

OBJECTIVES

Sitting volleyball is a sport developed for athletes with lower extremity impairment (e.g. amputations, disabling joint injuries or conditions, limb weakness). It varies from volleyball in three ways: the court is smaller (10 x 6 m), net is lower (1.15 m for men and 1.05 m for women) and participants must remain "seated". Sitting volleyball has been a Paralympic sport since 1980 but still no studies have been reported in which the actual actions of the game have been described. Furthermore, it has been suggested that objective analysis of the game actions should serve as the basis for future planning in any coaching process [1]. Therefore the aim of this study was to give an objective and more detailed description of the game for the future development of the sport.



Figure 1. Sitting volleyball game situation.

METHODS

A total of eight sitting volleyball matches (men 4, 12 sets, and women 4, 13 sets) from the European Championships 2003 semi finals and finals were videotaped and analyzed with Data Volley -software. In every serve, reception, spike and block player's position and result of the action were coded. Following categories were used for coding:

Serve: error, negative, positive, winner

Spike: error, continuing, winner

Reception: error, negative, positive

Block: winner.

The means and SDs for each team per set were calculated for the number of serves, receptions, attacks, kill blocks and opponent errors as well as for the success and error percentages in serving, receiving and attacking. The results between men and women and also between winning and losing teams per set were compared using t-test for independent samples.

RESULTS

One team performed in one set on average 22.0 serves in men's matches and 20.3 serves in women's matches (n.s.). The number of receptions was 19.1 and 17.2 (n.s.), attacks 32.4 and 23.0 ($p < 0.001$), kill blocks 3.5 and 2.3 ($p < 0.05$) and opponent errors 5.4 and 5.8 (n.s.), respectively (figure 2).

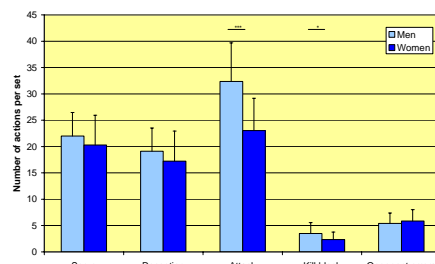


Figure 2. The total number of actions per set in men's and women's matches.

The success percentages in serving were 32.0 % for men and 46.0 % for women ($p < 0.001$), in reception 67.7 % and 49.5 % ($p < 0.001$) and in attack 35.4 % and 35.9 % (n.s.), respectively. The error percentages in serving were 9.2 % for men and 12.9 % for women ($p < 0.01$), in reception 11.3 % and 25.1 % ($p < 0.001$) and in attack 19.0 % and 19.5 % (n.s.), respectively (figure 3).

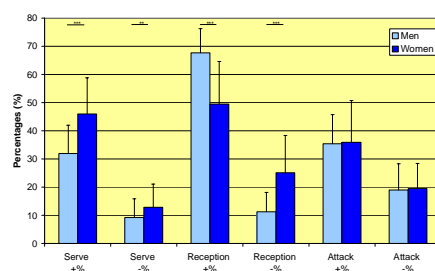


Figure 3. The success and error percentages in serving, receiving and attacking in men's and women's matches.

In men's matches the teams that won a set had higher success percentages in serving (36.2 % vs. 27.8 %, $p < 0.05$). In attacking the winning teams had higher success percentages (40.4 % vs. 30.4 %, $p < 0.05$) and lower error percentage (12.2 % vs. 24.8 %, $p < 0.01$). Also the winning teams made more successful block actions per set (4.8 vs. 2.2; $p < 0.001$) (figure 4).

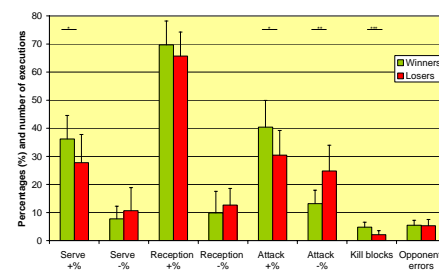


Figure 4. The differences between the set winners and losers in men's matches.

In women's matches the teams that won a set had higher success percentages (45.9 % vs. 25.9 %, $p < 0.001$) and lower error percentage (15.2 % vs. 23.9 %, $p < 0.05$) in attacking. Also the winning teams made more successful block actions per set (3.0 vs. 1.7; $p < 0.05$) (figure 5).

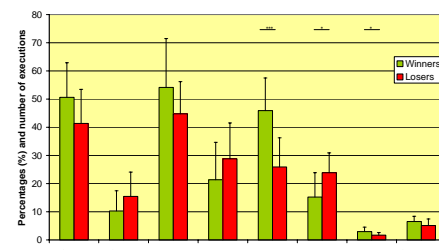


Figure 5. The differences between the set winners and losers in women's matches.

CONCLUSION

Based on the results of this objective match analysis it can be concluded that attacking and blocking were the most important skills concerning winning in sitting volleyball. Findings are in accordance with previous results reported in volleyball [2, 3].

On the contrary, the quality of attacking in both men and women was found to be lower in sitting volleyball when compared to volleyball. Furthermore the quality of reception in women was dramatically lower when compared to volleyball. [2, 3]

REFERENCES

- [1] Hughes, M. and Franks, I. (2004) *Notational Analysis of Sport*. London, Taylor & Francis Group.
- [2] Häyrinen, M., Hoivala, T. & Blomqvist M. (2004). Differences between winning and losing teams in men's European top-level volleyball. In: *Performance Analysis of Sport VI*, eds. P. O'Donoghue & M. Hughes. pp. 194-199. Cardiff: UWIC.
- [3] Palao, J.M., Santos, J.A., & Ureña A. y. (2004). Effect of team level on skill performance in volleyball. *Int J of Performance Analysis in Sport* 4 (2): 50-60.