

THE TYPICAL INJURES OF MOTOR ORGANS IN SNOWBOARD

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Abstract

The aim of the study was the attempt to determine the specifics of injuries suffered by people who do snowboarding recreationally. On account of the low number of cases one should determine the work as descriptive study.

Methods. The research material was a group of 40 persons aged 18-30 practicing snowboarding. The research tool was a questionnaire prepared by the research authors.

Results and Conclusions. The most frequent type of injury suffered by the questioned snowboarders was contusion (67,5%) and dislocation (50%) of joints. Injuries concerned the upper limb mainly (injures of the wrist/palm - 50% of all) and the basic form of physical therapy applied in the examined group was criotherapy.

Key words: snowboard, injures of motor organs, physiotherapy

Introduction

The global, dynamic development of various branches of sport, both the recreational and professional ones, is a positive trend on one hand, yet on the other it creates the risk of injuries, first of all of the motor organs, but also – though to much lower extent – damages to the internal organs.

The disciplines which are the most common reasons for injuries include a number of sports. Apart from the contact sports, which are considered the most risky in this respect, such as: hockey, basketball, football, handball or wrestling, the list includes also horse riding, cycling, skiing, snowboarding, volleyball and tennis [1].

One should emphasize the fact that the vast majority of injuries occur in the case of people who practice sport recreationally. This may be the consequence of the lack of correct physical preparation on the part of those persons, as well as the fact that the number of people doing sport recreationally is much higher than the number of professionals.

One of the “mass” winter disciplines is snowboarding. Nowadays, this discipline dominates among sports chosen by young people. As a result of its typical “free” style, persons doing this discipline already form a separate subculture.

Due to the specifics of snowboarding, most injuries are upper limbs injuries (mostly palms). They occur

when we forget to support ourselves with forearms while falling and use hands [2].

Though the more advanced snowboarders may attempt more and more difficult manoeuvres such as jumps and other evolutions in the air, the beginners frequently suffer injuries. Nearly one fourth of all injuries take place during the first contact with the board, and nearly a half of the injuries occur in the first training season. The first typical experience connected with a snowboard usually involves a cycle of short slides which end with a fall. Therefore, falls are the main reason for injuries in snowboard [2].

Snowboard jumps are the second most common reason for injuries and may involve injuries of head, face, spine and abdomen. Collisions and clashes account for 5%-10% of injuries. Serious accidents are rare. The most common reason for serious injuries is a collision with a tree. Serious injuries usually are head injuries (54%), abdomen (32%), bones (32%) and chest (16%) [2].

The percentage of upper limb injuries in all injuries in snowboarding is growing. Their number increased from one fourth of all injuries at the beginning of 1990s to nearly one third currently. The leading arm (hand) seems to be slightly more prone to injuries. The most frequently injured place is the wrist – nearly one fourth of all injuries and half of all cracks and fractures. Other frequent places of fractures include the clavicle and

the elbow. Meanwhile, the shoulder (arm) is the place which is most frequently dislocated – two thirds of all cases of dislocation [2].

In comparison to the skiers, the snowboarders are more at risk of wrist injuries, but are less prone to knee injuries (16% in comparison to 3%). Despite the lack of „releasing” binding, knee injuries in the case of snowboarders seem to be less serious than the ones suffered by experienced skiers [2].

Another body area which is at risk of trauma in the case of beginning snowboarders is the back of the head. Fortunately, the force acting on the head is usually relatively moderate, because it is first absorbed by the buttocks, back and upper limbs, and therefore usually the only consequence of the impact is headache. Many coaches recommend the snowboarders to wear helmets during their early attempts to do this sport, which significantly decreases the severity of the head injuries [2].

The aim of the study was the attempt to determine the specifics of injuries suffered by people who do snowboarding recreationally.

Material and Methods

The research material was a group of 40 people (20 men and 20 women) aged 18-30 practicing snowboarding recreationally for 1 – 11 years. The research was carried out in the period 2009 to 2010 on the skiing slopes of Podhale (the area of Nowy Targ and Zakopane).

Only 10 persons (25%) out of 40 declared that while learning snowboarding they took advantage of instructor's assistance.

The research tool was a questionnaire prepared by the research authors. The questionnaire included

25 questions comprising 3 open questions, 14 closed questions and 7 half-closed questions. In the case of 9 questions, the respondents could choose more than one answer from a list of options.

The questions concerned personal data, technical data, the reasons for injuries, the mechanisms of injuries, the location and kinds of the injury and prevention of the injury.

The respondents' answers were subjected to a descriptive statistical analysis and the numeric and percentage data summarised in tables and presented in the form of diagrams.

Low number of cases made a statistical tests impossible for the validation of the results.

Results

Following the analysis of the answers provided by the respondents in the questionnaires, out of 40 persons doing sport recreationally, 37 suffered injuries and 3 stated that they did not suffer any injury while snowboarding.

The research proved that more than 50% of the respondents – 23 people, do not use any protection pads, which are used only by 17 persons. Only 6 women declared that they protected their bodies against injuries. Half of the men – 11 out of 20 were aware of the risk and used protection while snowboarding. The protection form which was most frequently used by women is a helmet.

The research also shows that men protect various body parts more frequently than women (Table 1).

The questionnaire has shown that only 25% of women prepare their shape before the season. The

Table 1. *Protective equipment*

	head	wrist	knees	spine	hips	coccyx	hands	thighs	summary
women	4	2	1	–	–	–	–		7
men	3	3	–	3	1	2	1	1	14

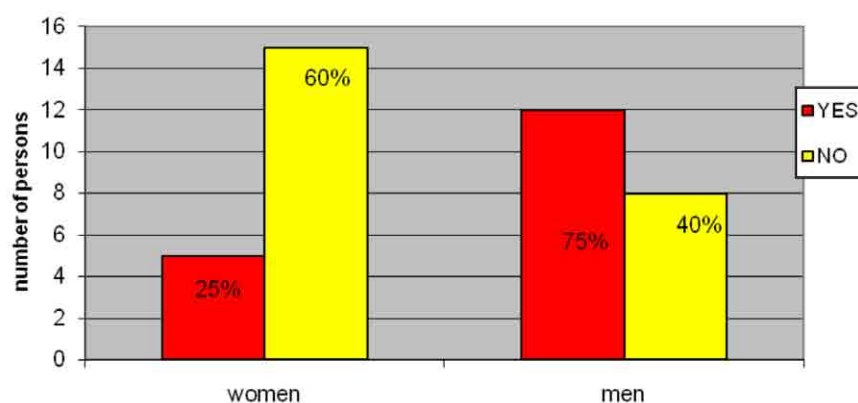


Fig. 1. *Athletic preparation for the season*

data concerning men is more satisfactory: in their case 60% declared that they do not start the winter season before preparing their body to physical effort (Fig. 1).

The general summary of the results from all questionnaires shows that 60% of the respondents do another sport discipline apart from snowboarding.

Snowboarding fans frequently forget to prepare their bodies for effort; what is more, the warm-up on the snow before the first slides is rare among snowboarders, which is illustrated by Fig. 2.

Unfortunately, only 9 people remembered to warm up before snowboarding and declared they do it on regular basis – they account for only 22.5% of the respondents. 23 do it sometimes, while 8 persons never.

According to respondents the most frequently described injury location was the wrist/palm – 8 women and 12 men – 50%. The second most frequently described injury place was the shoulder – 27,5% (Table 2).

The most frequently reported injury type was the dislocation of the wrist joint/palm (10 cases), wrist

contusion (6 cases) and sprains (4 cases). Another most frequent injury type was the contusion of the knee joint (9 cases), as well as knee dislocations and sprains. The situation looks similar in the case of the elbow and shoulder joint, where the most frequent injury type was contusion (6 cases), while dislocations were rarer. Accidental cases of contusion may include: ankle sprain and shoulder dislocation (Table 3).

Bone fractures are the most rarely reported injuries. The analysis of the questionnaires show that both in the case of women and men the most frequently injured bone is the radial bone (9 cases). The second most frequent place are the metacarpal bones – reported by 4 respondents. There were also single cases of fractures of the radial, elbow and wrist bones. Two men suffered rib injuries and the same number of respondents reported clavicle injuries. Out of all the respondents, the percentage of persons who suffered a bone fracture was higher among men than women (Table 4).

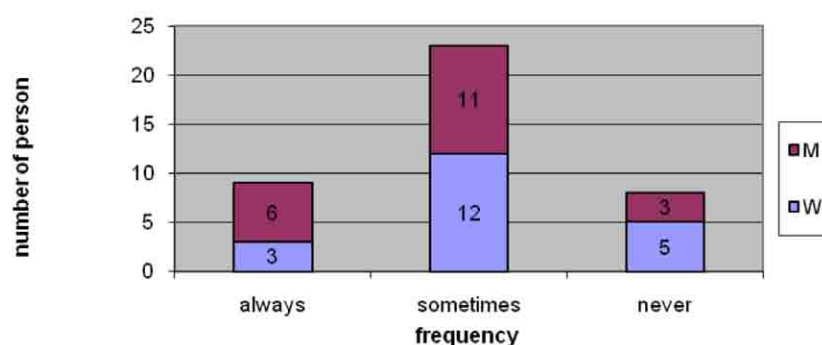


Fig. 2. Numerical data concerning person warming up before snowboarding

Table 2. *The most frequently described injury location**

joint	Female	Male	%
shoulder	4	7	27,5
elbow	6	3	22,5
wrist/palm	8	12	50
knee	7	3	25
ankle	2	–	5

* Amount does not equal 100%, as respondents could give more than one answer

Table 3. *The most frequently reported injury type**

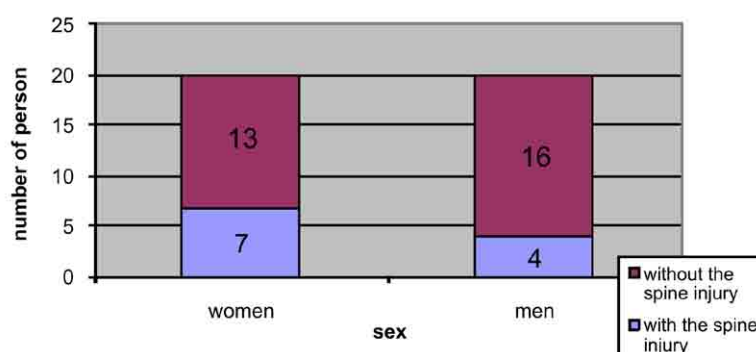
joint	sprains	contusion	dislocation	summary
wrist/palm	4	6	10	20
knee joint	3	9	3	15
elbow	–	6	3	9
ankle joint	2	–	–	2
shoulder	–	6	4	10
%	22,5	67,5	50	

* Amount does not equal 100%, as respondents could give more than one answer

Table 4. *The most frequently reported fractures**

bone fracture	female	male	%
humeral bone	1	–	2,5
ulnar bone	2	1	7,5
radial bone	4	5	22,5
wrist	2	–	5
tibia	1	–	2,5
ribs	–	2	5
metacarpals bones	1	3	10
clavicle	–	2	5

* Amount does not equal 100%, as respondents could give more than one answer

Fig. 3. *Spine injuries*

What is more, in single or several answers the respondents reported that they have suffered injuries of another type: they had their muscles and tendons stretched, torn or pulled. The biggest number of cases – 5 – were the cases when the thigh quadriceps was pulled.

The analysis of the results concerning spinal injuries shows that 11 persons experienced this type of injury – they account for 27.5% of the respondents. Usually this injury affected women and pertained to the lumbar-sacral and sacral section. There were also rare cases of injury of the neck and lumbar section (Fig. 3).

Unfortunately, 25 persons (62.5%) did not follow any physical therapy after the injury, only while 15 persons answered positively (37.5%)

In the case of persons who took advantage of physical therapy kriotherapy procedures were applied in almost each case. Another frequent procedure used in physical therapy was magnetotherapy. The following procedures were also listed: paraffin compresses, centrifugal baths, Trabert currents, ultrasounds or massage and kinesiotherapy.

Most persons recovered in the period of 1-3 months.

In the case of 3 people complications occurred, while 14 (35%) of the respondents stated they were

still experiencing problems related to the injury they suffered.

Discussion

The biggest number of skiing accidents last season took place during the winter holiday 2009, when the TOPR rescuers carried out 1025 interventions [4].

The most frequent reasons for skiing accidents are insufficient skiing skills and bravado.

– *The skiers often fail to account for the other participants of the skiing slopes, for example by blocking the way of a person who has a worse command of their skis or the board,* says Tomasz Wojciechowski, a rescuer on duty [4].

The TOPR rescuers and the questionnaire results suggest and the most common injuries among snowboarders are injuries of arms, mostly wrist and forearm fractures, as well as shoulder dislocations.

Snowboarding may be the source of joy, but it also creates the risk of injury. Such injuries may be suffered both by the beginners training on a bunny hill and by experienced sportsmen. To limit the possibility of injury or decrease its effects, appropriate protection measures are applied. Nevertheless, one should remember that the best way of preventing injuries is common sense and appropriate preparation for this sport [5].

According to data given by the Buchbacher et al., snowboarding is the most dangerous winter sport, followed by downhill skiing and then – jointly – sledging and bobsleighs [3].

While discussing the safety on skiing tracks, one should use the statistical data collected over the period of several years, since the last two seasons, especially the 2006/2007 and 2007/2008 ones are not representative due to extremely unfavourable weather conditions in the skiing regions. Untypical snowless winters with long periods of positive temperatures which did not allow applying the artificial snow caused shortening of the skiing lift operation period even to several or a dozen or so days per season. This had obvious impact on the statistics of the number of accidents on the slopes [4].

While analysing the statistical data for the period of the last 10 years, we observe a constant increase of the number of rescuers' interventions from 4-8% to 44-66%. It is a worrying fact that over the last 10 years the number of rescuers' interventions increased by more than 300%. It happened despite the improvement of the condition and preparation of tracks and slopes. The progress in this area is unquestionable. Also the equipment used by skiers is getting better and better year after year. Likewise, the equipment offered for rent is more and more modern, more carefully fitted and maintained in a better way [4].

All those activities should have led to improvement of safety on skiing slopes, i.e. also to limiting the number of rescuers' interventions. However, the statistics do not confirm such dependence. One could point to several reasons for this phenomenon, which seems illogical according to the classic logics rules. Basically, those reasons boil down to a thesis known from several other areas, i.e. that the weakest link in this system is the man. Due to our weaknesses, we fail to keep up the pace with changing conditions, improvements in technology and equipment. This mostly pertains to the appearance of a large number of fans of snowboarding and carving skis [6].

In the prevention of snowboard injuries preparing the motor organ for the season and conducting the warm-up before the ride and applying protective equipment are playing a significant role

The results of the questionnaire show that only 22,5% of cases applies the warm-up.

Omitting this element is a mistake because allocating a few minutes for the warm-up can largely contribute to reducing the risk of the injury, or straight out avoiding an accident on the slope.

Also applying protective equipment is affecting the prevention of injuries [7,8,9]. Unfortunately only 42.5% of respondents stated that they applied them.

Reducing the risk of appearing of injuries to the motor organ among snowboarders is being searched

out in physical preparation for the season [10]. Conducted examinations are pointing, that mainly men (60%) are implementing the training before the season.

Connecting the warm-up, applying pads and the physical preparation before the season could reduce the risk of appearing of injuries to the motor organ.

The results of the questionnaire show that the most frequently reported injury location is the upper limb – the wrist/palm (50% of the respondents). Slightly less frequently the injuries of the knee joint (mostly in women) and the shoulder joint (mostly men) occur. The third position is the elbow joint. World literature is informing, that upper limb is among snowboarders predominating place of injury [11,12,13]. Young at al. ascertains also, that injuries of upper limb and ankle joint occurs more often than knee joint, that partially confirms results of personal research [11]. Sasaki et al. serves, that the most frequent kind of injuries in upper limb are fractures in the wrist and elbow dislocations [14].

Snowboarders also suffer from spinal injuries. According to the questionnaire, the injuries usually pertain to the lumbar-sacral and sacral sections of the spine (27.5% of which majority were women have suffered such injury). Results of research of other authors indicate, that head injuries present considerable group beside injuries of spine. Risk of injury may be lowered by using protective equipment, such as a helmet [8,9]. The primary mechanism of spinal cord injury among snowboarders is jumping. Burst fractures are the most common type of fracture, followed by anterior compression fractures [15].

The statistical data published in *American Family Physician* by the Medical College of Wisconsin employees differ from the ones presented in this paper [11].

They also show that the wrist is at the highest risk of injury, but according to their research cracks and fractures accounted for 50% of cases. The authors also stated that other frequent places of fractures included the clavicle and elbow, while the shoulder was the most frequent joint to be dislocated (2/3 of all dislocations) [11].

The own research showed that the bone fractures and cracks are less common injuries.

Also the results obtained by Langran [5] are different. Here also the wrist (with significantly higher result in comparison to the other body parts) turned out to be the most frequently injured area in snowboarding (24.9% of injuries). The second most frequently injured body part is the head/face, followed by: arm, knee, ankle, back.

The presented results and the results obtained by other authors with respect to injuries in snowboarding vary. However, without a doubt, in each case the upper limb – and the wrist mostly – is the body part

which most frequently injured. These data suggest that beginners should have appropriate lessons of basic skills including safe falling. The development of a safety system also appears sensible to prevent such severe injuries in snowboarding.

Snowboarding is a young discipline in comparison to other winter sports, but year after year its popularity is increasing. The equipment is subject to constant improvement, which means changes to the comfort snowboarders may enjoy.

Conclusions

The most frequent type of injury suffered by the questioned snowboarders was dislocation and contusion of joints. Injuries concerned the upper limb mainly (wrist, palm).

The basic form of physical therapy applied in the examined group was kriotherapy, which is characterized by very high effectiveness.

The use of protection pads and the warm-up can significantly contribute to limiting the risk of an injury or preventing an accident on a slope.

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