

Physiological characteristics of elite male and female beach volleyball players

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Introduction

Beach volleyball has rapidly become a recognized professional sport world wide. It was introduced as an Olympic sport for men and women at the 1996 Atlanta Olympics and there are now approximately 150 national federations with developmental beach volleyball programs representing over 2000 professional players. At present there are no data highlighting the physiological profiles of beach volleyball players. The aim of the present study was to develop a physical and physiological profile of elite and male and female beach volleyball players.

Methods

Seventeen males and 21 females participating at the World Tour competition in Gstaad, Switzerland (June, 2003) performed a series of physical and physiological tests. At the time of testing 14 of the subjects were ranked in the top 32 in the world. The nationalities represented were from North America, South America, Europe, Asia and Australia. The tests included standing height, arm span, body weight, body composition and vertical jump height and power when performing a counter movement and a squat jump. The jumps were measured using a force platform as well as in the sand using a Myotest® accelerometer (Acceltec, Sierre, Switzerland).

Results

Table 1 presents the physical characteristics of the subjects. Tables 2 and 3 present physiological measurements made using a force platform and in the sand, respectively. A negative correlation was observed between the maximal power produced during a block jump in the sand and the world ranking, for the men, but not women (Figure 1). Figure 2 shows a strong positive correlation between the force measured using both the force platform and the accelerometer in the sand.

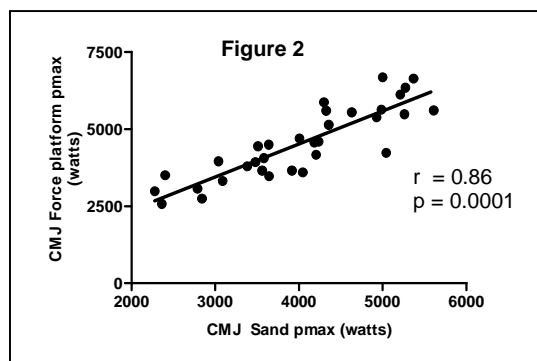
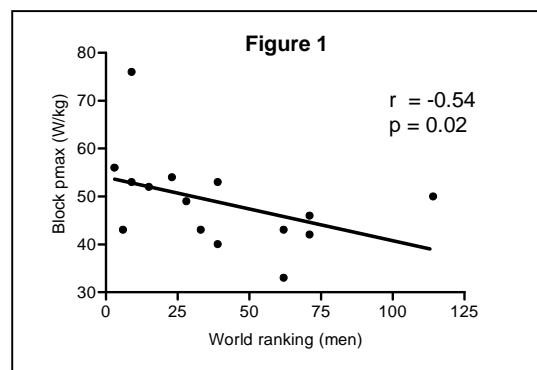
Parameter	Men	Women
Age (years)	29 ± 4	27 ± 5
Height (cm)	191 ± 4	178 ± 6
Mass (kg)	85.5 ± 6.3	68.2 ± 5.6
% Fat	13.9 ± 1.9	NA
Arm Span (cm)	96 ± 4	179 ± 8
Stretching height (cm)	247 ± 6	226 ± 10

Parameter	Men	Women
SQJ height (cm)	54 ± 4	42 ± 5
SQJ pmax (W/kg)	59 ± 5	48 ± 7
CMJ height (cm)	59 ± 5	45 ± 5
CMJ pmax (W/kg)	59 ± 5	49 ± 6
CMJ Block height (cm)	68 ± 6	53 ± 7
CMJ Block pmax (cm)	68 ± 9	53 ± 8

SQJ, squat jump; CMJ; counter movement jump;
Vmax, maximum velocity; pmax, maximum power

Parameter	Men	Women
Block height (cm)	301 ± 10	263 ± 9
Block pmax (W/kg)	58 ± 10	48 ± 8
Spike height (cm)	313 ± 10	272 ± 9
Spike pmax (W/kg)	77 ± 7.6	61 ± 9

*measured using the Myotest® accelerometer



Conclusion

Here we present a physiological profile for elite male and female volleyball players. We observed that the maximal power produced during a block jump in the sand may be a good predictor of performance. These results should help coaches and players to improve the specificity of their training programs, with the eventual outcome being an increase in the performance levels of national and international beach volleyball. Additionally, the use of the Myotest® accelerometer provides coaches and players with a portable piece of equipment that can accurately measure the production of power.