

# Most frequent injuries in female handball players

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## ABSTRACT

*Objectives.* The main objective of this work was to assess the most frequent injuries in female handball players who played the premium Czech competition – *MOL League Women* – and the 3rd highest competition – *2nd League Women* – during the 2017/2018 season. The objectives also included ascertaining whether preventive and compensation exercises are included in the teams' training units.

*Methods.* The questionnaire method was selected. A non-standard questionnaire was sent out to all players in the two competitions. A total of 112 questionnaires were analysed.

*Results.* Injuries in the ankle area were found to be the most frequent type of injury, reported by 56.3% respondents. Injuries in the hand and knee areas followed, concerning 50.9% and 46.4% respondents, respectively. Recovery and compensation procedures were found to be inadequately used in the handball players' regime.

## KEYWORDS

handball; recovery and compensation in sports; injuries of athletes; injuries in handball; prevention; physiotherapy in sports

## DOI

10.14712/23366052.2019.9

## INTRODUCTION

Handball is a team sport in which the aim is to get the ball into the opponent's goal. Either of the two opponent teams has 6 players (three centre backs, two wings, one pivot) plus the goalkeeper. The players are active both in the offense and in defence so each of them has two tasks. The team that scored more goals is the winner, a draw being permissible. The rules permit one and the same person to be the goalkeeper and an offense player during a match (Tůma, 2017). Handball is a very vivid and variable game, motion changes, fast and short sprints and jumps being frequent. So a top-level player must have a well-developed athletic versatility. A player runs 2–6 km in average during a 60-minute match, the pivots and wings being most stressed from this aspect. Heart rate lies above 80% of the maximum. Lactate levels measured after a match reach up to 10 mmol/L, so the  $VO_{2max}$  data are above the average both in men (60 ml/kg.min) and in women (50 ml/kg.min). Anaerobic performance (strength, power, agility, speed) predominates during the match. Strength and speed of the throw rather than physical fitness are decisive in female players (Grasguber, 2008). Since handball is a very dynamic and contact sport, the incidence of injuries has been increasing during the past years, particularly due to contacts with opponents (Isaković, 2016).

This work was stimulated by previous studies that led us to point to the increasing number of injuries in this sport. This is particularly important because it suggests that more attention should be paid to adequate prevention in sports, specifically recovery and compensation exercises which should be an integral part of the training unit. Sprained ankle was among the most frequent diagnoses in the 1980s and 1990s (Radvanský et al., 2011). This is supported by current studies showing that the incidence lower limb injuries is higher than the incidence of upper limb injuries, sprained ankle being the most frequent injury: its incidence is 1.5 injuries per match, over one-half of the injuries resulting from contacts with opponents (Langevoort, 2007; Bere, 2017; Luig, 2011; Radic, 2013; Engebretsen, 2013; Giroto, 2017; Olsen, 2006).

## OBJECTIVE

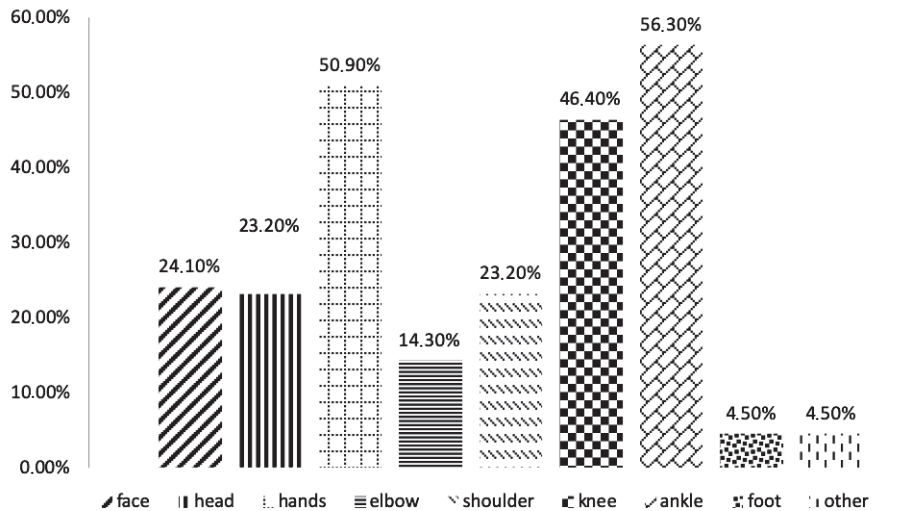
The objective of this paper, which is based on our long-term survey (Ragulová, 2018), was to analyse the most frequent injuries in female handball players who played the highest Czech competition, *MOL League Women*, and the 3rd highest Czech competition, *2nd League Women*, in 2017/2018, and to assess the level of recovery and preventive procedures in players in the two competitions.

## METHODS

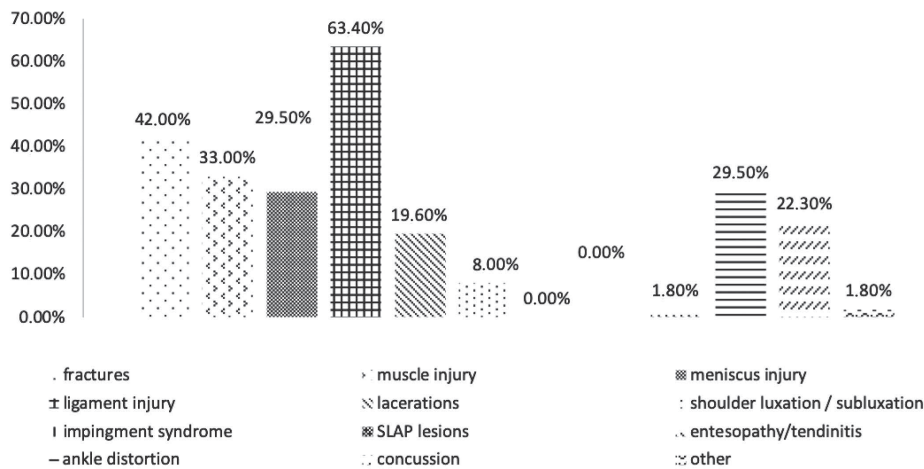
The study included eight *MOL League Women* teams and eleven *2nd League Women* teams. The data were obtained from the players by using an anonymous non-standardised questionnaire that was sent out among all *MOL League Women* and *2nd League Women* teams. Apart from questions targeting injuries, the questionnaire also contained questions concerning the inclusion of preventive and compensation procedures in the training unit. 48 (30%) from among the 160 returned questionnaires were excluded because they failed to meet the criteria set. Hence, 112 questionnaires (70%)

were included in the study: 56 from the *MOL League Women* players and 56 from the *2nd League Women* players, hence in the 50 : 50 proportions. The IBM SPSS Statistics 25 software was used to process the data obtained and provide the percent fractions of the answers. The chi square test confirmed or refuted postulated hypotheses at a significance level  $p = 0.05$ . The Microsoft Excel 2010 application was employed to set up graphs of the dependences observed.

From the questionnaires it was found that 89.3% of all the 112 players in the two competitions ever suffered injury during their player’s career, which is a fairly high figure. Equally in the *MOL League Women* and in the *2nd League Women*, 50 respondents had ever suffered a player’s injury whereas 6 had not.



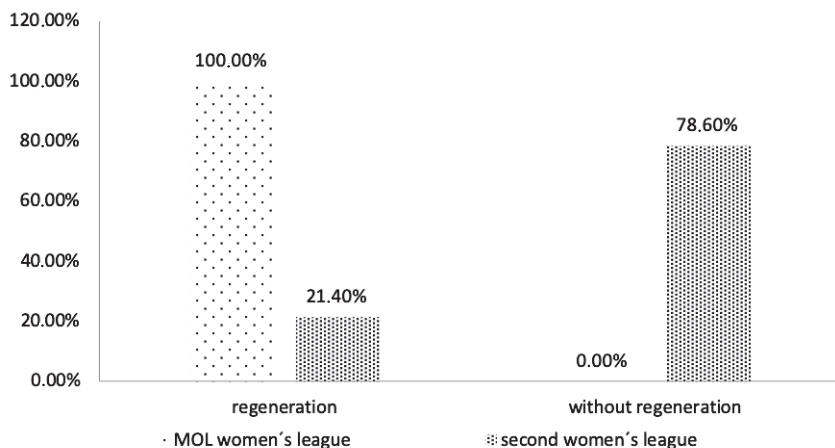
**Graph 1** Locations of the player injuries in the 2 competitions irrespective of age. Percent data (n = 112)



**Graph 2** Player injury types in the 2 competitions irrespective of age. Percent data (n = 112)

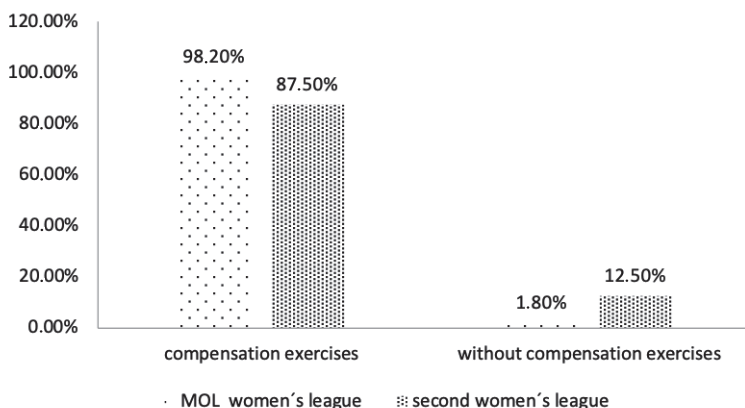
Among the respondents, had 92% suffered their injuries during a match, poor foot strike being the most frequent mechanism (57.1%) of the injury.

Handball has been enjoying rapid developed recently, particularly in speed and hardness, and so the incidence of injuries has been growing, regrettably starting from schoolchildren categories. So, body recovery and injury prevention should be in the focus of the trainers and physiotherapists starting from the athletes' early age.



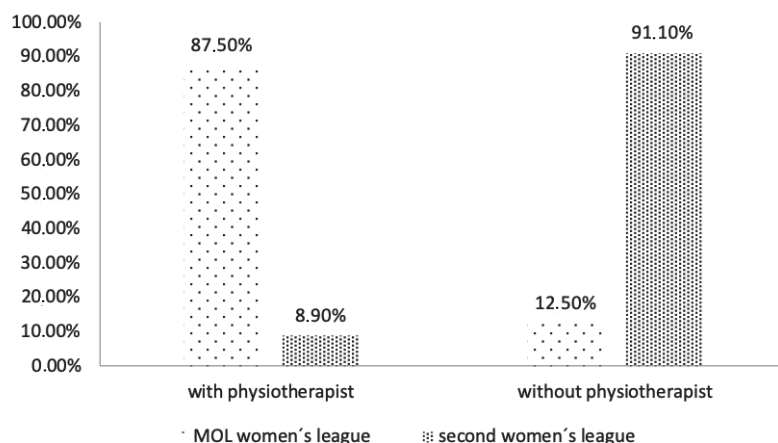
**Graph 3** Comparison of MOL League players (n = 56) and 2nd League Women players (n = 56) in dependence on recovery, percent data

All the 112 respondents, irrespective of the competitions they were engaged in, answered that their most frequent recovery methods included sauna (50.9%) and massage (40.2%).



**Graph 4** Comparison of inclusion of compensation exercises for MOL League players (n = 56) a 2nd League Women players (n = 56), percent data

The most frequent compensation exercise included short jogging before (67.9%) and after (63.4%) the training unit, and stretching before (75.9%) and after (66.1%) the training unit.



**Graph 5** Presence of physiotherapists in the competitions – the MOL League (n = 56) and the 2nd League Women (n = 56), percent data

We feel that the reason why the ankle is the most frequent injury site is that inadequate attention is paid to compensation exercises targeting stability of this body point, which might help reduce the incidence of this type of injury. Trainers and physiotherapists assisting the players should increase their focus on stability exercises, such as sensomotor exercises with labile platforms.

This research supports findings from previous studies concerning the incidence of injuries in female handball players. The ankle area is the most frequent site of injury in the players. Over one-half of the players had injuries on both lower limbs. As to the upper limbs, it was hands that were most frequently injured (stubbed or broken fingers). The most frequent typical injuries in the respondents included injuries of the ligaments; bone fractures and muscle injuries followed. The most frequent circumstance was poor foot strike and the injuries occurred most frequently during matches.

Although the survey included a low number of respondents, the incidence of injuries in female handball players appears to be alarming – 100 out of the 112 respondents had had one or more injuries during their player's career. Injury cannot be predicted but it can be prevented by applying appropriate preventive measures – by including correct compensation and recovery exercises. Not all respondents in the survey practise recovery and compensation exercises in their training units, and this may be a factor contributing to their injuries. Also important is the presence in the team of a physiotherapist who should see to it that correct injury prevention strategies are practised. Czech handball teams rather seldom include physiotherapists, and as a result, are not pushed to apply preventive procedures, and this may be one of the adverse factors contributing to the players' injuries.

## DISCUSSION

Injuries in handball players include both acute injuries and chronic injuries as a consequence of overload of a body segment or the whole body. If an athlete has suffered injury, he or she is partly or completely excluded from the training unit, whereby their athletic development is slowed down.

Our survey showed that the ankle area is the site that is most frequently injured (56.2%,  $n = 63$ ) among Czech female handball players. Also frequent are injuries of the hand (50.9%,  $n = 57$ ) and knee (46.4%,  $n = 52$ ). The most frequent injury types included ligament injuries (63.4%,  $n = 71$ ), bone fractures (42%,  $n = 47$ ) and muscle injuries (33%,  $n = 37$ ). This is in line with the findings by Beré published in the paper *Injury and illness surveillance during the 24th Men's Handball World Championship 2015 in Qatar* (2017). Beré recorded 132 injuries, in this 58.3% affecting the lower limbs, largely the ankle ( $n = 21$ ). Langevoort (2007), in his article *Handball injuries during major international tournaments* compared injuries that occurred during 6 matches and also found that ankle injuries were among the most frequent injuries (8%), only head injuries being still most frequent (14%). From among the 478 injuries, lower limb injuries were most frequent ( $n = 197$ , 42%). In his study *Incidence and risk factors of injuries in Brazilian elite handball players* (2017), Giroto compared injuries between Brazilian male ( $n = 156$ ) and female ( $n = 183$ ) handball players from a total of 21 teams. Among the total of 339 players, injuries of the ankle (19.4%) and of the knee (13.5%) were the most frequent acute injuries while shoulder was the most frequent site of chronic injury (44%). The most frequent acute injury types included muscle injuries (27.1%), sprained ankle (24.3%) and contusions (19.9%), while tendinitis (91.8%) was the most frequent chronic injury type. Olsen (2006) in his study *Injury pattern in youth team handball: a comparison of two prospective registration methods* examined the incidence of injuries in Norwegian male and female handball players. He divided the study groups into two subgroups. The one subgroup was denoted "Match report registration", which included injuries that occurred during a match within one playing season (90 teams registered, 49 injuries recorded). The other subgroup, referred to as "Coach report registration", was used to compare injuries from the long-time perspective (7 months) and occurring both during a match and during training (97 players were included in the study and 118 injuries were identified). Most frequent were ankle (26%) and knee (24%) injuries in both groups, sprain and contusions were the most types of injury.

## CONCLUSION

This survey gave evidence that, like in other countries, ankle is the most frequently injured part of the body in Czech female handball players. We also found that compensation exercises targeting ankle stability are inadequately included in the players' training units, and we suggest that this fact may be among the important factors contributing to the incidence of the injuries. We recommend that physiotherapists and trainers of handball teams should pay more attention to the application of preventive and compensation exercises and focus on stability training, for instance through simple sensomotor exercises with labile platforms.

## REFERENCES

- Bere, T., et al. (2015). Injury and illness surveillance during the 24th Men's Handball World Championship 2015 in Qatar. *British Journal of Sports Medicine*, 49(17), 1151–1156.
- Dirx, M. J. M., et al. (1992). Aetiology of handball injuries: a case-control study. *British Journal of Sports Medicine*, 26(3), 121–124.
- Engebretsen, L., et al. (2013). Sports injuries and illnesses during the London Summer Olympic Games. *British Journal of Sports Medicine*, 47(7), 407–414.
- Giroto, N., et al. (2017). Incidence and risk factors of injuries in Brazilian elite handball players: A prospective cohort study. *Scandinavian Journal of Medicine & Science in Sports*, 27(2), 195–202.
- Grasgruber, P., Cacek, J. (2008). *Sportovní geny*. Brno: Computer Press.
- Isaković, M., et al. (2016). The role of preventive practice in reducing the number of injuries of handball players. *Science, Movement and Health*, 16(2), 484–489.
- Langevoort, G., et al. (2007). Handball injuries during major international tournaments. *Scandinavian Journal of Medicine & Science in Sports*, 17(4), 400–407.
- Luig, P., et al. (2011). *Acute injuries in handball* [online]. Germany, 2011. Available at: [https://www.researchgate.net/profile/Patrick\\_Luig/publication/262887105\\_Acute\\_Injuries\\_in\\_Handball/links/0a85e5391932a27857000000/Acute-Injuries-in-Handball.pdf](https://www.researchgate.net/profile/Patrick_Luig/publication/262887105_Acute_Injuries_in_Handball/links/0a85e5391932a27857000000/Acute-Injuries-in-Handball.pdf).
- Olsen, O. E., et al. (2006). Injury pattern in youth team handball: a comparison of two prospective registration methods. *Scandinavian Journal of Medicine & Science in Sports*, 16(6), 426–432.
- Radic, V. (2013). *Acute injuries in handball* [online]. Handball Goalkeeper Coaching. Available at: <http://vanjaradic.fi/acute-injuries-in-handball>.
- Radvanský, J., et al. (2011). *Fyziologie a klinické aspekty pohybové aktivity*. Prague: Galén.
- Ragulová, M. (2018). *Zhodnocení nejčastějších úrazů u házenkářek MOL ligy a 2. ligy žen v České republice*. 87. Diploma thesis. Prague: UK FTVS.
- Tůma, M. (2017). *Elektronická studovna: Brankové hry II* [online]. Available at: <http://web.ftvs.cuni.cz/elstudovna/index.php?page=brankaII>.