

Üçüncü Basamak Bir Hastanenin Acil Servisine Başvuran Ortopedik Adli Olguların İncelenmesi

Analysis of The Orthopedic Forensic Cases Admitted to The Emergency Department in A Tertiary Care Setting

Emin Uysal¹, Yahya Ayhan Acar²

1 Sağlık Bilimleri Üniversitesi, Bağcılar Eğitim ve Araştırma Hastanesi, Acil Tıp Kliniği, İstanbul, Türkiye

2 Sağlık Bilimleri Üniversitesi, Gülhane Tıp Fakültesi, Acil Tıp Kliniği, Ankara, Türkiye

ÖZ

GİRİŞ ve AMAÇ: Bu çalışmanın amacı acil servise (AS) başvuran ortopedik adli olguların değerlendirilmesidir.

YÖNTEM ve GEREÇLER: Üçüncü basamak bir sağlık kuruluşunun acil servisine 1 Haziran 2018 ve 30 Haziran 2018 tarihleri arasında başvuran adli olgular geriye dönük olarak incelendi. Ortopedi kliniğine konsulte edilmeyen ve yetersiz verisi olan olgular dışlandı. Yaş grupları (0-18 yaş, 19-64 yaş, 64 yaş üzeri), cinsiyet (kadın, erkek) travma etyolojisi (trafik kazaları, darp, kesici-delici alet yaralanmaları, ateşli silah yaralanmaları, elektrik yaralanmaları, göçük altında kalma yaralanmaları), cerrahi gereksinim, kırık varlığı, etkilenen vücut kısmı, hastaneye yatış durumu ve mortalite durumları, adli raporlar, hastane bilgi sistemi ve hasta dosyalarından kaydedildi.

BULGULAR: Toplamda 3732 adli olgu incelendi ve 500 tane ortopedik olgu çalışmaya dahil edildi. Başvuru nedenleri şu şekilde bulundu; trafik kazaları (n=301, % 60.2), darp (n=136, % 27.2), kesici delici alet yaralanmaları (n=15, % 3.0), düşmeler (n=25, % 5.0), ateşli silah yaralanmaları (n=21, % 4.2), elektrik yaralanmaları (n=1, % 0.2), göçük altında kalma (n=1, % 0.2). Yaralanan bölgelerde şu şekilde bulundu; üst ekstremité (n=195, % 39.0), alt ekstremité (n=174, % 34.8), spinal kolon (n=1, % 0.2), pelvis (n=21, % 4.2), çoklu travma (n=109, 21.8). Toplamda 41 (% 8.2) hastanın hastaneye yatırıldığı ve mortalitenin 4 (% 0.8) olguda görüldüğü bulundu. Cerrahi girişim gereksinimi ve kırık oranları 65 yaş üstü ve altı hastalarda istatistiksel olarak anlamlı şekilde farklıydı (sırasıyla p=0.015 ve p=0.005; Ki-Kare testi).

TARTIŞMA ve SONUÇ: Bu çalışma ortopedik yaralanmaların eşlik ettiği adli olgularda cerrahi girişim gereksinimi ve kırık ile ilişkili tek faktörün yaş olduğunu göstermiştir.

Anahtar Kelimeler: Adli olgular, ortopedik, kırık, yaş

ABSTRACT

INTRODUCTION: This study aims to evaluate the orthopedic forensic cases admitted to the emergency department (ED).

METHODS: Forensic cases admitted to the ED were analyzed retrospectively between June 01st, 2018 and June 30th, 2018 in a tertiary care setting. Patients who were not consulted to the Orthopedics clinic and with insufficient data were excluded. Age groups (0-18 years, 19-64 years, >64 years), gender (male, female), trauma etiology (traffic accidents, physical assault, penetrating injuries, falls, gunshot injuries, electrical injuries, dent injuries), surgical intervention requirement, presence of fracture, affected body part, hospitalization and mortality status were recorded from hospital information system, forensic reports, and patient charts.

RESULTS: A total of 3732 forensic cases were analyzed and 500 orthopedic cases were included in the study. Admission causes were as follows: traffic accidents (n=301, 60.2%), physical assault (n=136, 27.2%), penetrating injuries (n=15, 3.0%), falls (n=25, 5.0%), gunshot injuries (n=21, 4.2%), electrical injuries (n=1, 0.2%), dent injury (n=1, 0.2%). Reported injury sites were as follows: upper extremity (n=195, 39.0%), lower extremity (n=174, 34.8%), spinal colon (n=1, 0.2%), pelvis (n=21, 4.2%), multiple trauma (n=109, 21.8%). A total of 41 (8.2%) patients required hospitalization mortality was positive in 4 (0.8%) patients. Surgical intervention and fracture rates were statistically significant between patients over and under 65 years old (p=0.015 and 0.005, respectively; Chi-square test).

DISCUSSION AND CONCLUSION: The current study showed that the only factor related to fracture and surgical intervention was the age among forensic cases with a complaint of orthopedic injury.

Keywords: Forensic cases, orthopedics, fracture, age

İletişim / Correspondence:

Emin Uysal

Sağlık Bilimleri Üniversitesi, Bağcılar Eğitim ve Araştırma Hastanesi, Acil Tıp Kliniği, İstanbul, Türkiye

E-mail: dreminuysal@hotmail.com

Başvuru Tarihi: 10.07.2019

Kabul Tarihi: 09.11.2020

INTRODUCTION

Trauma-related injuries are one of the most frequent emergency department (ED) admission cause, and it is a public health problem. The mortality rate was reported as 0.17% among EDs in the US, and the annual cost was estimated at 15 billion US dollars (1). Traumatic brain injury was reported higher in pediatric (under the age of 18 years) and elderly (over the age of 85 years) (1). Management of the trauma patients required a systemic approach, and different levels of trauma centers seem to be beneficial (2, 3).

Forensic cases should be evaluated according to local regulations in addition to medical management. In Turkey, in which the current study was conducted, all the forensic cases must be reported to the security and law authorities. These forensic cases are mainly traffic accidents, physical assaults, falls, gunshot wounds, abuse, intoxications, and suicidal attempts. However, regulations authorize the physicians to report any cases with suspicion as being a forensic case. In general, all the trauma patients in the ED should be managed as a forensic case until proven otherwise (4).

Orthopedic trauma cases are frequent among all ED admissions as well as forensic cases. In the current study, the authors aimed to analyze the orthopedic forensic cases evaluated in the ED.

MATERIAL AND METHODS

This is a retrospective observational study. The local ethical committee approved the study protocol (2019.07.1.01.051). Forensic cases were analyzed between June 01st, 2018 and June 30th, 2018 in a tertiary care setting's ED which has over 500000 visits per year. All of the forensic cases who were consulted to the Orthopedics clinic were included in the study. Patients who were not consulted to the Orthopedics clinic and with insufficient data were excluded. Age groups (0-18 years, 19-64 years, >64 years), gender (male, female), trauma etiology (traffic accidents, physical assault, penetrating injuries, falls, gunshot injuries, electrical injuries, dent injuries), surgical intervention requirement, presence of fracture, affected body part, hospitalization and mortality status were recorded from hospital information system, forensic reports, and patient charts.

The primary outcome of the current study was to measure the demographic and clinical characteristics of forensic cases which were admitted to the ED and consulted to the Orthopedics clinic.

Statistical analyses

Descriptive statistics were presented as a frequency (percentage) for categorical variables. The Kolmogorov-Smirnov test was used to test the distribution of the data. Data were presented as mean \pm standard deviation (SD) for normally distributed data. Kruskal Wallis test was used to compare the groups with non-normally distributed data. The Chi-square test was used to compare categorical variables. All statistical tests were performed with the Predictive Analytics Software (PASW, version 18; SPSS Inc, Chicago, IL). A p value of less than 0.05 was considered statistically significant.

RESULTS

During the study period, a total of 46886 patients admitted to the hosting facility and 3732 of them were forensic cases. All the forensic case reports were analyzed, and 500 cases which were consulted to the Orthopedics clinic were included in the study. Demographics were given in Table 1. Admission causes were as follows: traffic accidents (n=301, 60.2%), physical assault (n=136, 27.2%), penetrating injuries (n=15, 3.0%), falls (n=25, 5.0%), gunshot injuries (n=21, 4.2%), electrical injuries (n=1, 0.2%), dent injury (n=1, 0.2%). Reported injury sites were as follows: upper extremity (n=195, 39.0%), lower extremity (n=174, 34.8%), spinal colon (n=1, 0.2%), pelvis (n=21, 4.2%), and multiple trauma (n=109, 21.8%). A total of 41 (8.2%) patients required hospitalization, and mean hospitalization time was 4.22 ± 3.17 days (minimum: 1, maximum: 14). Mortality was positive in 4 (0.8%) patients. Age groups did not show any statistically significant difference in gender (p=0.12, Chi-square test). Hospitalization time did not show any statistically significant difference between age groups (p=0.104, Kruskal Wallis test).

Surgical intervention rates showed statistically significant differences according to age group (p=0.005) but did not differ according to gender and injury site (p=0.378 and 0.350, respectively) (Table 2).

Table 1: Demographics of the patients included in the study.

Parameters	n	%
Age group		
0-18 years	185	37.0
19-64 years	293	58.6
≥65 years	22	4.4
Gender		
Male	376	75.2
Female	124	24.8
Injury type		
Traffic accident	301	60.2
Physical assault	135	27.0
Penetrating trauma	16	3.2
Fall	25	5.0
Gunshot injury	21	4.2
Electrical injury	1	0.2
Others	1	0.2
Injury site		
Upper extremity	195	39.0
Lower extremity	174	34.8
Spinal colon	1	0.2
Pelvis	21	4.2
Multiple trauma	109	21.8
Surgery need		
Yes	15	3.0
No	485	97.0
Fracture		
Yes	87	17.4
No	413	82.6

Table 2. Distribution of the surgery need according to age group, gender, and injury site.

		n (%)	Surgery Need		Total	p*
			Negative	Positive		
Age group	0-18 years	n (%)	185 (100 %)	0 (0 %)	185	0.005
	19-64 years	n (%)	280 (95.5 %)	13 (4.5 %)	293	
	≥65 years	n (%)	20 (90.9 %)	2 (9.1 %)	22	
Gender	Female	n (%)	122 (98.4 %)	2 (1.6 %)	124	0.378
	Male	n (%)	363 (96.5 %)	13 (3.5 %)	376	
Injury Site	Upper extremity	n (%)	193 (98.9 %)	2 (1.1 %)	195	0.350
	Lower extremity	n (%)	167 (95.9 %)	7 (4.1 %)	174	
	Spinal cord	n (%)	1 (100 %)	0 (0 %)	1	
	Pelvis	n (%)	20 (95.2 %)	1 (4.8 %)	21	
	Multiple trauma	n (%)	104 (95.4 %)	5 (4.6 %)	109	

*: Chi-square test.

In patients over 65 years old (n=22, 4.4%) while fracture occurred in 8 patients and surgical intervention was needed in 2 (% 0.44) patients. There was a statistically significant difference

between fracture rates according to age groups and injury site, but not gender (p=0.015, 0.002, and 0.274; respectively) (Table 3).

Table 3. Distribution of the fractures according to age group, gender, and injury site.

		n (%)	Fracture		Total	p*
			Negative	Positive		
Age group	0-18 years	n (%)	161 (87.2 %)	24 (12.8 %)	185	0.015
	19-64 years	n (%)	238 (81.2 %)	55 (18.8 %)	293	
	≥65 years	n (%)	14 (63.6 %)	8 (36.4 %)	22	
Gender	Female	n (%)	107 (86.3 %)	17 (13.7 %)	124	0.274
	Male	n (%)	306 (81.4 %)	70 (18.6 %)	376	
Injury site	Upper extremity	n (%)	171 (87.7 %)	24 (12.3 %)	195	0.002
	Lower extremity	n (%)	147 (84.5 %)	27 (15.5 %)	174	
	Spinal cord	n (%)	0 (0 %)	1 (100 %)	1	
	Pelvis	n (%)	16 (76.2 %)	5 (23.8 %)	21	
	Multiple trauma	n (%)	79 (72.5 %)	30 (27.5 %)	109	

*: Chi-square test.

DISCUSSION

Current study showed that forensic cases with the complaint of orthopedic injury did have low mortality rates and the only factor related to the fracture and surgical intervention was age. Therefore, knowing that elderly patients were under the risk of fracture and may require surgical intervention emergency physicians should give a suspicion to elderly forensic cases with orthopedic trauma. Gurkan et al. reported that the forensic cases applied to the outpatient units of Orthopedics clinics were mainly males (n=90, 78.3%) and the most common trauma etiologies were traffic accidents (n=40, 34.8%) and physical assaults (n=32, 27.8%) (5). Lower (n=36, 31.3%) and upper (n=28, 24.3%) extremities were the most common affected body parts (5). Güven et al. reported that among the forensic cases admitted to a university hospital males (76.8%) were predominant and the most common etiology was the traffic accidents (n=309, 30.9%) (6). Their findings showed that 257 (19.8%) of the cases had a fracture, and 17.3% of the cases treated in the Orthopedics clinic (6). Current study revealed similar results for all age groups. Traffic accidents were the most frequent cause in all age groups. Physical assault was the second most common cause in the patients under 65-year-old. Among patients over the 65-year-old, falls were the second most

common cause of trauma. These findings and current literature suggest that adult males are under the risk of trauma-related forensic cases. As they are the main determinant of the labor force, especially orthopedic injuries are related to the loss of labor and increase the cost relatively.

Aktas et al. analyzed the forensic cases admitted to the ED and reported that 24.1% of the patients were under age of 18, and 3.0% of the cases were over the age of 65 years while 24.2% of them were hospitalized in Orthopedics clinic (7). Present study also determined that hospitalization rates are willing to increase in the older age group.

Yuzbasioglu et al. retrospectively analyzed the forensic cases in refugees and reported that the median age was 24 years (interquartile range: 17-33) and the most common etiologies were traffic accidents (27.4%) and assaults (25.8%) (8). They reported that the most common reason for hospital admissions were orthopedic injuries (8). Er et al. studied the Syrian civil war injuries admitted to the ED and reported that pediatric and adult cases were similar by means of mortality and injury severity scores but injury sites were different between adult and pediatric groups (9). Extremity injuries (23.3%) were the third most common injury site among all their population after the head (42.5%) and thorax

(37.1%) (9). A total of 26 patients were refugees in our study and assaults, and traffic accidents were the most common reason among orthopedic forensic cases.

Gurkan et al. reported that mortality was not occurred in any forensic cases (6). Current study showed that any forensic case of which primary injury was orthopedic did not have mortality. One may consider that, orthopedic injuries are not mainly life-threatening or they may be diagnosed in the early phase of ED management. Additionally, if the major bleeding is not accompanying to the orthopedic trauma, mortality may be rare, and these results can be attributed to this phenomenon.

Alimohammadi et al. reported that emergency physicians were sued mainly because of trauma cases and 60.9% of the cases were aged between 18 and 60 years while 39.1% of the cases they were in the pediatric and geriatric group (10). Authors did not analyze prosecutions or claims against emergency physicians, however emergency physicians are under the risk of being sued and trauma cases should be examined in a detailed manner.

Limitations

Retrospective design is the major limitation of the current study. Being a single-center study may complicate to the generalizability of the outcomes. Additionally, follow-up data of the patients could not be analyzed.

Conclusions

The authors concluded that emergency physicians should give high suspicion to elderly forensic patients orthopedic trauma.

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