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THE CLINICAL PROFILE OF OCCUPATIONAL ACCIDENTS ADMITTED TO EMERGENCY DEPARTMENT

Acil Servise Başvuran İş Kazalarinin Klinik Profili

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ABSTRACT

Aim: The aim of this study was to investigate the the sociodemographic features, injury types, injury regions and hospital costs of the patients who admitted to emergency department due to occupational accidents.

Material and Methods: This study includes 659 patiens who applied with occupational accident to emergency department between 1st of April 2014-31st of March 2015. The demographic data of patients with injury, types of injury, mechanisms of injury, trauma scores and hospital costs were investigated.

Results: 96.3% of the cases were male. The most frequent admission was betwen the ages 26-35. The most frequent cause of admission was “fall over something”. Mortality was observed in two of the patients; there were more than one regional injury in both of the patients. The hospitalization rate was 7.1%. There was only simple soft tissue injury in 48.1% of the patients; following with laceration 28.2%. The median ISS score was 1 (range 1-75), NISS score was 1 (range 1-75), RTS score was 7.84 (1.96-7.84). The median of the hospital cost was 27.9$ (range 7.0-4744.2).

Conclusion: Occupational injuries could be reduced by education and precautions against accidents; also the educations have to be repeated regularly according to the danger class of the work.

Keywords: *Occupational, accident, trauma*

ÖZ

Giriş: Bu çalışmanın amacı; acil servise iş kazaları nedeniyle başvuran hastaların sosyodemografik özelliklerini, yaralanma tiplerini, yaralanma bölgelerini ve hastane maliyetlerini araştırmaktır.

Gereç ve Yöntem: Çalışmaya 1 Nisan 2014-31 Mart 2015 tarihleri arasında acil servise iş kazası nedeniyle başvuran 659 hasta dahil edildi. Hastaların demografik verileri, yaralanma tipleri, yaralanma mekanizmaları, travma skorları ve hastane maliyetleri araştırıldı.

Bulgular: Olguların %96.3’ünü erkekler oluşturdu. En sık başvuru 26-35 yaşları arasındaydı. En sık başvuru nedeni birşey üzerine düşme idi. Hastaların ikisinde mortalite görüldü. Her iki olguda da birden fazla vücut bölgesinde yaralanma mevcuttu. Hastaneye yatış oranı %7.1 idi. Hastaların %48.1’inde sadece yumuşak doku yaralanması mevcuttu, bunu %28.2 ile laserasyonlar izledi. Ortalama ISS skoru 1 (1-75), NISS skoru 1 (1-75), RTS skoru 7.84 (1.96-7.84) idi. Ortalama hastane maliyeti 27.9 dolardı (7-4744.2 dolar).

Sonuç: İş kazaları, eğitim ve kazalara karşı alınacak önlemler ile azaltılabilir; ayrıca işin tehlike sınıfına göre eğitimler düzenli olarak tekrarlanmalıdır.

Anahtar Kelimeler: *İş, kaza, travma*

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INTRODUCTION

An accident is described as unintentional events can lead to mortality or morbidity due to negligence, carelessness, imprudence or incompetence in any work. International Labour Organization (ILO) describes the occupational disease as an event which is unexpected and not planned but results with an injury (1). Taking measures to protect occupational diseases is as old as human history. Occupational disease is firstly described by Hippocrates at B.C. 370 explaining the toxic effect of lead; the other important literature knowledge includes the studies of Bernardino Ramazzini (2).

According to Social Security Instutition (SSI) of Turkey, 1444 deaths out of 62903 ocupational diseases in 2010, 1700 deaths out of 69227 ocupational diseases in 2011, 744 deaths out of 74871 ocupational diseases in 2012 and 1360 deaths out of 191389 occupational diseases in 2013; additionally there are many morbidities due to occupational disesases (3,4,5,6).

In this study, we investigated the sociodemographic features, injury type, injury region, hospital cost, Injury Severity Score (ISS) (7), New Injury Severity Score (NISS) (8) and Revised Trauma Score (RTS) in patients admitted to emergency department because of occupational diasese.

MATERIAL and METHOD

This study is performed after local ethical approvement in a tertiary care hospital emergency department. The patients admitted to emergency department with occupational accident and equal or over 18 years of age are included the study. There were 659 patients taht are included the study. The sociodemographic features, injury type, injury region, hospital cost, ISS, NISS and RTS are recorded from the hospital records.

All statistical analyses were calculated by SPSS 17.0 for Windows (New York, USA). The continuous variables were expressed as mean±sd; categorical variables were expressed as n(%). The normal distribution is determined by Kolmogorov Smirnov test ad histogram. The differences of continuous variables between groups were calculated by the Mann Whitney U-test for variables that are not normally distributed; Student's t-test is used for normally distributed data. The correlations of the continuous variables were calculated by Spearman's Rho correlation. $p \leq 0.05$ was regarded as significant.

RESULTS

There was a male predominance with 96.3% (n=635). The mean age was 34.9±10.6 (range 18-74). The frequency of the patients between 18-24 of age was 22.6% (n=149); between 25-34 years of age 33.4% (n=220); between 35-44 years of age 27.8% (n=183); over the 45 years of age 16.2% (n=107). The most frequent admission was betwen the ages 26-35. The cause of occupational accident according to gender are expressed in Table 1. The most frequent cause of admission in both f the genders was "fall over something". The second most leading cause of accident was falling in males but penetrating traumas in females. There were more than one trauma region in 11.8% of the patients (n=78). Mortality was observed in two of the patients; there were more than one regional injury in both of the patients. The injury frequency of the body regions are expressed in Table 2.

There was no need to any consultation or hospitalisation for 42.3% (n=279); they are discharged from emergency department. The hospitalization rate was 7.1% (n=47). The hospitalization rate of machine related accidents was 80.0%, following with burns, (14.3%) and falling (9.9%).

There was only simple soft tissue injury in 48.1% (n=317) of the patients; following with laceration (28.2%, n=186); dislocation and bone fracture are observed in 12.6% (n=83) of the patients.

The median ISS score was 1 (range 1-75), mean 2.5±5.4; the median NISS score was 1 (range 1-75), mean 2.6±5.5; the median RTS score was 7.84 (1.96-7.84), mean 7.8±0.3. The median of the hospital cost was 27.9$ (range 7.0-4744.2); mean 112.9±359.8$. The ISS, NISS, RTS and hospital cost was similar in males and females (p values are 0.451, 0.401, 0.358,

Table 1. Occupational accident causes according to gender

	Male	Female	Total
Fall over something	241 (38.0%)	10 (41.7%)	251 (38.1%)
Falls	179 (28.2%)	3 (12.5%)	182 (27.6%)
Penetrating trauma	169 (26.6%)	7 (29.2%)	176 (26.7%)
Machine related accidents	25 (3.9%)	-	25 (3.8%)
Motor vehicle	13 (2.0%)	-	13 (2.0%)
Fire	5 (0.8%)	2 (8.3%)	7 (1.1%)
Electrical sources	1 (0.2%)	1 (4.2%)	2 (0.3%)
Inhalation	1 (0.2%)	1 (4.2%)	2 (0.3%)
Foreign substance damage	1 (0.2%)	-	1 (0.2%)

0.197 respectively).

ISS, NISS, RTS and hospital costs were all correlated positively but age was only correlated with ISS (Table 3).

DISCUSSION

In our study, hospital admissions due to occupational accidents are most frequently seen between 25-34 years of age. This result is similar with literature results; many studies and SSI of Turkey reports also supports that the most frequent admission was between 25-34 years of age (1,3,4,5,6). Male predominance is generally reported by previous studies like our study; the females was 3.7% of the patients in our study (1,3,4,5,6,9).

The most frequent accident type was “Fall over something” with a frequency of 38.1% followed by falls (27.6%) and penetrating injuries (26.7%) in our study. Barrs et al. (10) reported the most frequent cause as falls with a frequency of 51%, followed by “Fall over something” and machine accidents. Özkan et al. (11) reported the occupational accident most frequently due to penetrating or machine related accidents (48.5%) which is followed by blunt body trauma (21.5%) and falls (18.9%). Seyhan et al. (12) reported the occupational accident most frequently due to penetrating injuries (40.6%). Moradinazar et al. (13) reported the occupational accident most frequently due to falls (36%). Çelik et al. (14) reported the occupational accident most frequently due to penetrating or machine related accidents (39.8%) which is followed by blunt body trauma (24.2%) and falls (23.9%). The frequencies changes from one study to another; may be according to the job types near the hospital that study is performed.

In our study, the most frequently observed injury type was soft tissue trauma without any complication with a frequency of 48.1% which is followed by lacerations (28.2%) and bone fracture or dislocation (12.6%). Özkan et al. (11) reported the injury types similarly with our study; soft tissue injury 36.7%, lacerations 26.3% and bone fracture or dislocation (11.2%).

Table 2. The frequency of injured body region of occupational accidents

	n	%
Head and neck	101	15.3%
Face	7	1.1%
Thorax	29	4.4%
Abdomen	26	3.9%
Vertebra	26	3.9%
Pelvis	7	1.1%
Upper extremity	404	61.3%
Lower extremity	159	24.1%

Table 3. Correlations of age, ISS, NISS, RTS and hospital cost

		ISS	NISS	RTS	Hospital Cost
Age	***r***	0.079	0.072	0.003	0.074
	p	**0.043**	0.063	0.939	0.057
ISS	***r***		0.986**	-0.387	0.623
	p		**<0.001**	**<0.001**	**<0.001**
NISS	***r***			-0.382	0.629
	p			**<0.001**	**<0.001**
RTS	***r***				-0.272
	p				**<0.001**

Çelik et al. (14) reported the most frequent injury was lacerations (36.4%) followed by soft tissue injury (23.2%) and others.

The most frequently injuried body region was upper extremity (53.2%) followed by lower extremity (20.9%) and head-neck region (13.3%). Similarly with our study, other literature studies are reported the most frequent two injured body region were upper and lower extremity respectively (11,12,14,15,16,17).

The patients generally treated in emergency department without hospitalization (92.9%); the hospitalization rate was 7.1%. Friekmann et al. (15) reported the hospitalization rate as 37.5%; Karakut et al. (17) reported as 18.5%; Çelik et al. (14) reported 16.1%; Serinken et al. (18) reported 33.5%. Our patients were needed consultation from orthopedics (54%) and plastic and reconstructive surgery (33.1%). Durdu et al. (19) reported similarly, orthopedy consultation with a frequency of 30.6% and plastic surgery as 17.6%. Çelik et al. (14) reported, plastic surgery consultation with a frequency of 32.1% and orthopedy as 23.7%. The mean hospital cost was 112.9$. Thepaksorn et al. (20) reported the mean hospital cost as 190$ and Tuma et al. (21) as 15735$. The hospital cost changes from country to another.

The mean ISS score in our study was 2.51. Akdur et al. (22) reported the mean ISS as 13.3; Frickmann et al. (15) reported as 4; Tuma et al. (21) reported as 10 and Al-Thani et al. (23) reported as 11.7 and the mortality rate was 3.7% at Al-Thani' s study. Özkan et al. (11) reported the mean ISS was 4 and the mortality rate was 1%. In our study our mortality rate was 0.3%. There were very few studies about NISS score; Sutherland et al. (24) reported the mean NISS score was 9.25 at occupational accidents; in our study the mean NISS score was 2.56 and the NISS score was greater than ISS in our study similarly with Sutherland' s study. There was not any study that has reported RTS scores in occupational accidents. In our study the mean RTS score was 7.8. ISS, NISS, RTS and hospital costs were all correlated positively but age was only correlated with ISS.

In conclusion, according to our study results occupational accidents most frequently observed in males and between the ages 24-35; the most frequent cause was fall over something, but the most frequent cause of hospitalization was observed accidents due to falls. Most of the patients are discharged from emergency department without hospitalization. Additionally, ISS, NISS, RTS and hospital costs were all correlated positively. Occupational injuries could be reduced by education and precautions against accidents; also, the educations have to be repeated regularly according to the danger class of the work.

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