

SKIING INJURIES IN PALANDOKEN SKI CENTER: 156 CASES

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Aim: Skiing is an entertaining winter sport with its known risks. Although the injury rates are relatively low in this sport, they can be seen in 2 to 6 skiers per thousand. We report herein the skiing injuries occurred at Palandoken ski Centre during the last season.

Methods: The patients admitted to our hospital due to injuries secondary to ski sport at the winter season of 2004-2005 were included in the study. Demographic, radiological and laboratory data, the mechanism and localization of the trauma, initial Glasgow Comma Score (GCS) and trauma scores were recorded.

Results: A total of 156 patients injured during skiing admitted to the ER at 2004-2005 winter seasons were taken. A hundred and five patients were male and 51 were female and mean age was 29.3 (8-60). All traumatized patients had special gear for skiing, but only 28 patients used helmets. In 136 cases, the injury was secondary to falling whereas in 20 cases the reason was crashing. Isolated injuries occurred in 145 patients, and multiple injuries in 11. The injuries were mainly minor, and they were mostly at the extremities (109), followed by head and neck (15), thorax (8), abdomen (6) and urinary system (2) injuries. One-hundred and forty patients were managed at the emergency room (ER) ambulatory and 15 were hospitalized at different clinics with several diagnoses. Only one patient died due to traumatic intracerebral bleeding.

Conclusion: In conclusion, injuries due to skiing are relatively rare and usually minor and not life-threatening. Traumas secondary to skiing consist of approximately 2 % of all traumas admitted to the ER yearly. Skiing is an entertaining and healthy sport if it is done appropriately. But the skiing individuals have to be informed about the risks of this sport. To make skiing safer it is essential to train the individuals.

Key words: Skiing injury, trauma

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INTRODUCTION

Trauma which is a worldwide serious health problem is the main reason of deaths in patients aged between 1 and 44 years (1). Traffic accidents, falling from height and blunt or penetrating traumas are the main causes of traumas in our country as in the whole world (1-3). Despite regional variations, sometimes sport injuries can be seen³. Skiing is an entertaining winter sport with its known risks. The risks and characteristics of traumas secondary to skiing are previously described (4, 5). Although the injury rates are relatively low, they can be seen in 2 to 6 skiers per thousand (6). These traumas are usually not serious, but rarely they can be life-threatening (7, 8).

The aim of the study was to investigate the skiing injuries occurred at Palandoken ski centre during the last season (2004-2005).

MATERIALS AND METHODS

The patients admitted to the emergency room (ER) of Ataturk University Research Hospital at the winter season of 2004-2005, due to injuries secondary to skiing were included in the study. All resuscitated patients were managed according to the principles of advanced trauma life care support at the ER. Demographic, radiological and laboratory data were recorded. The mechanism and localization of the trauma, initial Glasgow Comma Score (GCS) and trauma scores were also recorded. Organ injuries due to trauma,

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Table 1. Involved systems by injury

Systems	Head-neck	Thorax	Abdomen	Urinary	Extremities	NPEF
No of Cases	15	8	6	2	109	16

NPEF: Normal physical examination findings

surgical and non-surgical treatments, and morbidity and mortality rates were noted.

RESULTS

A total of 156 patients injured during skiing admitted to the ER at 2004-2005 winter seasons were evaluated. A hundred-five (67.3%) patients were male and 51 were (32.7%) female and mean age was 29.3 (8-60). One hundred and two of the patients were foreigners, mostly Russian.

In 136 cases, the injury was secondary to falling whereas in 20 cases the reason was crashing. From these crashed patients 14 had crashed with another skier, 5 crashed to the barriers and crashed to the column of the lift. Isolated injuries occurred in 145 patients and multiple injuries in 11 (Table 1). Most of the injuries consisted of extremity injuries with the rate of 68%. Sixty-eight patients admitted in January, 58 in February and the others in December, March and April. When evaluated for the skiing experience, 49.4% of the skiers have one year, 30.1% have 2-3 years, 6.4% have 4 years of skiing experience and 14.1% were the first time skiers (Table 2). The traumatized patients had special gear for skiing, but only 28 patients (17.9%) used helmets. These patients had no injury at head and neck. GCS was 15 in all patients except two. The injuries were mainly minor, and the types of injuries are shown in Table 3. From patients with sprains, 22 had wrist sprain, 13 knee sprains and 8 ankle sprains. Fifteen patients with wrist injuries were managed with elastic bandage, 7 received forearm splinting. The patients with knee injuries were treated with Jones bandage and three with elastic

bandage. Two patients underwent therapeutic joint puncture, because of hemarthrosis at the knee. Nine patients had skin and 3 had scalp lacerations. Four patients had anterior dislocation at the glenohumeral joint.

Ninety-eight patients were consulted with other clinics and mostly orthopedician, followed by general surgeons, neurosurgeons and chest surgeons. Fractures occurred in 61 patients, and most of them were at the extremities (Table 4). Nearly all were closed fractures. One patient had fracture and dislocation together related with the elbow joint.

One-hundred-forty patients were managed at the ER and 15 were hospitalized at different clinics with several diagnoses. Among 11 patients with multiple organ injuries, one died. This patient had pelvic fracture and intracerebral bleeding. Among 15 hospitalized patients, 10 were operated due to different reasons. The remaining 5 patients were managed non-operatively (Table 5). Nine of the mentioned patients were hospitalized at the orthopedics clinic, three at the chest surgery and one at the general surgery.

DISCUSSION

Skiing is an entertaining and popular sport with its known risks. Injuries due to skiing are relatively rare, usually minor and not life-threatening. But sometimes multiple injuries including head injuries can be seen and they can even be deadly (9,10)

Traumas secondary to skiing consist of approximately 2 % of all traumas admitted to the ER yearly (4,8). This rate is higher when thought only for the winter season.

Table 2. Number of injuries according to ski equipment and duration

Parameters	Equipment		Skiing duration				
	Ski	snowboard	First	One year	Two years	Three years	≥Four years
	n (%)	n (%)	n(%)	n(%)	n(%)	n(%)	n(%)
Fracture	34 (33.7)	27 (49.1)	7(4.5)	30(19.2)	12(7.7)	5(3.2)	7(4.5)
Contusion	15 (14.9)	5 (9.1)	4(2.6)	9(5.8)	4(2.6)	2(1.3)	1(0.6)
Sprain	27 (26.7)	16 (29.1)		21(13.5)	7(4.5)	4(2.6)	1(0.6)
Dislocation	3 (3.0)	1 (1.8)	---	3(1.9)	---	1(0.6)	---
Laceration	10 (9.9)	2 (3.6)	---	8(5.1)	3(1.9)	1(0.6)	---
Other	12 (11.9)	4 (7.3)	1(0.6)	6(3.8)	6(3.8)	2(1.3)	1(0.6)

Table 3. Type and number of injuries

Type of injury	Fracture	Crash	Sprain	Dislocation	Laceration	Other
(n)	61	20	43	4	12	16
%	39.0	12.8	27.6	2.6	7.7	10.3

Previous studies indicated that from all 1000 skiers every 6 to 7 injured before 1970 and 3 to 6 injured between 1970 and 1983. This rate has dropped to 3.7 between 1982 and 1993 (11,12). The decrease in this rate varies according to the quality of the ski equipment, the skills of the skier and the safety of the ski track. The male/female ratio was 2:1 in our study (12,13). This ratio and age distribution was similar to the previous studies.

It is stated in previous studies that injuries occurred mostly at the upper extremities, and head and neck (4,7,9). In our study 79.5% were extremity and head and neck injuries.

Skiing injuries show variations according to the ski equipment, skills of the skier and severity and localization of the injury related to the trauma pattern. The snowboarder usually falls in an anterior-posterior fashion with fixed feet on the snowboard. Outstretched arms are used to absorb the impact from the fall, causing wrist sprains and fracture injuries. Skiers use the lower extremities to control the ski and thereby stretch the lower extremities. Thus lower extremity injuries are more common in skiers (8,9). We observed the same circumstance in our patients, but snowboarders were usually more seriously injured. Sprains and fractures of the wrist and forearm were most commonly seen in snowboarders. Two patients suffering from vertebral fracture were also injured during snowboarding. Lower extremity injuries occurred usually in skiers, usually tibia and fibular fractures and ankle sprains.

In a study, head and neck injuries were reported to be equally distributed in snowboard and ski users (10). Levy et al. (14) determined 350 head trauma in a study including 1032

skiers and 182 snowboarders. In our study, we determined head and neck injury in 15 cases. Eleven of these patients were skiers, only four were snowboarders. Since snowboard is less frequently used in our region, the frequencies of injuries secondary to snowboarding are relatively less frequently seen. However while the number of injuries secondary to skiing are decreasing snowboarding injuries are increasing as described in previous studies (7,12). This increase indicates the increasing use of snowboard. While its use was 1,3 million in 1998 in USA it increased to 5,6 million in the year 2003 with an increase of 331% (15). Although not in this rate, the use of snowboards is increasing in our country among young adults.

Life-threatening injuries during skiing usually occur by brain injuries caused by head and neck traumas (14,16). In our study, only one patient died due to traumatic intracerebral bleeding.

Many studies recommend use of helmets in order to prevent head injuries in ski (17,18). It is stated in the same studies that helmets prevent head injuries. In our study 28 patients were using helmets. None of them had head and neck injuries, although some of them had serious other injuries. However, in another study, it is stated that helmets are not so useful because they preclude hearing and seeing (18,19). We think that helmets can be used after optimization.

Usually, injuries occur by falling in ski. Injuries secondary to crashing of a skier to other skiers or even to another object (barriers, columns) are rare (4,9,20). Made et al. (20) reported that the cause of injury was falls in 50%, jumps in 31%, collisions in 9%

Table 4. Types and number of fractures

Parameters	Upper extremity fractures						Lower extremity fractures						Other fractures				
	Hu	Ra	Ul	RU	Wr	EL	Fe	Tib	Fi	TF	An	Pel	Cr	Ve	Sc	Cl	Rib
No of cases	5	6	3	7	5	4	1	6	3	7	1	1	2	2	1	4	3
Total (n)	30						18						13				
%	49.2						29.5						21.3				

Hu: humerus, Ra: radius, Ul: ulna, RU: radius-ulna, Wr: wrist, EL: Elbow, Fe: femur, Ti: tibia, Fi: fibula, TF: tibia-fibula, An: Ankle, Pel: pelvis, Cr: Cranium, Ve: vertebra, Sc: scapula, Cl: Clavícula,

Table 5. Types and treatments of injuries

Injury	F e m u r fracture	Tibia fracture	E l b o w fracture	vertebra	Solid organ injury (Liver, kidney)	Cerebral contusion	Rib fracture/ pulmonary c
No of cases	1	4	2	2	1	2	3
Treatment	Opr	Opr	Opr	Opr	Opr	Non-op	Non-op

Opr: operative, Non-op: Non-operative, c:contusion

and unspecified in 10%. The mechanism of the trauma and injury of our patients confirms these findings.

Skiing is an entertaining and healthy sport if it is done appropriately. But the skiing individuals have to be informed about the risks of this sport. To make skiing safer it is essential to train people.

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