

Assessment of patients applying for emergency services with hand injury

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Abstract

Aim: The purpose of this study is to evaluate the data of the patients who applied the emergency department due to the hand injuries.

Material and Methods: This descriptive study used electronic records of our hospital between January 2014 and December 2017. A total of 4706 patients referred to the emergency department of our hospital were enrolled and 592 hand injury patients who were consulted with the Orthopedics and Traumatology Specialist were included in the study. The diagnosis was coded according to ICD-10.

Results: The majority of men (77.7%) were found to have a hand injury. 29.9% of injuries occurred in summer, most frequently in August (11.3%); It was the day (20.9%) that hand injury was seen more on Thursday than other days. More than half of the patients (59.1%) had insurance from Social Security Institutions (SSI). Tendon incisions are often not accompanied by hand fractures (23.1%).

Conclusion: Hand injuries are important because they cause permanent disability. This research points to many important factors for hand injuries. We hope that these demographic data will contribute to reaching different angles to prevent hand injuries by determining the time zone during the year in which our hand injuries are encountered in our region.

Keywords: Hand; Emergency; Injury; Tendon; Avulsion.

INTRODUCTION

Injuries accounted for 9% of all deaths according to 2000 World Health Organization Report (1). Annually, 5.200.000 deaths occur due to injuries (2). Hand injuries account for 6.6-28.6% of all injuries. Hand injury comprises a remarkable proportion of patients presented to emergency departments, which requires surgical repair in most cases. In particular, it is frequently encountered in regions where small and middle industrial and agricultural enterprises are common (3). Due to its functional importance, hand injuries are associated with high morbidity and prolonged labor loss (4-6). It is important to obtain data about interventions directed to injuries which causes significant labor loss and economic burden in the community in order to take measures regarding safety, equipment, and education by identifying etiological factors. In addition, risk estimation can be performed by analyzing related lines of work and working conditions in these lines of work.

The aim of present study was to perform a retrospective

analysis of patients presented to our emergency department with a hand injury in our region which is an important industry and agriculture center and to shed light on attempts aiming to prevent these injuries.

MATERIAL and METHODS

We reviewed data from 4.706 patients, who presented to the emergency department with a hand injuries and underwent intervention for a cut after consultation with an orthopedics and traumatology specialist between January 2014 and December 2017. All data were extracted from the electronic database. Diagnostic data were coded according to ICD-10. The patients with diagnoses such as fracture, tendon injury or sutured cut and available tests were included in the study. Exclusion criteria were the referral to another facility following traffic accident or insufficient data in the database.

In 592 patients meeting inclusion criteria, age, gender, date of injury (day and month), time at arrival to the emergency

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department, insurance and additional injuries (injuries involving nail, flexor and extensor tendon injury, fracture) were recorded. Times at arrival were classified into 3 categories (eight hours in each). The age was classified by decade.

This retrospective study was approved by the Ethics Committee of Erciyes University (approval#2018/284). No informed consent was obtained according to ethics approval. The study was conducted in accordance with the Helsinki Declaration.

All data were analyzed by SPSS for Windows version 15.0 (SPSS Inc., Chicago, IL, USA). Numeric variables are summarized as mean \pm standard deviation while categorical variables are summarized as count and percent.

RESULTS

Of the patients, 132 (%22.3) were women and 460 (77.7%) were men. Mean age was 34.4 years, ranging from 1 to 95 years. Hand injury was most commonly observed at 10-19 years of age among women (4.1%) while at 20-29 years of age among men (14.2%) (Table 1).

The hand injuries most commonly occurred in August among months of years (n=67; %11; Table 2) whereas in summer (n=177 cases) among seasons and in Thursday (20.9%) and Monday (19.6%) among days of the week (Table 3). In addition, they mostly occurred during daytime (08:00-16:00 [57.3%]; Table 4).

When insurance was assessed, it was seen that 350 patients (59.1%) received reimbursement from Social Security Institution (SSI), 93 patients (15.7%) from Bağ-Kur and 73 patients (12.3%) from Green Health Card (Table 5).

Hand injuries occurred due to work accident in 203 patients (34.7%). There was a concurrent metacarpal/phalangeal fracture in 137 patients (23.1%) whereas flexor tendon injury in 4.1%, extensor tendon injury in 8.1% and multiple-tendon injury in 2.7% of patients. In addition, the rate of cut at nail level, pulp defect or subtotal or total amputation was 35.8% (Table 6).

Table 1. Age and sex distribution of patients

Age Group	Sex		Total n (%)
	Woman n (%)	Man n (%)	
0-9	23 (3.9)	49 (8.3)	72 (12.2)
10-19	24 (4.1)	73 (12.3)	97 (16.4)
20-29	13 (2.2)	84 (14.2)	97 (16.4)
30-39	13 (2.2)	76 (12.8)	89 (15)
40-49	18 (3)	62 (10.5)	80 (13.5)
50-59	14 (2.4)	47 (7.9)	61 (10.3)
60-69	13 (2.2)	48 (8.1)	61 (10.3)
70-79	9 (1.5)	13 (2.2)	22 (3.7)
80+	5 (0.8)	8 (1.4)	13 (2.2)
Total	132 (22.3)	460 (77.7)	592 (100)

Table 2. Distribution of months and seasons of injuries

Month	Case n (%)	Season
December	44 (7.4)	Winter 107 (18.1)
January	31 (5.2)	
February	32 (5.4)	
March	40 (6.8)	Spring 157 (26.5)
April	60 (10.1)	
May	57 (9.6)	
June	48 (8.1)	Summer 177 (29.9)
July	62 (10.5)	
August	67 (11.3)	
September	50 (8.5)	Autumn 151 (25.5)
October	48 (8.1)	
November	53 (9)	
TOTAL	592 (100)	592 (100)

Table 3. Distribution of the days of injury

DAY	Case n (%)
Monday	116 (19.6)
Tuesday	93 (15.7)
Wed-nesday	98 (16.6)
Thursday	124 (20.9)
Friday	99 (16.7)
Saturday	35 (5.9)
Sunday	27 (4.6)

Table 4. Distribution of time zone where injury occurred

TIME ZONE	Case n (%)
00:00-08:00	56 (9.7)
08:00-16:00	339 (57.3)
16:00-24:00	197 (33.3)

Table 5. Medical institutions of patients

INSTITUTION	Case n (%)
SSI	350 (59.1)
Bağ-Kur	93 (15.7)
Green Health Card	73 (12.3)
Optional Insurance	33 (5.6)
Pension Fund	27 (4.6)
Non-Authority	10 (1.7)

Table 6. Distribution of injuries accompanying the incisions

ACCOMPANIED TO THE INJURY	Case n (%)
From Nail Level	212 (35.8)
Flexor Tendon	24 (4.1)
Extensor Tendon	48 (8.1)
Multiple Tendons	16 (2.7)
Fracture	137 (23.1)
Total or Subtotal Amputation	9 (1.5)

DISCUSSION

The hand injury is an important trauma which is associated with a high morbidity rate due to functional significance and comprises a frequent cause of emergency department visits (5). Annually, about one million patients present to the emergency department with hand injury according to American National Trauma Surveillance System data (7).

It is well-known that there is a marked male preponderance among patients treated for a hand injury. It could be suggested that this may be due to the fact that risky jobs with the potential to cause injury are mainly being done by men (8). In previous studies, it was reported that the proportion of men was 57-80% while the proportion of women was 20-43% among patients with hand injury (9,10). Similar proportions were found in our county with 70-87.3% for men and 12.7-30% for women (5,10). In our study, the proportions of men and women were found as 77.7% and 22.3% among patients with the hand injury, respectively.

Gupta et al. reported that hand injury was most commonly seen at 21-50 years of age by 50% (11). In our country, it was reported as 21-30 years of age (5,10). In our study, hand injuries most commonly occurred before 20 years of age (35.9%) in women while at 10-39 years of age in men (50.6%). In our study, it was seen that hand injury incidence was not low among children aged <10 years and even it was parallel to other age groups in agreement with literature. In our clinical experience, we can suggest that this is due to compression of fingers at the door. In our study, the mean age was 34.2 years which is comparable to the mean age (34.2 years) reported by Şakrak et al. (5).

The rate of hand injury during work is rather high and the incidence of work accident is particularly higher among regions where industrial facilities are common (12). In the study on work accidents, Yılmaz et al. reported that the most important causes of work accidents were unsafe acts and unsafe conditions (13). In the studies by Karasoy et al. (14), Şakrak et al. (5), Bozkurt et al. (8) and Dağlı et al. (15), it was reported that hand injuries occurred due to work accident by 40%, 32.8%, 50% and 39.9%, respectively.

As hand injuries are caused by various mechanisms, comorbid injuries such as metacarpal/phalangeal fractures, flexor and extensor tendon cuts, injuries at nail bed, or total or subtotal amputations develop secondary to injury. In the study by Oğuz et al., it was reported that fractures accompanied to hand injury in 26.4% and tendon injury in 34.0% of patients (15). Şakrak et al. reported that fractures accompanied to hand injury in 11.5%, tendon injury in 35.3% and amputation in 18.2% of patients (5). Again, Bozkurt et al. reported that fractures accompanied to hand injury in 21.9% of patients. In our study, there was a comorbid fracture in 23.1%, flexor tendon injury in 4.1%, extensor tendon injury in 8.1% and multiple-tendon injury in 2.7% of patients while there was cut at nail level, pulp defect, subtotal or total amputation in 35.8% of patients.

Although rates in our study are in agreement with the literature, we think that the differences are due to regional variability in conditions.

Due to hand injuries are mostly caused by occupational accidents, the majority of patients are SSI. We believe that the rates of green health card and pension fund are related to house accidents of housewives and retirees. In addition, we can assume that the rate of being insured in our country is quite sufficient and Turkish citizens can easily benefit from health services.

When date of injury was assessed, the distribution across months of year was almost equal. However, hand injuries most commonly occurred in August by 67 cases (11.3%) and during summer by 177 cases. The distribution of cases showed differences when considered according to days of month. It was seen that number of patients was remarkably decreased at weekend. During week days, hand injuries most frequently occurred in Thursday (20.9%) and Monday (19.6%). It may be suggested that higher incidence can be due to fact that people work more actively during summer and spend more time at outdoor. It might be assumed that individuals are inattentive in Monday in order to finish works in the first day of week.

Similarly, accident rate was markedly high during daytime when compared to night time. The hand injuries most frequently occurred between 08:00 and 16:00. This finding is in agreement with literature.

CONCLUSION

Hand injuries are important because they cause permanent disability. In our region, number of patients presented to emergency department with hand injury is rather high. Hand injuries more frequently occur at summer; during week days, particularly in Monday and Thursday; at daytime; and in men aged 20-50 years. Complicated traumas such as fracture, tendon injury and amputations can accompany to hand injury. Hand injuries can be avoided by taking appropriate measures by community and employers in the light of demographic data provided in our study.

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