

INTRODUCTION

The importance of the serve is high in men's international top volleyball. Strong serve is a powerful offensive weapon in scoring points directly and in assisting the block and defense to score points [1, 2]. The players use mainly three different kinds of serve techniques: traditional float serve, jump serve and jump float serve. There is only a little research focusing on the speed of the serve.

The purpose of this study was to describe the proportions of different serve techniques and serve speeds in men's volleyball at three different levels: boy's youth national teams, Finnish men's league teams and men's national teams.

METHODS

The serve speeds were measured in nineteen matches:

- ▶ Boy's youth national teams, G1
 - 8 matches, 571 serves
 - n=47, age 17.3±0.6 years, height 194.2±6.0 cm.
- ▶ Men's Finnish League teams, G2
 - 5 matches, 502 serves
 - n=59, 25.8±5.4 years, 193.4±5.6 cm.
- ▶ Men's national teams, G3
 - 6 matches, 993 serves
 - n=38, 26.7±3.9 years, 196.7±5.2 cm.



Figure 1. Top volleyball player performing a jump serve (Photo FIVB).

The serve technique distribution was calculated for each group for six different serve types (jump serve, short jump serve, jump float, short jump float, float and short float).

The serve speeds were measured using Stalker Professional Sports Radar. The radar was positioned at the end of the court as far as possible from the court at 1.6 meter height. For the boy's youth national team and Finnish League matches only the serves served towards the radar and for the men's national team matches all serves were used for the analysis. The angle errors were corrected by using cosine-calculations. The means and SDs for serve speeds for three different serve types (jump serve, jump float and float) were calculated and the results between the groups were compared using t-test for independent samples.

RESULTS

As can be seen from figure 2 in the men's teams the jump serve was the most often used serve type (56–66%), whereas in the youth teams the jump float was the main serve technique (54%). Altogether jump and jump float serves were the most commonly used serve techniques in all groups G1: 93%, G2: 84% and G3: 87% and other serve types were used only rarely (12 %).

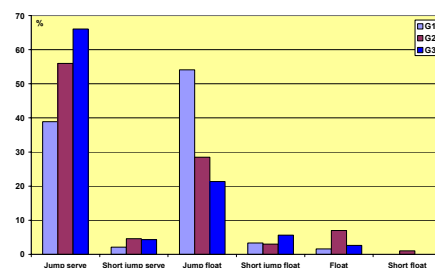


Figure 2. The proportions of different serve techniques.

Significant differences in speeds of jump and float serves ($p < 0.001$) were found between all groups (G1 vs. G2, G1 vs. G3 and G2 vs. G3) (figure 3).

The speed of the jump serve increased according to the level of the team from

78 to 95 km/h. Similar effect was also found in the speed of the float serve which increased from 49 to 59 km/h. In contrast the speeds of the jump float serve were quite similar (56 km/h) in all groups (figure 3). The speeds of the fastest successful serves were as follows: jump serve 125 km/h, jump float serve 73 km/h and float serve 63 km/h.

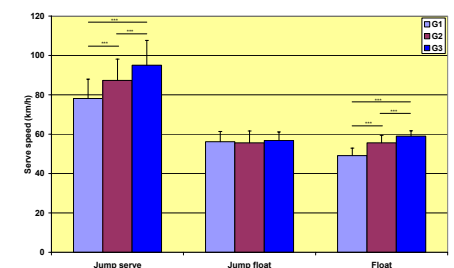


Figure 3. The means and SDs of the serve speeds in different groups and serve techniques (***) = $p < 0.001$.

CONCLUSIONS

- In volleyball the serve techniques and speeds differ according to the performance level.
- At the highest levels jump serve and at the youth level jump float serve were the dominating serve techniques.
- The effective use of jump serve places high demands on the physical abilities and therefore it seems that it is easier for the younger players to use jump float serve.
- The highest serve speeds were found in the jump serves at the highest performance level.
- Lower serve speeds allow receivers to make perfect receptions enabling team to score points by reception-attack.
- At the highest level the importance of the jump serve speed is even more emphasized due to highly skilled receivers.

REFERENCES

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E-mail: mikko.hayrinen@kihu.fi