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ORIGINAL RESEARCH

Clinical and Demographic Characteristics of Patients Presenting to the Emergency Department with Isolated Hand and Wrist Injury

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Abstract

Background: *Upper extremity travma are common cases which apply emergency department and particularly hand and wrist mostly effected. After patients apply emergency departments for such as injuries and because of that their daily activities affected. Our objective is to reveal in detail the aetiologies, demographic characteristics, clinical findings and results of patients, who are admitted to our emergency service with the complaint of hand and wrist trauma.*
Methods *In this study, records of hospitalized patients at ortopedics and traumatology service and plastic and reconstructive surgery services and the emergency services files of the patients who are admitted because of hand and wrist trauma to Dicle University, Faculty of Medicine, Emergency Department between 1 January 2014-31. December 2014 were reviewed. Clinical and demographic characteristics of the patients were retrospectively also operational requirements and results had studied Ethical approval was obtained for this study.*
Results: *In a 12 month study period a total of 600 patients were included. Patients with additional organ injury, major trauma were excluded from study. Isolated hand and wrist trauma, 474 cases were investigated. 128 were male, 346 female cases. The average age of our patients was 21.8 ± 17.8. The mean age of 22.6 ± 16.6, while men's average age of women was 19.5 ± 20.5*
Conclusion: *Consequently, a major part of the patients that admitted to emergency department with a hand injury was consisted of working, young men. Majority of the injuries observed in the patients examined were the injuries due to inadvertency and lack of education, which can be prevented by taking simple but necessary measures and by disseminating the vocational training programs.*
Key Words: *Hand trauma, emergency departments, demographic characteristics, work accident.*

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Introduction

Upper extremity traumas are observed broadly in trauma cases that are admitted to emergency department, and hands and wrists are the parts of the body that are affected frequently. These types of injuries constitute 10-30% of the cases that are admitted to the emergency (1, 2). Male patients aged between 15 and 30 years are generally admitted to the emergency department, and the quality of the daily life of patients are affected dramatically after such injury (3). Also, these cases may rarely be accompanied by other system traumas (3,4).

Injuries are observed frequently particularly in workplace environments, where occupational safety measures are insufficient (5-9). Approximately half of hand injuries source from occupational accidents according to the data from 50 years ago (10). Furthermore, in new publications, it is reported that 1/3 of hand injuries take place at home, and that 1/3 of the same take place during activities other than work (11). The ratio of hand traumas increase gradually in connection with industrial development, and they bring great economic burden, as well as critical social, functional and labour loss (12,13).

Certain challenges are observed in developing countries during implementation of rules related with occupational health, and sufficient numbers of measures are not taken in relation with occupational health and safety in most of industrial areas. Studies, which are related with the occurrence form of hand traumas and their epidemiology, are limited in our country. Life style, social characteristics and working conditions of societies may affect the distribution and severity of such traumas. Therefore, basic occurrence characteristics and epidemiology of hand traumas must be analysed in order to make maximum amount of functional improvement and to avoid negative socio-economic affects, and necessary preparations must be made in terms of making early accurate diagnosis and planning of treatment in the light of obtained data.

Our objective is to reveal in detail the aetiologies, demographic characteristics, clinical findings and results of patients, who are admitted to our emergency department with the complaint of hand and wrist trauma, and thus, to prevent any preventable impairment that may emerge in the future, to decrease treatment costs, to shorten duration of treatment, and to prevent unnecessary operations that are repeated.

Materials and Methods

In this study, emergency records of the cases, who are admitted to the Emergency Service unit of the Medical Faculty Hospital of Dicle University, and files of cases, who are hospitalized and treated in the Orthopedy and Traumatology service and Plastic and Reconstructive Surgery service between January 1, 2014 and December 31, 2014, are searched. Clinical and demographic characteristics and also, operation requirements and results of cases are examined retrospectively. Ethical approval was obtained for this study.

Names and emergency department polyclinic protocols of the patients, who are admitted due to hand and wrist injuries, are obtained initially by searching emergency polyclinic book. Emergency department patient examination cards are obtained from the archive by using these names and protocol numbers, and suitable patients are included to the study. Following information is recorded to the forms that are prepared separately for each patient by using the information available in patient examination cards; age, sex, location where trauma took place (home, school, workplace and other); address of the trauma (Diyarbakır Centre, upstate Diyarbakır, places out of province limits); areas of injury (Right d1, right d2, right d3, right d4, right d5, left d1, left d2, left d3, left d4, left d5, palm, dorsum of the hand, wrist); type of injury (complex injury, isolated cut flexor tendon, isolated cut extensor tendon, amputation and superficial cuts); flexor zones and extensor zones; form of injury (punching a window, getting injured by using a spiral, agricultural machine, saw, and getting injured as a result of a traffic accident, firearm injuries, avulsion injuries, suicide-related injuries,

knife injuries, being jammed in the door and other); and form of treatment (primary closure, tendon repair, stump, revascularization, graft, flap, tendonoplasty, replantation and nerve repair).
Results are provided as mean+SD in statistical analysis. Regarding univarite statistical analyses, chi-square test is used for categorical variables, and student-t test is used for continuous variables. The value of p<0,05 is considered as significant statistically.

Table 1: Distribution of our patients by area of residence and venue where the incident took place

Age group	**Male [n (%)]**	**Female [n (%)]**	**Total [n (%)]**	**P**
	346 (73)	**128 (27)**	**474 (100)**	
≤ 15	140 (40.5)	74 (57.8)	214 (45.1)	**0.001**
16 - 59	193 (55.8)	46 (35.9)	239 (50.4)	< **0.001**
≥ 60	13 (3.7)	8 (6.3)	21 (4.5)	**0.016**
Venue				
Home	189 (54.6)	117 (91.4)	306 (64.6)	< **0.001**
School	14 (4.0)	2 (1.6)	16 (3.4)	**0.256**
Workplace	47 (13.6)	3 (2.3)	50 (10.5)	< **0.001**
Other*	96 (27.8)	6 (4.7)	102 (21.5)	< **0.001**
Area of residence				
Diyarbakır Centre	203 (58.7)	91 (71.1)	294 (62.0)	**0.014**
Upstate Diyarbakır **Out of Diyarbakır**	104 (30.1)	34 (26.6)	138 (29.1)	**0.427**
	39 (11.2)	3 (2.3)	42 (8.9)	**0.008**

Other*: Street, garden, park, café and etc.

Results

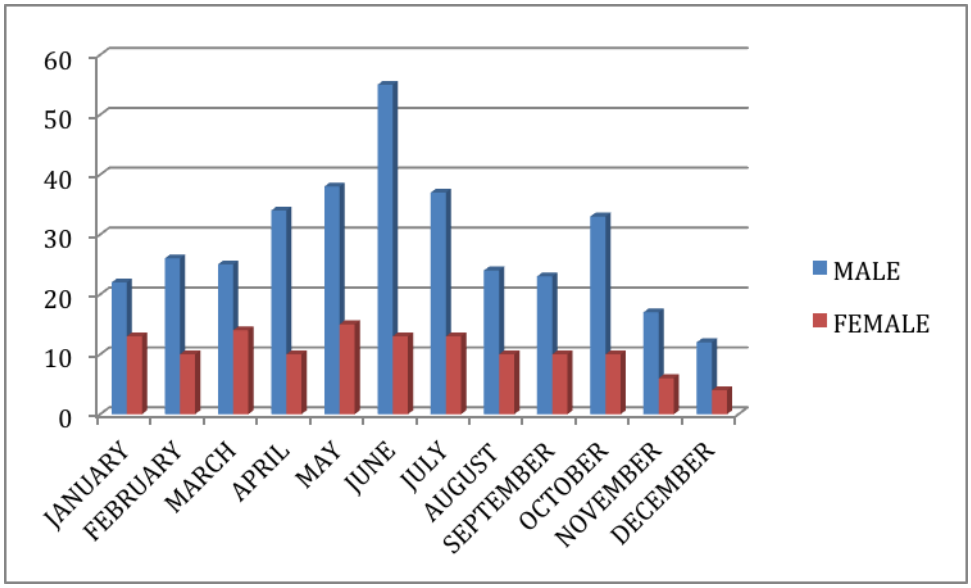
Total 600 patients are included to the study in total during a period of 12 months. Total of 474 patients are included to the study, i.e. 346 male and 128 female. Average age of our patients was 21.8±17.8. Average age of males was 22.6±16.6 and average age of women was 19.5±20.5, and there was no significant difference statistically between sexes in terms of age averages (p = 0.088). The ratio of male patients increased significantly in patients aged between 16 and 59 years (p = 0,001). When we make a comparison between gender and venue where trauma took place, we saw

that males are prominently dominant in the injuries that took place particularly in homes, workplaces and other* venues (p<0,0001) (Table 1).

Distribution of our patients by months

June is the month when the largest numbers of admissions were made with 68 patients, i.e. 55 male patients and 13 female patients. December is the month when least number of admissions was made with 16 patients. A group of patients that included 12 male patients and 4 women patients was constituted. June is the month when the largest numbers of admissions were made by male patients when we consider sex, 55 male patients were admitted, and May is the month when the largest numbers of admissions were made by female patients when we consider sex, i.e. 15 female patients were admitted.

Graphic 1. Graphic, which shows the distribution of our patients by months



Distribution of our patients by the area of hand that is injured

In our patients, the area that was subjected to trauma the most was the 2. finger of right hand with the ratio of 15.8%. In our patients, the area that was subjected to trauma the least was the dorsum of the hand with the ratio of 3%, and the number of males is dominant when we consider the number of admissions made in connection with injuries (p = 0.015) (Table 2).

Table 2: Distribution of our patients by the area of hand that is injured

Injured area	Male[n (%)]	Female[n (%)]	Total [n (%)]	P
	346 (73)	128 (27)	474 (100)	
Right 1. finger	41 (11.8)	13 (10.2)	54 (11.4)	0.745
Right 2. finger	63 (18.2)	12 (9.4)	75 (15.8)	0.023
Right 3. finger	56 (16.2)	12 (9.4)	68 (14.3)	0.076
Right 4. finger	48 (13.9)	6 (4.7)	54(11.4)	0.005
Right 5. finger	39 (11.3)	9 (7.0)	48 (10.1)	0.230
Left 1. finger	35 (10.1)	22 (17.2)	57 (12.0)	0.040
Left 2. finger	32 (9.2)	19 (14.8)	51 (10.8)	0.095
Left 3. finger	32 (9.2)	14 (10.9)	46 (9.7)	0.601
Left 4. finger	30 (8.7)	18 (14.1)	48 (10.1)	0.089
Left 5. finger	13 (3.8)	10 (7.8)	23 (4.9)	0.090
Wrist	22 (6.4)	6 (4.7)	28 (5.9)	0.661
Dorsum of the hand	14 (4.0)	0 (0)	14 (3.0)	0.015
Palm	13 (3.8)	7 (5.5)	20 (4.2)	0.442

Distribution of our patients by type of injury

As we assess our patients by type of injury, we observed that the most frequently observed type of injury was amputation (nail bed repair is also considered under the heading of amputation) with 174 patients (36.7%). The most frequently observed type of injury in isolated form was Flexor Tendon Cuts with 63 patients (13.3%). 42 patients (8.9%) were given medical treatment due to Extensor Tendon Cut (Table 3).

Table 3: Distribution of our patients by type of injury

	Male [n (%)]	Female [n (%)]	Total [n (%)]	
Severity of injury	**346 (73)**	**128 (27)**	**474 (100)**	**P**
Complex Injury*	**46 (13.3)**	**8 (6.2)**	**54 (11.4)**	**0.034**
Isolated Flexor Tendon	**51 (14.7)**	**12 (9.4)**	**63 (13.3)**	**0.169**
Isolated Extensor Tendon	**35 (10.1)**	**7 (5.5)**	**42 (8.9)**	**0.145**
Amputation*	**124 (35.8)**	**50 (39.1)**	**174(36.7)**	**0.522**
Other**	**96 (26.1)**	**51 (39.8)**	**147 (29.7)**	**0.060**

Amputation*: Nail bed repair is also considered under the heading of amputation.

Other: Superficial cuts etc.**

Distribution of our patients by zone of injury

In our patients, most frequently observed flexor zone injury was in zone 1 with 127 patients (26.8%). Males were significantly dominant in terms of admissions made in connection with flexor zone1 injury ($p = 0.014$). In our patients, least frequently observed flexor zone injury was zone 4 injury with 7 (1.5%) patients. In our patients, most frequently observed extensor zone injury was zone 1 injury with 170 patients (35.9%). Furthermore, there were 33 extensor zone 3 injuries, and the number of males was significantly dominant in the number of admissions made with the complaint of Extensor Zone 3 injury ($p = 0.022$). In our patients, least frequently observed extensor zone injury was zone 7 injury with 4 patients (0.8%) (Table 4).

Distribution of our patients by injury mechanisms

As we consider aetiological factors, hand injury as a result of being jammed in the door was listed at the top of the list with 128 patients (27%). As we made a comparison between sexes on the basis of reasons for trauma, males were significantly dominant in terms of injuries that are related with spiral cuts ($p = 0.014$) and being jammed in the door ($p = 0.001$), and we did not observe any significant difference between sexes in terms of injuries that are related with punching a window and knife cuts (Table 5).

Table 4: Distribution of our patients by zone of injury

		Male [n (%)]	Female [n (%)]	Total [n (%)]	
	Zone	**346 (73)**	**128 (27)**	**474 (100)**	**P**
Ekstensor zone	Zone 1	82 (23.7)	45 (35.2)	127 (26.8)	**0.014**
	Zone 2	71 (20.5)	24 (18.8)	95 (20.0)	**0.625**
	Zone 3	27 (7.8)	12 (9.4)	39 (8.2)	**0.574**
	Zone 4	5 (1.4)	2 (1.6)	7(1.5)	**1.000**
	Zone 5	20 (5.8)	6 (4.7)	26 (5.5)	**0.821**
Flexsor zone	Zone 1	125 (36.1)	45 (35.2)	170 (35.9)	**0.914**
	Zone 2	36 (10.5)	6 (4.7)	42 (8.9)	**0.067**
	Zone 3	29 (8.4)	3 (2.3)	32 (6.8)	**0.022**
	Zone 4	9 (2.6)	1 (0.8)	10 (2.1)	**0.300**
	Zone 5	6 (1.7)	1 (0.8)	7 (1.5)	**0.680**
	Zone 6	14 (4.0)	2 (1.6)	16 (3.4)	**0.256**
	Zone 7	**3 (0.9)**	**1 (0.8)**	**4 (0.8)**	**1.000**

Distribution of our patients by type of treatment applied

As we assess the treatment methods applied on patients; we observed that 153 patients (32.3%) were subjected to flexor and/or extensor tendon repair. The number of male patients is significantly dominant in patients, who are subjected to tendon repair ($p<0.001$).

Table 5: Distribution of our patients by injury mechanisms

Injury mechanism	Male [n (%)]	Female [n (%)]	Total[n (%)]	P
	346 (73)	128 (27)	474 (100)	
Punching a window	25 (7.2)	5 (3.9)	30 (6.3)	0.210
Spiral Cuts	26 (7.5)	2 (1.6)	28 (5.9)	0.014
Agricultural Machinery Injuries	7 (2.0)	1 (0.8)	8 (1.7)	0.689
Hand Caught by Saw	5 (1.4)	0 (0.00)	5(1.1)	0.330
Traffic Accidents	2 (0.6)	0 (0.00)	2 (0.4)	1.000
Ring Avulsion	1 (0.3)	0 (0.00)	1 (0.2)	1.000
Knife injuries	69 (19.9)	22 (17.2)	91 (19.2)	0.599
Being jammed in the door	79 (22.8)	49 (38.3)	128 (27.0)	0.001
Other Causes*	132 (38.3)	49 (38.3)	181 (38.2)	0.915

Other Causes*: Smashing by stone, injuries caused by explosives held in hands, sports injuries etc.

Table 6: Distribution of our patients by type of treatment applied: Type of Treatment

Treatment Modality	**Male [n (%)]**	**Female [n (%)]**	**Total [n (%)]**	**P**
	346 (73)	**128 (27)**	**474 (100)**	
Primary Repair	112 (32.4)	54 (42.2)	166 (35.0)	0.051
Tendonoplasty	128 (37.0)	25 (19.5)	153 (32.3)	< 0.001
Stump Repair	141 (40.8)	51 (39.8)	192 (40.5)	0.916
Revascularization	6 (1.7)	1 (0.8)	7 (1.5)	0.680
Grafting	0 (0.00)	1 (0.8)	1 (0.2)	0.270
Flap Application	19 (5.5)	6 (4.7)	25 (5.3)	0.821
Reimplantation	7 (2.0)	3 (2.3)	10 (2.1)	0.734
Nerve Repair	15 (4.3)	3 (2.3)	18 (3.8)	0.422

Discussion

Today, approximately 10-30% of injuries that are admitted to the emergency department are comprised of finger and hand injuries. This ratio is approximately 26% (14,15) in our country. Hand injuries are very frequently observed traumas that maintain its importance at all times due to critical morbidity ratios. In American National Trauma Surveillance System, it is stated that approximately one million persons are admitted to emergency department due to hand injuries (16, 17). Furthermore, Trybus et. al. stated in a series they published, that hand injuries constitute a certain ratio of entire injuries, a ratio that ranges between 6,6% and 28,6%, and that hand injuries constitute approximately 28% of the traumas related with muscle-skeleton system (18). High ratio of hand injury cases that are admitted to the emergency department increases the workload of emergency department. Since hand trauma particularly affects working population, we may emphasize a critical cost and labour loss in consideration of treatment and rehabilitation expenses. Most of the injuries that are observed in examined cases source from carelessness and lack of education. These injuries may be prevented by taking necessary simple measures and by spreading vocational training programs. Thus, a critical decrease may be made in labour loss and health expenses. Significant high number of males among patients, who are given medical treatment due to hand injury, is a common situation, and it is mostly observed in the age group of working adults-young adults. In our study, most critical aetiological reason for hand injuries was comprised of injuries that occur as a result of being jammed in doors due to carelessness.

In a study made by Alderman et. al. (16) and that covered 50272 patients, who were admitted to 5 different emergency centres in a period of 2 years, it is stated that 28.6% of all of the injuries were comprised of hand and wrist injuries, but it is also stated that when wrist fractures are excluded, this ratio dropped to 25.7%, and that its ratio among all of the patients, who were admitted to emergency department, was 15.8%. In the study, affects that hand injuries make on the economy of the country were searched. The result was striking. The total amount of the burden caused only in one year by 2632 patients, who were admitted to Michigan University, United States of America, was 2.420.899 United States Dollars. We may say that it is much more critical than treatment stage to prevent hand traumas that require such high amount of treatment expenses. Main objective must be to prevent occupational and home accidents. In subject research, operation expenses constitute 80% of total expenditure. This issue emphasizes the importance of preventive services. The study made jointly by Dias and Elias (19) revealed that the treatment of patients admitted to the hospital with hand trauma is one of the quite expensive treatments. In the aforementioned study, it was determined that only treatment costs of patients treated were 100 million British Pounds. Unless patients, who are admitted with hand trauma, are treated neatly, such situation may cause permanent disability and labour loss. Most of these injuries occur as a result of occupational accidents, home accidents, being jammed in the door, traffic accidents and firearm injuries. Types of injuries, types and frequency of admission to emergency department and determination of the nature of first responses made are very critical since it is essential to regain former functions of such a vital organ. Such types of epidemiological studies play a critical role in repair of errors that were made and that currently continue to be made. In this study, it is aimed to search the types and admission forms of hand and wrist injuries that are admitted to emergency department, and to decrease the intensity of first response made in emergency department and to decrease labour loss.

Most of the patients are male patients aged between 10 and 30 years regardless of the type of tissue injured (1,21). Rosberg et. al. determined the ratio of male/female approximately as 2/1 in their series that included 2188 patients and they also determined average age as 39 (22). Larsen stated that incidence is more in males, and that it increases with age in women (21). In our study, patients aged between 16 and 59 years are the largest group of patients consistent with literatures. Male

patients constitute a large part of the patients in this group. Approximately one fourth of the patients are calculated as woman.

In our country, frequency of occupational accidents seems to remain at a high level, in spite of the trainings provided and preventive actions taken in relation with occupational health (23). In developing and developed countries, several problems are experienced in implementation of occupational health rules and sufficient amount of emphasis is not laid on this issue in most of industrial sectors (18, 22, 23). In the studies made 50 years ago, the ratio of occupational accidents related with such types of injuries were reported to constitute approximately 50% of patients (10), this ratio was given as 14-44% in various studies that were made recently (19, 23). Young males constitute a great majority of injured patients (16-22). Although the ratio of occupational accidents is relatively lower than other injury mechanisms, these are more severe injuries (1, 11). In a study made by Rosberg et. al., it was stated that 69% of the patients, who were admitted due to occupational accidents, were hospitalized to a hospital and treated (1). In the study made by Ünlü et. al., it was stated that 87% of the patients were male, that most frequently affected tissue was tendons and that largest numbers of injuries were observed in agriculture sector (23). Basic skin cuts/lacerations, fractures and amputations are observed the most as a result of injuries that are related with occupational accidents (21-23). Trybus et. al. reported higher ratio of combined tissue injuries and amputation (18). Fingers were reported as the zone that is subjected to injury most frequently (2, 15, 23). In a study made by Ünlü et. al., carelessness was reported as the most frequently observed factor that sets the ground for injury (23). Frequency of such injuries is higher in industrial sectors and agriculture sector, where works are performed manually (1). In our study, there were 50 patients (10.7%), who were admitted with occupational accident, and 47 of these patients were male and 3 of them were female. Complex type injuries (tendon cuts and bone fractures) and amputations were the most frequently observed injuries in occupational accidents, and zones that were subjected to injuries most frequently were fingers. Most of the patients, who were admitted due to occupational accidents, were hospitalized. Most of the patients, who had undergone an operation, were subjected to occupational accidents. This issue shows us that the occupational accidents mainly result in severe injuries, although its ratio is not very high in comparison to any other causes of injury. There are distinctive inaccurate practices in relation with referral of patients to hospital. Troubles that are caused by occupational accidents may be eliminated to a large extent by making necessary legal regulations and by laying necessary emphasis on training of workers. Providing information to on-site doctors and particularly the personnel, who are responsible for the health of workers, on accidents, first aid and transport are also very critical in terms of morbidity.

In the study made by Ünlü et. al. (23), it was observed that the most frequently injured finger was the right 4. finger with the ratio of 26.78%, and that the least injured finger was the left 5. finger with the ratio of 11.33%. In our study, most frequently injured finger is the right hand 2. finger with the ratio of 15.8%; least injured finger is the 5. finger of left hand, and we determined palm injuries in 4.2% of the patients, and we also determined injury on the dorsum of the hands of 3.0% of the patients. Results of the study are diversified, and a generalization may not be made.

Types of injuries observed in patients, who were admitted to emergency department with hand trauma, were examined. Accordingly, classification is made as below; superficial, tissue defect, tendon damage, nerve cut, complex injuries (fracture and dislocation) and amputation (nail bed revision, subtotal amputation and total amputation). Most frequently observed injury type was superficial injuries with the ratio of 36.7%. Complex injuries constituted 11.4% of such injuries. In the study made by Karasoy et. al. (14), more than 1/3 of the cases were comprised of isolated skin cuts, and isolated tendon cuts were listed in the second place. In our study, contrary to the literature, isolated extensor tendon damage was the least observed injury type with the ratio of 8.9%. As we examine amputations in patients with hand and wrist traumas, amputation ratio was reported as

5.9% in the data provided by Ünlü et. al. (23). According to the data in our study, ratio of amputation in patients, who were admitted to the emergency department with hand injury, was determined as 36.7%. A very high ratio was observed when we make a comparison with the literature.

One of the most frequently performed procedure that was implemented on patients, who were admitted to the emergency department with hand and wrist trauma, was primary saturation with the ratio of 35.0%. When we consider that most of the injuries were superficial injuries, it is normal that the treatment method, which was used most frequently, was primary saturation. Stump repair was made on 40.5% of our patients. As we stated above, the ratio of finger amputation was determined as 36.7% in our study. If we consider that the total amputation ratio was 36.7%, we may say that the reason for implementation of stump repair procedure in the ratio of 40.5%, which is higher than the ratio of amputation, is that there were amputations among patients, who were admitted with complex injuries, that they were not assessed within the framework of isolated amputation, that the patients, who were subjected to nail bed revision, were assessed within the framework of stump repair and were not determined in detail. We may also list the following among the reasons stump repair procedure was performed in such a high ratio; injuries were particularly related with finger distal and circulation did not allow reimplantation that much, relative injury was sourced from jamming forces in cases, who were subjected to amputation, and amputation was not delivered under suitable conditions or was not available at all, hand surgery doctor, who gave reimplantation decision in emergency department, was subjective at times in presentation of cases to the relative specialist.

Indeed, training is the step that must be primarily considered in prevention of occupational accidents. A significant decrease may be made in the frequency of occupational hand injuries by taking and implementing certain basic safety measures in industrial machines and by using mechanical systems during handling of heavy loads. Functional and monetary loss that is caused by occupational accidents may be eliminated to a large extent, in case necessary legal regulations are made on this issue, in case problems that are faced in practice are removed, in case necessary level of emphasis on training workers and in case sufficient level of health organization is made. Providing information to on-site doctors and particularly the personnel, who are responsible for the health of workers, on accidents, first aid and transport are also very critical in terms of morbidity. Epidemiology is the key component of injury control. Data that are obtained as a result of epidemiological researches are very beneficial in planning of measures that shall be taken in injury control and selection of strategies suitable for current situation. It is also critical for ensuring that health institutions are prepared for early diagnosis and treatment. Economic dimension of such types of injuries may not be disregarded.

It is extremely important to minimize the ratio of occupational accidents, which are indicated frequently in our study and in the data available in literature. It is obvious that training is the first step in prevention of occupational accidents in our country. Below are the factors that lay the groundwork for trauma; non-provision of suitable working conditions on sectorial basis, establishment of safety conditions inadequately and monetary concerns taking precedence over occupational health, while carelessness, hastiness and imprudence remain as main factors. The number of on-the-job-trainings must be increased and must be subjected to frequent audits. Very affective results may be obtained in a short period by making coordinated studies. The objective must be to prevent trauma rather than treating it. As we consider the ratio of admissions made to the emergency department with hand trauma, the fact that it is at such a high level, as approximately 26%, indicates that such types of injuries are among the main problems that must be examined more. Although the studies that are made in this area are increased significantly in recent years, we are in need of large-scale and multi-centred studies due to the complexity of biomechanical, behavioural and environmental factors that contribute to occurrence of hand, wrist and forearm

injuries. Labour loss and material losses that are caused by insufficient and inaccurate treatments may be prevented by making arrangements on the organization of emergency department and on all of the steps of health system in line with the data obtained from comprehensive studies.

There is no conflict of interest

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