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A one season prospective cohort study of volleyball injuries

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ABSTRACT

To estimate the overall incidence of acute and overuse volleyball injuries and to describe factors associated with ankle sprains. Methods: 486 players from the Rayalaseema University players participated in the study and were followed prospectively during a whole season. Three measurements were made during the season (baseline, follow up 1, and follow up 2), where all players completed a questionnaire on demographic variables (only at baseline), sports participation, use of preventive measures, and previous injuries. Volleyball exposure during training and matches was recorded for each individual player by the coach on a weekly exposure form. In case of injury the coach provided the injured player with an injury registration form, which had to be completed within one week after the onset of injury. Results: 100 injuries were reported, resulting in an overall injury incidence of 2.6 injuries/1000 hours. The incidence of acute injuries was 2.0/1000 hours. Ankle sprains (n = 41) accounted for most of the acute injuries, and 31 (75%) of all players with an ankle sprain reported a previous ankle sprain. Twenty-five overuse injuries were reported. The overall incidence of overuse injuries was 0.6/1000 hours; the back and the shoulder were the most common sites. Conclusions: Ankle sprain is the most common injury in volleyball, accounting for 41% of all volleyball related injuries. Previous injury seems to be an important risk factor for an ankle sprain. Injury prevention programmes should focus on ankle sprains and concentrate on players with previous ankle sprains.

KEYWORDS: voleyball, ankle sprains, measurements.

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INTRODUCTION

Volleyball is one of the most popular sports in the world. It is played by approximately 200 million players worldwide[1]. Despite the popularity and the large number of players there have been surprisingly few prospective reports on volleyball injuries and their prevention[2.] As volleyball is a non-contact game, where players from the opposing teams are separated by a net, the incidence of injuries might be expected to be low. Nevertheless, volleyball is a sport involving rapid and forceful movements of the body as a whole, both horizontally and vertically, and because of the large forces involved in such movements it is inevitable that injuries occur.[3] De Loe¨s, [4] for instance, found in a three year prospective study that—with an injury incidence of 3.0 per 1000 hours—volleyball is the eighth most injury prone sport in the age group 14 to 20 years. Schafle et al found an overall injury incidence of 2.3 per 1000 hours during the United States.

Our aim in the present study was to examine the overall incidence of volleyball injuries, both acute and chronic, and to describe the factors associated with ankle sprains. For this purpose, a season long prospective cohort study in a population of competitive volleyball players was used.

METHODS

Population

Sixty eight teams (50% of all Rayalaseema University Region teams) were invited to participate in our prospective cohort study. From these, 50 teams (35 male,15 female) consisting of 600 players agreed to participate. The coaches of all participating teams were informed face to face of the purpose and procedures of the study.

Design and measurements

At the start of the season (September 2016) all players completed a questionnaire on demographic variables, sports participation (volleyball and other sports), the use of preventive measures, and previous injuries. This questionnaire (except for the demographic variables) was repeated in January 2017 (follow up 1), and again at the end of the season (May 2017, follow up 2). In order to be included, players had to be free from injury at the start of the study.

Exposure was recorded by the coach on an exposure form. Coaches noted the total duration of each training session and match, and classified the level of participation of each player (that is, in terms of full, three quarters, one half, one quarter, or no participation). If the player did not participate fully, the coach noted the reason—that is, being injured, ill, or absent for other reasons. Completed exposure forms were returned on a weekly basis. Owing to the amount of data coaches had to report during each training and match session, it was inevitable that there would be

incomplete exposure forms. Incomplete forms were immediately followed up by a phone reminder. Finally, for all but six teams all exposure forms were collected completely.

In case of injury the coach provided the injured player with an injury registration form, which had to be completed within one week after the onset. On this form the player was asked to provide information on the injury location, injury type, diagnosis of the injury, direct cause of the injury, preventive measures used at the time of the injury, first aid given, and subsequent medical treatment. If an injury was noted on the exposure form and no injury registration form had been received within two weeks after the injury was logged, the coach was contacted and urged to let the player complete the injury registration form.

Injury definition

An injury was recorded if it occurred as a result of volleyball and caused the subject to stop this activity, or resulted in the subject not participating fully in the next planned sports activity. All recorded injuries were independently diagnosed as being either acute (that is, resulting from a sudden event during organised volleyball) or overuse (resulting from volleyball, but without a sudden event leading to injury) by two certified sports physicians, using the injury registration forms. In a consensus meeting, the two physicians tried to reach agreement on injuries which they had classified differently. If no accord was reached a third sports physician would make the final decision. This latter situation, however, did not occur.

ANALYSIS

For each of the 168 non-participating teams the number of players, their sex, age, and volleyball experience, and the number of registered players in the club were tracked through the administration of the Kurnool District Volleyball Association for a non-response analysis.

Injury incidence was calculated for all participants and for men and women separately, as the number of new injuries reported per 1000 hours of play (total, match, or training, as appropriate), using exposure time of each individual player until the onset of first injury. For each injury category—that is, chronic or overuse—injury incidence was calculated using exposure time of each individual player until the onset of the first injury of this category. For match compared with training, and for men compared with women, relative injury risk (RR) and corresponding 95% confidence interval (CI) were calculated. Where possible odds ratios (OR) and the corresponding 95% CI were calculated for the factors associated with ankle sprains.

Recorded exposure and injury data of players without complete follow up were included in the analyses until they dropped out of the study. As exposure sheets provided hours of volleyball

participation and served as a control for the registration of injuries, players had to be excluded from further analyses once exposure data of their team were missing.

RESULTS

The non-response analysis showed that significantly more male than female teams did not participate in the study. For the other variables (that is, the number of players, age, volleyball experience, and the number of registered players in the club), no significant differences were found (data not shown). Of the 50 teams that agreed to participate in the study, nine dropped out after four months (that is, at follow up 1), and another three after nine months (at follow up 2). Baseline variables of these 12 teams did not differ from those of the other teams (data not shown). Exposure data were missing for four male and two female teams. Consequently, these teams were excluded from the analyses. Baseline variables for these six excluded teams did not differ from the other teams (data not shown). All the players from the participating teams reported that they were free from injury at baseline. This resulted in a baseline sample of 44 teams with 419 volleyball players (158 men and 261 women)

A total exposure of 44 891 hours was reported throughout the 36-week season, during which 100 injuries occurred. With a relative risk of 2.3 (95% CI, 1.5 to 3.7), the overall risk of injuries was higher for match play than for training. No differences between men and women were found for total, training, and match injury incidence. The overall mean (SD) absence from volleyball after injury was 4.3 (4.6) weeks. For men and women, the mean absence was, respectively, 4.1 (5.7) weeks and 4.4 (3.5) weeks (NS). With a total of 78 acute injuries, the acute injury incidence was 2.0 (95% CI, 1.5 to 2.4) per 1000 hours (table 3). With a relative risk of 2.4 (1.4 to 3.8) the risk of acute injuries was higher for match play than for training. The mean absence from volleyball after an acute injury was 4.0 (3.8) weeks. In terms of acute injuries, the lower extremity was the most commonly injured body region, with 65 injuries (83% of all acute injuries). Ankle injuries (n = 41), all sprains, accounted for most of these. The risk of ankle sprain did not differ between match and training, or between men and women.

During the season 25 overuse injuries were reported, the overall incidence of overuse injuries was 0.6 (0.4 to 0.8) per 1000 hours. The mean absence from volleyball because of an overuse injury was 4.0 (6.2) weeks, with the shoulder causing the longest absence (6.2 (9.4) weeks), followed by the knee (2.9 (1.8) weeks).While there were very few acute shoulder injuries, these injuries accounted for 32% of the overuse injuries. Back (32%) and knee injuries (20%) were the other main overuse injury types.

With an absolute number of 41 injuries and an incidence 1.0 (0.7 to 1.3) per 1000 hours, ankle sprain was the most common injury type. In all, 25 ankle sprains were sustained in the net zone (61%) (fig 1). The odds ratio for ankle sprains sustained in the net zone versus the backfield was 2.0 (0.7 to 5.8). Of all ankle sprains that occurred in the net zone, most occurred in contact with either a team mate or an opponent after a defensive action—for example, a block.

Three of the players (7%) were wearing ankle protection at the time of injury, while 31 (75%) of the injured players reported to have sustained a previous ankle sprain. Of these previous sprains, 11 (25%) were sustained within 12 months preceding the recurrence of the ankle sprain (fig 3). The odds ratio of recurrent ankle sprains within 12 months versus ‘‘fresh’’ ankle sprains was 1.9 (0.8 to 4.7). The overall mean absence from volleyball after an ankle sprain was 4.5 (3.6) weeks.

CONCLUSIONS

The overall injury incidence in volleyball was 2.6 per 1000 playing hours. The incidence of acute and overuse injuries was 2.0 and 0.6 per 1000 playing hours, respectively. The ankle sprain is clearly the most common injury in volleyball, accounting for 41% of all volleyball related injuries, with an injury incidence of 1.0 per 1000 playing hours. Although our study was limited to injuries causing absence from volleyball, ankle sprains should be of particular interest in studies on prevention strategies. Previous injury seems to be an important risk factor for ankle sprains. Thus, if an initial ankle sprain can be prevented the most important risk factor has been eliminated.

REFERENCES

1 Lausanne, Federation Internationale de Volleyball (FIVB). X-Press, 1994; 47, (Jan):1.

2 Bahr R, Karlsen R, Lian Ø, et al: Incidence and mechanisms of acute ankle inversion injuries in volleyball. A retrospective cohort study. Am J Sports Med 1994; 22:595–600.

3 Watkins J, Green BN. Volleyball injuries: a survey of injuries of Scottish National League male players. Br J Sports Med 1992; 26: 135–37.

4 De Loe¨s M. Epidemiology of sports injuries in the Swiss organization ‘‘Youth and Sports’’ 1987–1989: injuries, exposures and risks of main diagnosis. Int J Sports Med 1995; 16: 134–8.

5 Schafle MD, Requa RK, Patton WL, et al. Injuries in the 1987 National Amateur Volleyball Tournament. Am J Sports Med 1990; 18: 624–31.

6 Bahr R, Bahr IA. Incidence of acute volleyball injuries: a prospective cohort study of injury mechanisms and risk factors. Scand J Med Sci Sports 1997; 7: 166–71.

7 Van Mechelen W, Hlobil H, Kemper HCG. Incidence, severity, aetiology and prevention of SPORTS injuries. A review of concepts. Sports Med 1992; 14:82–99.

8 Aagaard H, Jørgensen U, Injuries in elite volleyball. Scand J Med Sci Sports 1996; 6: 22832.