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The most common injuries, rehabilitation and recovery among soccer practitioners

Karol Mojsiewicz[1], Agnieszka Kempinska-Podhorodecka[2]

[1]Student of Physiotheraphy, Department of Health Sciences, Pomeranian Medical University, 71-210 Szczecin, Poland
[2]Department of Medical Biology, Pomeranian Medical University, 70-111 Szczecin, Poland,

Abstract

Introduction. Soccer is the most popular sport in the world. As a contact sport it has a high risk and incidence of injuries, which most often affect the lower limb. For the player to recover it is neessary to attend to well planned rehabilitation.

Purpose. Analyzing the most common injuries among people practicing soccer and determining the role of rehabilitation in the treatment of these injuries.

Material and methods. The research group was 101 individuals, 88 male and 13 female who played soccer as amateurs or professionals, aged 10 to 45 and had been training for a minimum of 2 years.

Results. There were 487 injuries in total among all respondents, of which 370 were related to the lower limb and 117 to the upper body. Contussions and ankle sprains were the most common injuries. Every single preson included in the studies suffered from injury, but only 75.2% of them went to see a doctor after the incident and only 56,4% attended

rehabilitation. Statistical significance has been present in the time to return to sports depending on the continuation of physical exertion after the injury, in the time to return to sport due to treatment or the lack of it, in the time to return to sports in relation to whether or not rehabilitation took place for patients with serious injury.

Conclusion. The most common sports injuries in soccer are lower limb injuries, including damage to muscles and tendons. Recovery time is related to the type of injury, treatment options and rehabilitation methods. People practicing soccer should monitor their training loads with a physiotherapist. This can reduce the amount of problems later in career or daily life.

Key words: soccer; rehabilitaion; injuries.

Introduction

Soccer is the most popular sport in the world. Over 500 million people play it actively, about 300 million of whom are registered with clubs [1]. For this reason, there is a lot of scientific works describing trauma in this sport. Unfortunately, in the conducted research, there are many inaccuracies related mainly to the research methodology, such as the definition of the term sports injury or the individual characteristics of the studied players [2]. The following study defines a sports injury as tissue damage occurring during a sports match or training, forcing the player to refrain from practicing the sport for at least one day. However, this concept does not apply unequivocally to all people practicing sports, because a person who does not train professionally is considered to be completely healthy, when able to carry out his daily duties and the athlete must be ready to train or play at the highest possible level. [3,4]

Soccer is a complex contact sport with a high risk and incidence of injuries among professional players, training children and amateurs [5]. According to studies conducted among adult men professionally practicing soccer, 10-35 injuries occur per 1000 hours of play, while among adult women practicing this discipline, 2-24 injuries occur per 1000 hours of play [6]. The most common are lower limb injuries, and among them the most common are muscle and tendon injuries. [7,8,9]

Well-planned rehabilitation is usually necessary for an athlete to resume activity after an injury. The effective return to the best possible form is possible mainly due to careful selection of the appropriate training to the competitor's abilities [10]. Its important elements are restoring the quality of movement, endurance and strength. In the next part, it is necessary

to take care of skills specific to a given sport discipline, and the whole training load should be progressively increased, up to the highest possible fitness of the competitor [11]. However, physical factors are not the only elements necessary to ensure full recovery. Apart from them, there are equally important mental factors, influencing, among others, the athlete's return to the possibilities and level of activity from before the injury. Many professional athletes do not decide to re-enter the official competition due to the fear of another injury, as well as due to the pressure exerted by the environment (e.g. coaches, media, sponsors), so it is very important to take care of the psychological aspect of rehabilitation [9,12,13].

Purpose

The aim of the research is to analyze the most common injuries among people practicing soccer and to determine the role of rehabilitation in the treatment of these injuries.

Material and methods

The study involved 101 people, including 88 men and 13 women, aged 10 to 45 (mean 26.1, SD = 7.96), having a Body Mass Index of 14.5 to 45.2 (mean 24.4, SD = 4.23) and training from 2 to 40 years (mean 15.5 years, SD = 8.22) (Table 1). The Body Mass Index was calculated according to WHO standards [14].

Table 1. Group characteristic

Characteristic	**Results**	
Male	87,1%	
Female	12,9%	
Age	10 - 45 years	average 26,1 ± 7,96
Years of practice	2 - 40 years	average 15,5 ± 8,22
Body Mass Index	14,5 - 45,2 kg/m^2	average 24,4 ± 4,23
Level of advancement		
Professional	13,9%	
Non professional	86,1%	

The survey was conducted among groups associating people interested in the subject of soccer on Facebook.com. There were 23 questions in the survey, 9 of which were open-

ended, 10 single-choice and 4 multiple-choice. They concerned the subject of past injuries, treatment time and recovery after the injury, as well as visiting a specialist (doctor, physiotherapist). The research was commenced after consultation with the Bioethics Committee at the Pomeranian Medical University. The study was conducted in the period from January 24, 2021 to April 9, 2021. Due to the COVID-19 pandemic prevailing at that time, an anonymous author's survey was conducted in the form of an online questionnaire.

The core variables characterizing the community have been the duration of treatment and return to training. And for these variables, the main tool of analysis was the in-state duration analysis, also known as survival analysis. Hence, the Kaplan-Meier estimator has been used to estimate percentiles of in-state duration. Responses of no return to training and uncompleted treatment were considered censored observations. The past durations of both conditions were calculated for these respondents.

Comparisons of duration in state of two or more subgroups have been made for the entire population exit curve. For this purpose, the following tests Wilcoxon by Gehan, Cox-Mantel and log-rank have been used. In further analysis, both whether the differences were confirmed by one of the three tests or when they all indicated statistically significant differences at a significance level below 0.05 were noted.

Results

Most of the respondents (73.2%) lived in cities with more than 25,000 inhabitants. Out of all respondents, 13.9% described themselves as professionally practicing soccer, and 86.1% as amateur footballers (Table 1). When asked about the number of training units per week, 20.8% of people answered that they train less than once a week, 16.8% people once a week, 33.7% people twice a week, 10.9% people 3 times a week, 17.8% of people more than 3 times a week.

There were 487 injuries in total among all respondents, of which 370 were related to the lower limb and 117 to the upper body. Contusions were recorded most of all types of injuries (235), of which 151 concerned the lower limb and 84 the rest of the body. In total there were 71 people who suffered contusions (Fig. 1).

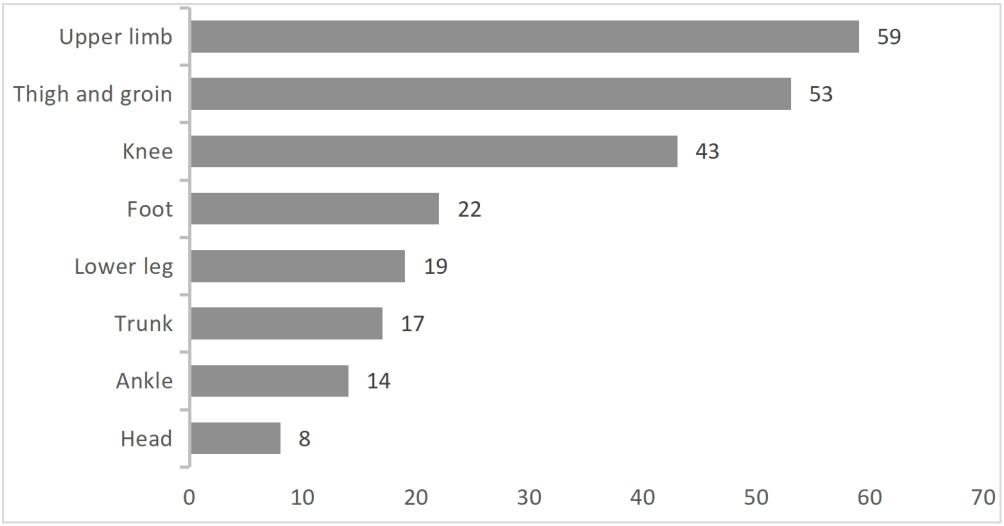

Fig. 1. Number of contusions and location

Table 2. Types and locations of injury without contusions

Type of injury	**Location**								**Total**
	Head	Upper limb	Trunk	Thigh and groin	Knee	Lower leg	Ankle	Foot	
Luxation	1	2	0	0	4	0	13	10	30
Sprain/twist	1	1	1	0	2	1	37	7	50
Fracture	1	11	0	0	0	1	1	6	20
Muscle/tendon rupture	1	1	1	5	4	3	5	1	21
Muscle/tendon slight tear	2	0	0	7	12	2	6	5	34
Muscle strain	1	1	8	37	5	20	4	7	73
Meniscus damage	0	0	0	0	14	0	0	0	14

In the further part of the survey, one injury was distinguished, which was then analyzed. There were 12 fractures, 36 microtraumas (contusion, muscle strain, muscle tear), 10 cases of rupture and tearing of the ligament in the knee and 4 in the foot, 6 injured menisus, 30 ankle sprains and two knee sprains, one tibial tuberosity necrosis. The most common injuries were microtrauma (35.6%) and ankle sprains (29.7%). The most common areas of the injury were the ankle (33.6%) and the knee (20.1%).

The first question concerned the moment when the injury was suffered, to which 66 people (65.3%) replied that it was during the match, 26 people (25.7%) that it was during training, 3 people (3%) during warm-up, 6 people (7%) answered other. The next questions were asked about the cause of the injury, including the possibility of a multi-factor injury (Table 3).

Table 3. Causes of injuries

Mechanism of injury	**Number of cases**
Incorrect warm up	25
Third party	64
Overtraining	17
Unhealed injuries	17
Problem with the pitch	32
Other	15

When asked if the athlete decided to consult a specialist (doctor or physiotherapist) after the injury, 76 respondents (75.2%) answered yes, and 25 (24.8%) no. Then, when asked about rehabilitation after treatment, 57 (56.4%) positive and 44 (43.6%) negative answers were obtained.

The most frequently used type of physiotherapy among the respondents was physical therapy (35 cases), 17 people went to manual therapy, 11 people benefited from a massage, and 18 people indicated other answers.(table 4).

Table 4. Types of physiotherapy used

Type of physiotherapy	**Number of cases**
Physical therapy	43,2%
Massage	21%
Manual therapy	13,6%
Other	22,2%

Comparisons of treatment time to individual characteristics were made, and the following results were obtained. The duration of treatment based on gender showed no statistically significant differences (Gehan Wilcoxon test = -0.056076, Cox-Mantel test = -

0.231814, log-rank test = 0.2350944), overweight in relation to the treatment time showed no statistically significant differences (Gehan Wilcoxon test = 0.7823226, Cox-Mantel test = 0.1723111, log-rank test = -0.174725)

Half of the injured were cured in less than 4 weeks, 25% of the respondents cured in less than 2 weeks, and 25% in more than 8 weeks.

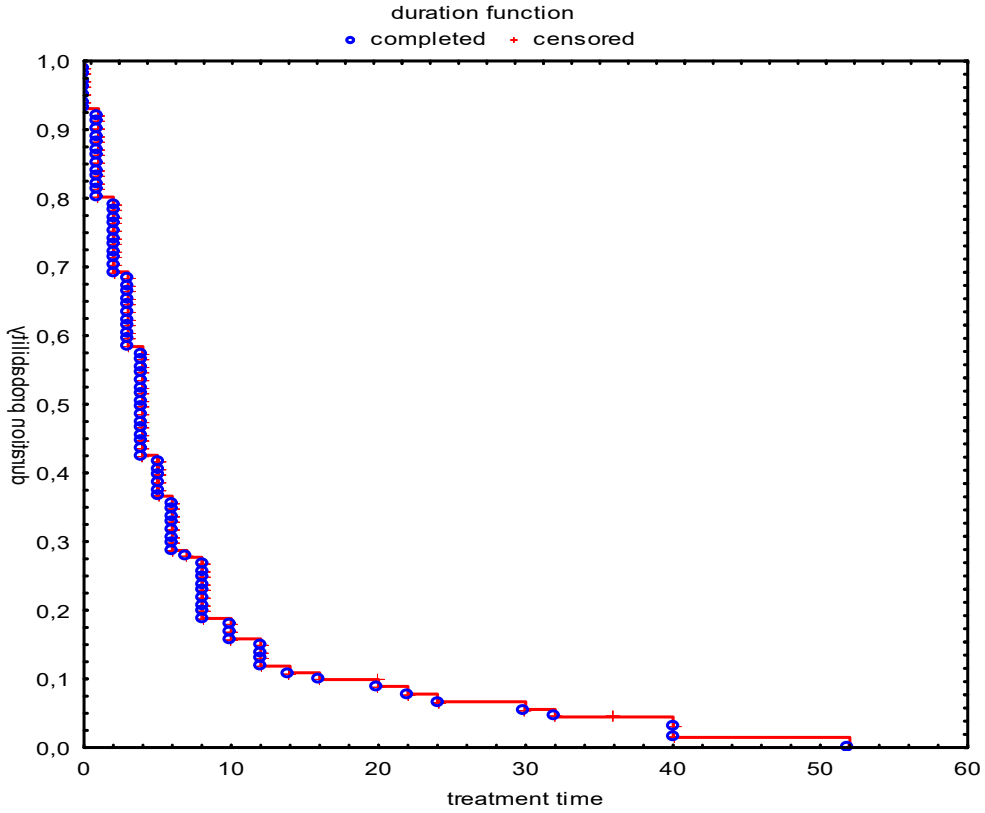

Fig. 2. Treatment time across the group

The treatment time in relation to amateur and professional sports did not show statistically significant differences (Gehan Wilcoxon test = 0.2025607, Cox-Mantel test = 0.4053642, log-rank test = -0.385051). Duration of treatment depending on the continuation of physical exertion after the injury showed statistical significance (Gehan Wilcoxon test = -2.54354, p <0.02). The other tests did not show this significance.The shorter treatment time was associated with the type of injury that occurred during exercise, because microtrauma - contusion, muscle strain, they do not require interrupting the game or a long recovery time [4].

After dividing the respondents into 2 groups - a group of people who have suffered a microtrauma and a group of people who have suffered a serious injury, these groups were compared due to going to physiotherapy and not going to physiotherapy. The result was that

the treatment time in relation to whether or not rehabilitation took place, for the group of people with serious trauma, showed no statistically significant differences, although the significance level was lower than 0,1 for the Gehan Wilcoxon test (= 1.846586, p = 0.06481) and Cox-Mantel test (= 1.662066, p = 0.09650), log-rank test = -1.52231.

Half of the injured returned to sports in less than 6 weeks, 25% of respondents in less than 2.25 weeks, and 25% in more than 10 weeks .

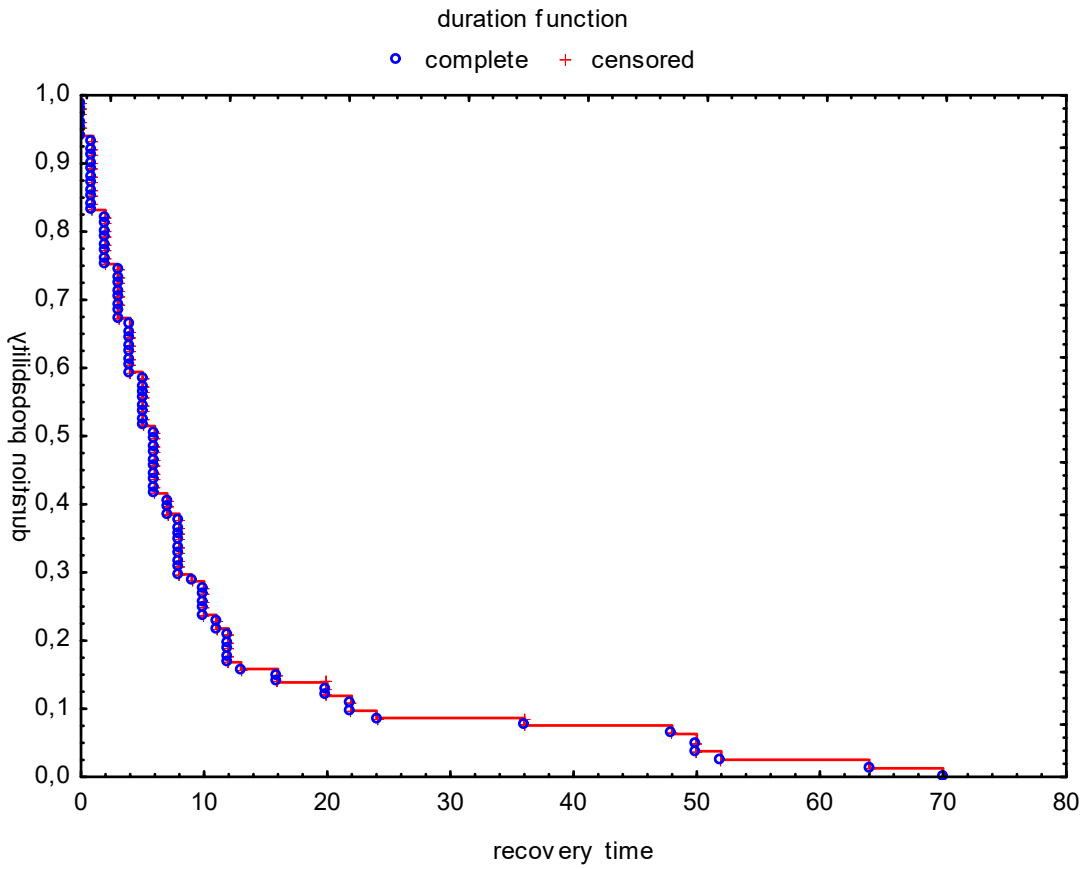

Fig. 3. Recovery time across the group

The time of return to sport due to gender did not show statistically significant differences (Gehan Wilcoxon test = -0.020342, Cox-Mantel test = 0.0649735, log-rank test = 0.063763). The time to return to sports due to overweight did not show statistically significant differences (Gehan Wilcoxon test = 0.7769166, Cox-Mantel test = 0.2129365, log-rank test = -0.216057)

The time of returning to sport due to its professional and amateur practice did not show statistically significant differences (Gehan Wilcoxon test = 0.5519993, Cox-Mantel test = 0.6337000, log-rank test = -0.587528)

The time to return to sports depending on the continuation of physical exertion after the injury showed a statistically significant difference (Gehan Wilcoxon test = -2.48268, p <0.02). The other tests did not show this significance. The shorter recovery time to sports was associated with the type of injury that occurred during exercise, because microtrauma - contusion, strain muscle, they do not require interrupting the game or a long recovery time [4].

After dividing the respondents into 2 groups - a group of people who have suffered a microtrauma and a group of people who have suffered a serious injury, these groups were compared due to going to physiotherapy and not going to physiotherapy. The result was obtained where the time to return to sports in relation to whether or not rehabilitation took place, for a group of people with serious injuries, showed a statistically significant difference (Gehan Wilcoxon test= 2.355551, p = 0.01850, Cox-Mantel test = 2.412355, p = 0.01585, log-rank test = -2.04895, p = 0.04047).

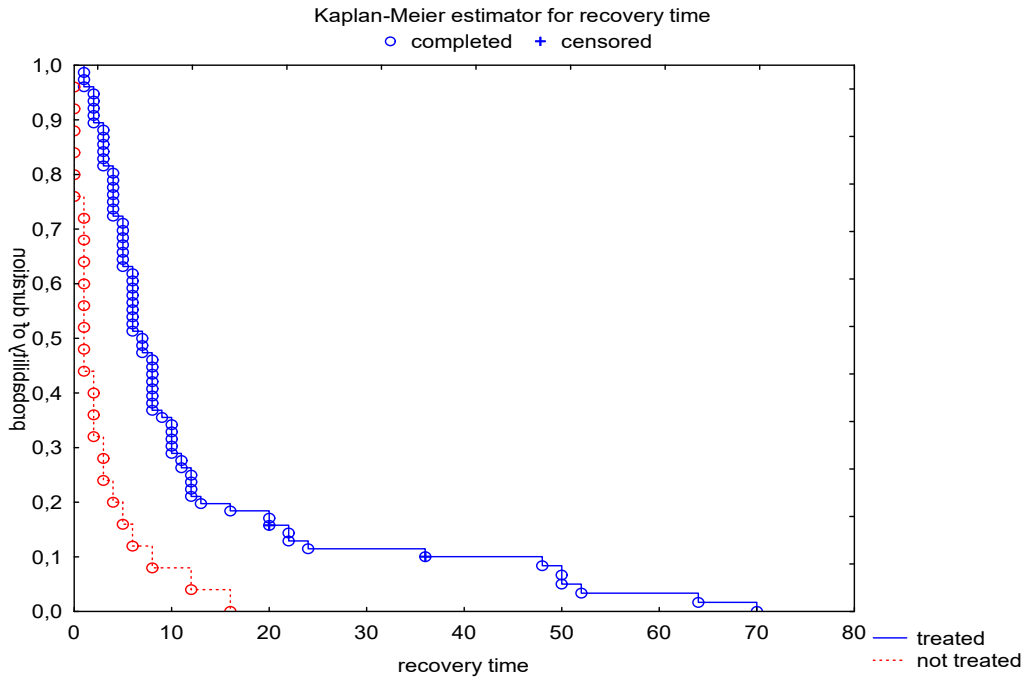

Fig. 4. Recovery time due to treatment or no treatment

The time to return to sport due to treatment or the lack of it showed a statistically significant difference (Gehan Wilcoxon test = 5.216736, p <0.00001, Cox-Mantel test = 5.525605, p <0.00001, log-rank test = -3.82855, p <0.0001). The shorter treatment time was associated with the type of injury that occurred during exercise, because microtrauma - contusion, strain muscle does not require long treatment [4].

Discussion

Major findings of the research was finding that the time needed to return to sports among seriously injured people is statistically significant depending on the rehabilitation. A similar relationship occurred between the time of returning to playing soccer and going to treatment. When examining this result, it was noticed that people who failed to undergo treatment usually suffered from microtrauma, such as contusion, muscle tear, muscle strain, which did not require going to a specialist [4].

The continuation of physical exertion after the injury was also statistically significant in relation to the treatment time and the time to return to sports. This was due to the severity of the injury, as the people who continued to exercise after the injury were mostly contusions, strains, or tears. These were minimally invasive cases and did not require interrupting the game or training [15]. The median time to complete treatment was 7.06 weeks and the median time to return to sports was 8.5 weeks.

Soccer is considered a contact sport [16], therefore people taking an active part in it are exposed to frequent injuries. According to research, lower limb injuries occur most frequently on the pitch during soccer practice [5,17,18,19]. After analyzing the answers of the respondents, similar results were obtained, because as much as 76% of all injuries concerned the lower body. The most common injuries were microtrauma - 66.4% of all lower limb injuries, and the second most common injury was ankle sprain - 13.5% of all lower limb injuries. One can risk a statement that some researchers did not mention microtraumas in their research because they did not force players to report injuries. They usually indicated an ankle sprain as the most common injury in soccer [4,5,6,7,17,18,19]. Other authors included micro-injuries in their results [20,21,22] and in these cases reported micro-injuries as the most common or as frequent as sprains. the differences between the studies may result from the diversity of the study groups and the non-uniform definition of the word "sports injury".

Injuries usually have different origins and can have many overlapping factors. In the conducted study, information was obtained about the cause of the injury and the moment in which it occurred. The most common cause of injury was the participation of third parties (63.3%) [18], and the most common injury occurred during a match (65.3%) [5,21,23,24]. Not all authors agreed with these results. Some [20,23,25,26,27] indicated injuries without the participation of third parties as the most frequent, others [20,23,28] observed more frequent injuries during training than during the match. It is important to pay attention to the

differences in the study groups, because amateur footballers spend fewer hours in training than professional footballers.

Conclusion

The most common sports injuries in soccer are lower limb injuries, including damage to muscles and tendons.

Recovery time is related to the type of injury, treatment options and rehabilitation methods.

People practicing soccer should monitor their training loads with a physiotherapist. This can reduce the amount of problems later in your career or in your daily life.

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