

SHORT REPORT

Injury Incidence in Female Serbian Elite Volleyball Players

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Abstract

Sport injuries are unavoidable factors that influence the life of every elite athlete. They are most likely caused by increased frequency, intensity, and duration of training. Even the slightest injury could, from a functional point of view, influence athletic results. This research aims to analyse and provide data regarding injury typology of elite volleyball players of Serbia. Data were collected from 15 female volleyball players of the Serbian national volleyball team. The average age of the players was 25.53 years, with 14 years of volleyball experience. The results show that the most frequent injuries were injuries of the ankle (33%), followed by shoulder injuries (20%), and other injuries, and that the jumping phase had the highest occurrence of injury.

Key words: elite sport, female, injury

Introduction

Volleyball is characterized by fast and explosive movements, high jumps and ball play, as well as the need for short reaction time. Technology and knowledge have advanced in the previous two decades, and sport science has followed this development. Novel training modalities have been introduced; new diagnostics procedures, rehabilitation techniques, and supplements have emerged. With this, the intensity by which athletes exercise has become higher, recovery times shorter, and achievements greater. In volleyball, the rules have also changed, and the game itself has gone through significant changes. All this has led to more precise training planning in aspects of volume, intensity, type, recovery, to achieve the highest results possible. The game requires high levels of strength, technique, and adequate tissue adaptation for every aspect of it. If the players lack the needed skill in just a single aspect, be it technical or inadequate preparation, the results are more likely to be worsened.

The most frequent injuries in volleyball occur in the shoulders, knees, ankles, and fingers (Aagard, & Jorgensen, 1996). The most common acute ones are in the fingers and ankles, while chronic injuries are characteristic for the shoulders and knees (Aagard, & Jorgensen, 1996; Bere, Kruczynski,

Veintimilla, Hamu, & Bahr, 2015). Concerning injury risks, researchers conclude that senior players have a higher risk, and also have more reported injuries (Bere et al., 2015). With that in mind, the results of several studies (S.R. Augustsson, J. Augustsson, Thomee, & Svantesson, 2006; Pimeta, Hespanhol, Grangeiro, & Lopes, 2017) show that the prevalence of overuse injuries in volleyball is high, although lower than in other sports, such as soccer and handball (Augustsson et al., 2006; Bere et al., 2015; Junge et al., 2006; Soligard et al., 2018).

This research is focused on current trends in injury epidemiology of elite Serbian female players.

Methods

The data were gathered using a questionnaire given to female volleyball players on the Serbian national team for 2016. Fifteen players voluntarily filled out the questionnaire. The survey had 20 questions in three parts: a socio-demographic and descriptive part, a part related to training and preventive programmes, and a part related to and injuries. Variables taken into consideration were preventive methods and activities not related to training. Data were analysed with descriptive statistics using percentages and sums.



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Results

Risk factors that may influence injury incidence and should be taken into consideration are the number of hours spent in practice (Table 1) and the specific need for physical skills that

volleyball requires players to provide. This information could indicate the type of stress the body has to adapt to during practice and can also show in which ways training modalities have an impact on tissue adaptations, during strictly professional exercise.

Table 1. Descriptive Statistics of Volleyball Players (N=15)

	Mean±SD	Min	Max	Range
Age	25.53±2.72	20	30	10
Height (cm)	187.73±6.31	170	194	24
Weight (kg)	75.07±7.09	59	85	26
Volleyball Experience (years)	14.73±3.35	8	20	12
Training sessions per week	10±0	10	10	0
Hours in training per week	20±0	20	20	0
BMI	21.22±1.16	19.8	23.3	3.5

In Table 2, preventive measures that athletes are introduced to are shown; the relative drop in Strength Training is assumed to be the result of an increase in Technical Drills. Also,

none of the subjects were involved in sports activities other than volleyball, and all reported that they were monitored by the coach.

Table 2. Descriptive Statistics of Volleyball Players (N=15)

	Strength	Plyometric	Technical Drills.
Preseason	100%	40%	46.67%
Season	86.68%	40%	66.68%

Figure 1 and 2 show the data about situational incidence and positional assessment regarding injury percentages. It is seen (Figure 1) that the moment that poses the highest

risk of injury occurrence in volleyball is the jumping phase; this is supported by other authors (Bere et al., 2015; Schafle, Requa, Patton, & Garrick, 1990).

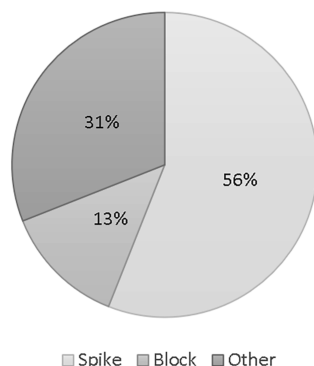


Figure 1. Situational Epidemiology

This is further strengthened by our results (Figure 2) that the positions of the setter and left/right front row have 53% of injuries altogether, while 40% is on the backline and 7% in the libero, which shows that the front row has more

injuries than the back does. Several studies (Bere et al., 2015; Miranda, Mas, Lopez, Perez, & Micheo, 2015; Schafle et al., 1990) concluded that the position closer to the net has more injuries.

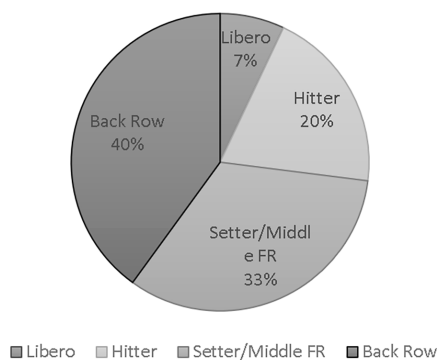


Figure 2. Positions

Concerning the locations of injuries, our results show that the ankles are most frequently injured but, with 20% of

injuries, the shoulder is mostly reported regarding overuse (Figure 3).

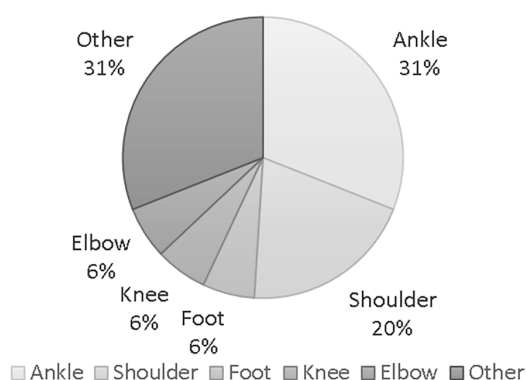


Figure 3. Epidemiology

This is also supported by previous results that show the shoulders and knees as locations at risk of overuse injury (Aido, Massada, Leita, Magalhaes, & Puga, 2011; Augustsson et al., 2006; Aagard & Jorgensen, 1996; Bere et al., 2015). It is also reported that the female population has more chronic overuse shoulder problems (Aagard & Jorgensen, 1996). Also, players reported that they could not finish the match 80% of the time,

and 40% of the time it resulted in absences of two to four weeks.

Interest should be focused on overuse injuries and injuries of the shoulders since they can be affected by changes in training methodology, monitoring, and planning. It should be noted (Figure 4) that almost half of the injuries occurred in contact with another player. Nestic, Ilic, Sikimic, and Dopsaj (2011) also provided similar data.

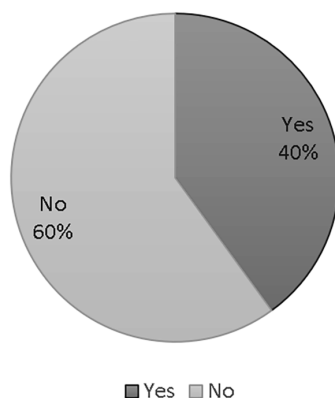


Figure 4. Contact

Discussion

Evidence suggests that little has changed regarding injury typology in the last two decades, and Serbian elite players do not differ from other athletes. From the data collected, it can be assumed that cumulative training and game hours in addition to volleyball sport specific requirements could pose an increased risk from overuse injuries. Even though ankle injuries were the most commonly reported ones, shoulder injuries were the most chronic, while the jumping phase and spiking had the highest risk.

This calls for further discussion of how preventive programs and methodologies can be improved to reduce the risk of occurrence. Taking all evidence into consideration, it should be proposed that future advanced training techniques and research should be aimed to improve monitoring in the developmental phase of players and younger categories. Many individual characteristics may express their effects in later stages, especially as overuse injuries. To improve the resting and recovery techniques and mechanisms should also be suggested for further research goals.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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