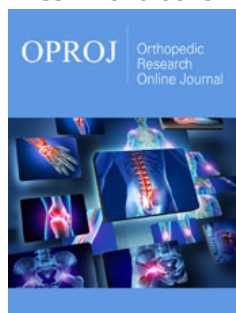


# Therapeutic Expenses, Level of Debility and Duration of Treatment in Patients with Ankle Trauma

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**\*Corresponding author:** Hossein Dinpanah, Department of Emergency Medicine, Torbat Heydariyeh University of Medical Sciences, Iran

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**Ali Vafaei<sup>1</sup> and Hossein Dinpanah<sup>2\*</sup>**

<sup>1</sup>Department of Emergency Medicine, Shohadaye Tajrish Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>2</sup>Department of Emergency Medicine, Torbat Heydariyeh University of Medical Sciences, Iran

## Abstract

**Background:** Ankle trauma is one of the most common musculo-skeletal injuries. The aim of this study was to evaluate the therapeutic expenses, the level of debility and the duration of treatment in patients with ankle trauma.

**Material and methods:** In this descriptive study, the necessary information was obtained from documents of 477 patients with ankle trauma who referred to emergency department of Shohadaye Tajrish, Tehran, Iran. Age, gender, the severity of trauma, the level of debility, expenses and type of insurance supply for each case were recorded.

**Results:** Ankle trauma was fivefold more prevalent in patients above 21 years old with 1.3:1 female/male ratio. According to the severity, the patients were divided into three groups of first grade, second and third grades with 407 subjects (85.32%), 48 subjects (10.06%), and 22 subjects (4.61%), respectively. 225 subjects (47.16%) required to have rest in home for 3 days, 209 persons (43.81%) need to have rest for 3-7 days and 44 persons (9.22%) need to have rest for more than one week. 334 subjects (70.03%) were under insurance coverage and the expenses were including 150 - 300 USD for 254 cases (53.24%), 300-600USD for 129 cases (27.04%), and more than 600 USD for 84 cases (17.61%).

**Conclusion:** Our results demonstrate that ankle trauma results in remarkable debility and poses economical burden on socially active population. Owing to simple mechanism of this type of trauma, it seems to be preventable. More patient education, and immediate and careful ambulation are recommended.

## Introduction

Ankle trauma is one of the most common musculo-skeletal injuries in sport activities and includes 10-15% total sportive injuries [1,2]. Each year, 10,000 persons develop to ankle's sprain which comprises 75% of total foot injuries [3,4]. 15% of ankle injuries are in form of fractures and 85% are inversion associated to external sprain [5,6]. In the sport, the probability of foot sprain is 45% for an athletic, and among them 65% related to ankle sprain and 10-30% related to other ankle injuries [1,2]. The following accidents produce these injuries, direct trauma, rotations and sprains, and overpressure [7]. The causes of injury are direct trauma (in football), strain (in wrestling) and external sprain (in volleyball and basketball) [1,2,8]. Due to pivotal role in physical activity such as running, jumping and bouncing along to sudden variation in direction, ankle exposes to above injuries [9].

With regard to ankle anatomy (strength of deltoid tendon), the internal part of foot is less susceptible, but the external section of foot exposes to more injury due to less ligament support (three anterior, medial and posterior ligaments) and more rotation. Although, there is the less prevalence of the injury in the internal part of foot, but it is associate with more complications and usually it needs surgery [9,10].

Most ankle traumas manifest as swelling, ecchymosis and pain due to tearing the ligament in the area [11]. If these injuries leave out without correct therapy, they result in not only the instable joint but also some sign and symptom such as pain, swelling, dislocation, weakness, and osteoarthritis in joint. In addition, the concurrent disease such as rheumatic arthritis can enhance this situation [1,2,12].

Sometimes, a small strike or strain in athletics cause formation of fibrocartilage tissue as well as joint movement limitation. With consider to professional and nonprofessional exercises in different age groups, various musculo-skeletal injuries and also lack of adequate studies in this field in Iran, so we decide to evaluate ankle injuries that is the one of the most common injury. However, this injury (ankle sprain) considers as sportive trauma, but it spreads in non-sportive activity by ageing. It is appeared that previous sprain can be a susceptible factor for next traumas [13]. In this study, we consider the economic burden of diagnosis and treatment of this trauma, which is much lower than its real economic expenses.

## Material and Methods

We designed descriptive study which has been performed in a six months period in Shohadaye Tajrish hospital, Tehran, Iran, using documented data. This study included 477 patients who referred to emergency department with ankle injury. The method of data collecting was prepared by considering the medical ethics and attending the researcher in file section of hospital as well as extracting the related data according to the checklist. The recorded data were including, Age, gender, the severity of trauma, the level of debility, expenses and type of insurance. At the end, data entry was done by checklist information. SPSS software (ver. 20) was used for data analyses.

## Results

In the mentioned period, 477 subjects were included in our study. 201 cases (42.13%) were male and 276 cases (57.86%) were female. According to life span volubility, the patients were divided in two groups, 79 patients (16.56%) have 1 to 20 years old and 398 cases (83.43%) have more than 21 years old.

According to the severity of the ankle trauma, the patients divided in three groups. First group included 407 subjects (85.32%) with minor injuries (grade I), second group included 48 subjects (10.06%) with moderate injury (grade II) and third group consisted of 22 subjects (4.61%) who have severe injury (grade III).

**Table 1:** The frequency of costs following ankle trauma.

Frequency	Therapeutic Expenses (USD)
254 (53.24%)	150-300
129 (27.04%)	300-600
84 (17.61%)	Over 600

Diagnosis and treatment cost for ankle trauma in the mentioned groups was including, 150-300USD for 254 patients (53.24%), 300-600USD for 129 patients (27.04%), and more than 600 USD for 84 patients (17.61%) cost (Table 1).

## Discussion

In this study, all patients with ankle trauma who referred to hospital in the first half of year 2020 were evaluated. The prevalence of ankle trauma in patients more than 20 years old was more than lower ages (83.43% of clients with this injury were higher than 20 years old and 16.56% were lower than 20 years old). Moreover, the females (57.86%) were more than males (42.13%), probably due to occurrence of menopause and higher incidence of osteoporosis in women and also wearing un-standard shoes.

In terms of severity of trauma, the most prevalent injuries had correlation to the first-grade trauma with prevalence of 85.32%, and the second grade and third grade injuries have prevalence of 10.06% and 4.61%, respectively. Fortunately, the small proportion of these injuries related to severe trauma, and it is obvious that the probability of complications is more in this group.

In terms of the days for rest, 47.16% of studied population need 3 days resting, 43.81% required three to seven days, and 9.22% need more than one week resting. It should be considered that the improvement of patients and their rehabilitation required rest days more than abovementioned statistics and this situation have effects on patients quality of life as well as on their jobs.

70.03% of evaluated people were under coverage of different insurance organizations such as Social Welfare Org. (Tamine Ejtemaei), Therapeutic Services Org.(Khadamate Darmani) and other insurances. The amount of costs that were paid for diagnostic and therapeutic inventions by clients was as follow 53.24%, 21.04% and 17.61% of patients paid between 100.000-200.000 Rls, 200.000 - 500.000 Rls and more than 500.000 Rls, respectively and the last group had not any type of insurance.

It is obvious that these expenses only related to hospital costs and the economical burden due to this trauma, yet the real costs for family and health services include costs of job absence and also costs related to treatment of complications and rehabilitation are more than above mentioned statistics.

## Conclusion

High ratios of ankle traumas are preventable; so, it is essential to not only doing more studies in this field, but also evaluating the different populations. Furthermore, patients with these injuries should complete the follow up; therefore, there will be correct estimation for complications, required time for resting, the imposed economic burden on insurance org. and families as well as better services for patients.

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