes and to plan training in connection with specific role of the player in the game. Because of the reduced duration of the game episodes and to the increasing intensity of the game rhythm, the modern volleyball involve increasingly the alactacid anaerobic component. It is for all above reasons that top level volleyball needs always more muscular powerful athletes who are also fast and able to use high jumping abilities. For that reason, assessment, training and follow up of the jumping abilities become some of the most determinant aspects of the player's effectiveness. Data underline the interest of the use of specific tests to identify the jumping ability of volleyball athletes. The protocols developed in that study can provide determinant information during the first phase of athletes' selection.

References

[1]. Bosco C et al. (1983). *Eur J Appl Physiol*, 50(2), 273-282.