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Forensic Emergency Medicine – Six-Year Experience of 13823 Cases in a University Emergency Department

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Aims: Clinical forensic medicine deals with cases involving both the legal and medical aspects of patient care, such as motor vehicle trauma or poisoning. In this study, we aimed to draw attention to the forensic issues by retrospective investigation of 13823 emergency cases and to share our experiences on this topic.

Materials and Methods: This retrospective study was conducted in a university Emergency Department (ED) in Ankara, Turkey. The data were collected from official hospital police sheets.

Results: Between 2000 and 2005, 13823 legal cases (3.66% of all ED patients) were examined, and 58.23% of them were male. The mean age was 28.03±16.42 years. The main injury patterns were motor vehicle trauma (43.84%), physical assault (19.04%), suicide attempts (17.10%), and carbon monoxide (CO) poisoning (6.62%). Most of the cases were in the 20–29 years of age group (30.01%). Suicide attempts, CO poisoning and sexual assault victims were mostly female. 46.47% of the cases were admitted to the ED between 16:00 and 23:59. Forensic cases were mostly reported in May (9.92%). Two hundred and forty-two forensic cases died in the ED and 42 died outside the ED previously; 71.53% of them were male. The main cause of death was motor vehicle trauma (62.50%).

Conclusions: Emergency physicians will face the challenges of addressing both medical and forensic needs of ED patients.

Key Words: Forensic medicine, emergency medicine, traffic accidents, violence, suicide, carbon monoxide poisoning

Adli Acil Tıp – Bir Üniversite Acil Servisindeki 6 Yıllık 13823 Olgunun Tecrübesi

Amaç: Klinik adli tıp; motorlu araç kazaları ve zehirlenme gibi vakaların hem tıbbi, hem de adli yönden bakımlarıyla uğraşır. Biz bu çalışmayla 13823 adli vakayı inceleyerek acil tıptaki adli gereksinimlere dikkat çekmek ve bu alandaki deneyimlerimizi paylaşmayı hedefledik.

Gereç ve Yöntem: Bu retrospektif çalışma, Ankara – Türkiye'deki bir üniversite acil servisinde yapıldı. Veriler hastane polis kayıtlarından elde edildi.

Bulgular: 2000 – 2005 yılları arasındaki 13823 adli vaka (acil servisin bütün hastalarının % 3,66'sı) incelendi. Yaş ortalaması 28,03 ± 16,42 yıl idi. Vakaların % 58,23'ü erkekti. Başlıca görülen adli olaylar; motorlu araç kazaları (% 43,84), darp (% 19,04), intihar girişimleri (% 17,10) ve karbonmonoksit zehirlenmesiydi (% 6,62). Vakaların çoğunluğu 20-29 yaş grubu içindeydi (% 30,01). İntihar girişimleri, karbon monoksit zehirlenmesi ve cinsel istismar vakalarının çoğunluğu kadındı. Vakaların % 46,47'si acil servise 16:00 ile 23:59 saatleri arasında kabul edildi. Adli olguların çoğu Mayıs ayında rapor edildi (% 9,92). 242 adli vaka, acil servis içinde öldü ve 42 vaka da acil servis dışında ölmüştü. Ölenlerin % 71,53'ü erkekti. Ölümlerin en önemli nedeni motorlu araç kazalarıydı (% 62,5).

Sonuç: Acil tıp doktorları, acil servis hastalarının hem tıbbi hem de adli gereksinimleriyle yüzleşeceklerdir.

Anahtar Sözcükler: adli tıp, acil tıp, trafik kazaları, şiddet, intihar, karbonmonoksit zehirlenmesi

Introduction

As the perpetual gatekeeper to the medical system, emergency medicine (EM) experiences many medicolegal interactions. Emergency Physicians (EPs) are in a unique position to evaluate these cases (1). EPs routinely evaluate the victims of motor vehicle trauma (MVT), gunshot and stab wounds, physical assault, domestic violence, sexual assault, elder abuse, suspicious deaths, child abuse, occupational injuries, suicide attempts, terrorist attacks, burns, electrical-related injuries, and poisonings in both adult and pediatric populations. Clinical forensic medicine (CFM) is the branch of medicine that deals specifically with cases involving both the legal and medical aspects of patient care

(2). CFM is the application of postmortem forensic medical knowledge and techniques to live patients in a clinical setting (1). Forensic evaluation refers to the detection, collection and preservation of evidence, documentation of testimonials and injuries, pattern injury recognition, interpretation of injuries, and reporting requirements and regulations (3). Significant progress has been made in the field of CFM over the past 40 years, yet there is still a pronounced gap between medicine and law. European and British physicians, known as police surgeons, forensic physicians, forensic medical examiners or forensic medical officers, have performed clinical forensic examinations for more than 200 years. CFM programs are also well established in Asia, Latin America and Australia. In the United States (US), the first CFM program was initiated at the University of Louisville Medical School in 1991 (1). In Turkey, the first lectures about forensic medicine were given in 1839 in İstanbul University School of Medicine, and the first CFM applications were started in the İstanbul Forensic Office in 1908 (4).

Trauma has been a significant cause of death and disability throughout history, and in recent years, it has become one of the most serious public health problems not only in developed societies, but also in intermediate and low-income countries. According to the data of the World Health Organization (WHO) published in 2004, 1.2 million people died with causes related to MVT, and 20 million people were injured or handicapped (5). In Turkey, a total of 586,769 traffic accidents occurred in 2006, and 3,365 people died and 135,224 were injured in these accidents (6). Another important public health problem is violence. Interpersonal violence is a major cause of morbidity and mortality worldwide. It has been estimated that there were 520,000 homicides worldwide in 2000 (7).

Clinical forensic medicine (CFM) is applicable to our profession, but the majority of EPs have not given much thought to what it is, or questioned how well it is practiced with our current level of training. Although we are well prepared to deal with our patients' medical needs, we are less aware of their forensic and legal needs (2). For many practitioners, CFM remains a relatively unexplored frontier of EM (3). The aim of this retrospective study was to identify the injury patterns and demographic characteristics of all 13823 forensic cases seen in the university pediatric and adult EDs over a six-year period. We report herein our experience, which may contribute to EM practice, so that EDs and EPs may be prepared forensically and medically, injury prevention may be enhanced, and the need of CFM training in EM residency programs may be remembered and included into the curriculum.

Materials and Methods

This retrospective study was conducted in Gazi University School of Medicine Hospital pediatric and adult EDs in Ankara, Turkey. Ankara is the capital of Turkey, with a population of four million, and it has approximately 4,000 emergency patients per day. Our hospital is a tertiary medical center with one thousand beds.

The data of forensic cases were collected from official hospital police sheets and medical records from January 1, 2000 to December 31, 2005. Inclusion criteria were all forensic cases. The collected data were analyzed to compare injury patterns with year, age, sex, and time interval and month of presentation. Furthermore, deceased forensic cases were analyzed for injury pattern and sex, and place of death (inside or outside the ED). Ethical committee approval was obtained.

Results

From 2000 to 2005, 253,784 adult and 133,675 pediatric, 377,457 patients in total, were admitted to our EDs. The records of 13823 forensic cases (3.66% of all ED patients) were reviewed. Although there was a decreasing trend in the number of admitted patients, especially in 2004 and 2005, there was an increasing trend in forensic cases over the years (in 2000, 2.7%; in 2005, 5.6%) (Table 1). The most common injury patterns in forensic cases were MVT (43.84%), physical assault (19.04%) and suicide attempts (17.10%), respectively (Table 2). The mean age was 28.0 ± 16.4 SD (from 0 to 98) years.

It was seen that most of the forensic cases were in the 20-29 (30.01%) years of age group, followed by the 10-19 (19.42%) and 30-39 (15.93%) age groups. In all these age groups, the main injury patterns were MVT, physical assault, suicide attempts and carbon monoxide (CO) poisoning, respectively (Table 3). Of the total cases, 8049 (58.23%) were male and 5774 (41.77%) female.

Table 1. Number of Forensic and Non Forensic Cases Admitted to the Pediatric and Adult ED

Year	Pediatric			Adult			TOTAL		
	Forensic	%	ED Patient	Forensic	%	ED Patient	Forensic	%	ED Patient
2000	372	1.96	19.025	1.103	3.10	35.526	1.475	2.70	54.551
2001	371	1.74	21.360	1.255	3.50	35.857	1.626	2.84	57.217
2002	440	1.90	23.127	1.366	3.17	43.109	1.806	2.73	66.236
2003	630	2.63	23.963	1.538	3.25	47.347	2.168	3.04	71.310
2004	813	3.45	23.587	2.511	5.77	43.485	3.324	4.96	67.072
2005	737	3.26	22.613	2.687	6.99	38.460	3.424	5.61	61.073
Total	3.363	2.52	133.675	10.460	4.29	243.784	13.823	3.66	377.459

Table 2. Injury Patterns of Forensic Cases and Distrubition According to Years

Injury Pattern	Years													
	2000		2001		2002		2003		2004		2005		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Motor Vehicle Trauma	689	11.37	666	10.99	797	13.15	860	14.19	1501	24.77	1547	25.53	6060	43.84
Physical Assault	271	10.30	390	14.82	314	11.93	419	15.92	608	23.10	630	23.94	2632	19.04
Suicide Attempts	313	13.24	374	15.82	401	16.96	392	16.58	445	18.82	439	18.57	2364	17.10
Carbon monoxide Poisoning	18	1.97	51	5.57	78	8.52	170	18.58	295	32.24	303	33.11	915	6.62
Occupational Injuries	55	10.22	28	5.20	51	9.48	68	12.64	156	29.00	180	33.46	538	3.89
Stab-Cut Injuries	52	10.66	52	10.66	47	9.63	82	16.80	131	26.84	124	25.41	488	3.53
Fall	27	7.44	32	8.82	49	13.50	70	19.28	96	26.45	89	24.52	363	2.63
Corosives	5	3.65	5	3.65	11	8.03	39	28.47	35	25.55	42	30.66	137	0.99
Gunshot (Firearm) Wounds	22	16.42	14	10.45	17	12.69	18	13.43	24	17.91	39	29.10	134	0.97
Electrical-Related Injuries	4	8.16	6	12.24	11	22.45	9	18.37	14	28.57	5	10.20	49	0.35
Alcohol-Subtance Abuse	1	3.33			6	20.00	6	20.00	4	13.33	13	43.33	30	0.22
Child Abuse-Neglect	4	16.67	1	4.17	2	8.33	12	50.00	5	20.83			24	0.17
Suspicious Deaths			2	11.76	5	29.41	4	23.53	3	17.65	3	17.65	17	0.12
Sexual Assault					2	25.00	2	25.00	2	25.00	2	25.00	8	0.06
Other	14	21.88	5	7.81	15	23.44	17	26.56	5	7.81	8	12.50	64	0.46
Total	1475	10.67	1626	11.76	1806	13.07	2168	15.68	3324	24.05	3424	24.77	13823	100.00

While the main injury patterns for the males were MVT, physical assault and occupational injuries, for females, these were MVT, suicide attempts and CO poisoning (Table 4). Most of the forensic cases (46.57%) were admitted to the ED between 16:00 and 23:59. The main injuries observed in this time period were MVT, physical assault and suicide attempts, respectively (Table 5). During the six-year period, most of the forensic cases were admitted in May (9.92%), and the smallest number of forensic cases was detected in February (6.32%) (Table 6). While 246 of the forensic cases died in the ED, 42 cases had died previously outside the ED, and all deaths accounted for 2.08% of all forensic cases. The main causes of death were MVT, fall from height, gunshot wounds and suspicious deaths, respectively, and 71.53% of all deceased forensic cases were male (Table 7).

Discussion

One of the goals of EM practice is to deliver high quality health care. Familiarity with the clinical forensic medical examination can improve the health care quality delivered to patients in the ED (8). Good medical practice obligates physicians and health care providers in EDs to serve as an interface between patients and the state

Table 3. Injury Patterns of Forensic Cases and Distrubition According to Age Groups

Injury Pattern	Age groups											
	0 - 10	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80 - 89	90 - +	Total	%
Motor-Vehicle Trauma	637	917	1645	972	834	521	285	202	42	5	6060	43.84
Physicial Assault	202	508	932	494	306	122	42	20	5	1	2632	19.04
Suicide Attempts	330	741	837	260	132	42	11	7	3	1	2364	17.10
CO Poisoning	122	163	195	160	140	68	43	17	7		915	6.62
Occupational Injuries	3	75	186	130	111	26	4	3			538	3.89
Stab-Cut Injuries	30	154	166	75	45	13	4	1			488	3.53
Fall	118	57	84	43	30	16	11	3	1		363	2.63
Corosives	114	8	7	5	3						137	0.99
Gunshot (Firearm) Wounds	3	16	52	40	17	4		2			134	0.97
Electrical-Related Injuries	7	6	14	13	6	2	1				49	0.35
Alcohol-Subtance Abuse	3	13	8	3	1	2					30	0.22
Child Abuse-Neglect	15	7	1				1				24	0.17
Suspicious Deaths	5	1	1	1	4	5					17	0.12
Sexual Assault	5	2	1								8	0.06
Other	13	16	19	6	6	2	1	1			64	0.46
Total	1607	2684	4148	2202	1635	823	403	256	58	7	13823	100.00
%	11.63	19.42	30.01	15.93	11.83	5.95	2.92	1.85	0.42	0.05	100.00	

Table 4. Injury Patterns of Forensic Cases and Distrubition According to Sex

Injury Pattern	Male		Female		Total	
	n	%	n	%	n	%
Motor-Vehicle Trauma	3495	57.67	2565	42.33	6060	43.84
Physicial Assault	1932	73.40	700	26.60	2632	19.04
Suicide Attempts	728	30.80	1636	69.20	2364	17.10
CO Poisoning	366	40.00	549	60.00	915	6.62
Occupational Injuries	519	96.47	19	3.53	538	3.89
Stab-Cut Injuries	425	87.09	63	12.91	488	3.53
Fall	266	73.28	97	26.72	363	2.63
Corosives	87	63.50	50	36.50	137	0.99
Gunshot (Firearm) Wounds	110	82.09	24	17.91	134	0.97
Electrical-Related Injuries	37	75.51	12	24.49	49	0.35
Alcohol-Subtance Abuse	18	60.00	12	40.00	30	0.22
Child Abuse-Neglect	13	54.17	11	45.83	24	0.17
Suspicious Deaths	11	64.71	6	35.29	17	0.12
Sexual Assault	2	25.00	6	75.00	8	0.06
Other	40	62.50	24	37.50	64	0.46
Total	8049	58.23	5774	41.77	13823	100.00

within the context of public health and the legal and justice systems. Physicians must be aware of public health and legal obligations (9).

EDs frequently receive requests from law enforcement officials for statements and medicolegal reports pertaining to injuries treated in the ED. These reports and statements are used by police, lawyers and the courts, who require information to support or refute allegations and assist in the accurate assignment of criminal charges (8). In our country, it is an obligation to report the forensic-related issues to the police according to our laws. The forensic cases are reported to the hospital police initially by physicians in the ED. If the law enforcement officials need detailed information, they request a consultation from forensic medicine physicians and/or other specialists.

Table 5. Injury Patterns of Forensic Cases and Distrubition According to Time Interval

Injury Pattern	Time Interval							
	00:00 - 07:59		08:00 - 15:59		16:00 - 23:59		Total	
	n	%	n	%	n	%	n	%
Motor-Vehicle Trauma	1127	18.60	2117	34.93	2816	46.47	6060	43.84
Physicial Assault	511	19.41	830	31.53	1291	49.05	2632	19.04
Suicide Attempts	663	28.05	587	24.83	1114	47.12	2364	17.10
CO Poisoning	355	38.80	235	25.68	325	35.52	915	6.62
Occupational Injuries	42	7.81	270	50.19	226	42.01	538	3.89
Stab-Cut Injuries	112	22.95	134	27.46	242	49.59	488	3.53
Fall	37	10.19	140	38.57	186	51.24	363	2.63
Corosives	6	4.38	39	28.47	92	67.15	137	0.99
Gunshot (Firearm) Wounds	34	25.37	44	32.84	56	41.79	134	0.97
Electrical-Related Injuries	8	16.33	19	38.78	22	44.90	49	0.35
Alcohol-Subtance Abuse	8	26.67	7	23.33	15	50.00	30	0.22
Child Abuse-Neglect	3	12.50	10	41.67	11	45.83	24	0.17
Suspicious Deaths	4	23.53	8	47.06	5	29.41	17	0.12
Sexual Assault	2	25.00	2	25.00	4	50.00	8	0.06
Other	10	15,63	22	34.38	32	50.00	64	0.46
Total	2922	21.14	4464	32.29	6437	46.57	13823	100.00

Table 6. Injury Patterns of Forensic Cases and Distrubition According to Months of a Year

Injury Pattern	Month													
	1	2	3	4	5	6	7	8	9	10	11	12	Total	%
Motor-Vehicle Trauma	362	320	471	453	627	586	569	560	557	561	493	501	6060	43.84
Physicial Assault	135	140	194	347	283	207	231	232	194	218	222	229	2632	19.04
Suicide Attempts	204	166	212	210	244	177	181	187	178	189	189	227	2364	17.10
CO Poisoning	145	163	107	70	30	18	4	1	7	53	133	184	915	6.62
Occupational Injuries	21	14	33	30	57	64	65	55	57	53	43	46	538	3.89
Stab-Cut Injuries	23	29	44	38	52	29	38	47	31	58	38	61	488	3.53
Fall	11	14	25	20	33	42	35	56	36	45	28	18	363	2.63
Corosives	6	9	9	7	7	12	17	15	19	14	8	14	137	0.99
Gunshot (Firearm) Wounds	15	7	10	12	12	13	4	12	4	23	12	10	134	0.97
Electrical-Related Injuries	3	2	4	3	5	5	5	5	4	3	7	3	49	0.35
Alcohol-Subtance Abuse	1	6	6	2		2	1		6	3	3		30	0.22
Child Abuse-Neglect			1	1	3	2	1	9	1	1	1	4	24	0.17
Suspicious Deaths	1	2		1	2	1	3		3	1	2	1	17	0.12
Sexual Assault	1				2		1	1	1	1		1	8	0.06
Other	4	1	3	10	14	6	6	3	4	6	6	1	64	0.46
Total	932	873	1119	1204	1371	1164	1161	1183	1102	1229	1185	1300	13823	100.00
%	6.74	6.32	8.10	8.71	9.92	8.42	8.40	8.56	7.97	8.89	8.57	9.40	100.00	

Table 7. Injury Patterns of Dead Forensic Cases and Distrubition According to Sex and Place of Death in or out of ED

Injury Pattern	Ex in ED			Ex Out of ED			Total	
	Male	Female	Total	Male	Female	Total	n	%
Motor-Vehicle Trauma	122	43	165	8	7	15	180	62.50
Fall from Height	14	8	22	1	1	2	24	8.33
Gunshot (Firearm) Wounds	13	3	16	1		1	17	5.90
Suspicious Deaths	5	5	10	6	1	7	17	5.90
Stab-Cut Injuries	10	3	13				13	4.51
Cardiopulmonary Arrest				6	4	10	10	3.47
Occupational Injuries	6		6	1		1	7	2.43
Suicide Attempts	2	2	4	1		1	5	1.74
Electrical-Related Injuries	3		3				3	1.04
Physicial Assault		2	2		1	1	3	1.04
Child Abuse-Neglect				3		3	3	1.04
Alcohol-Subtance Abuse	1	1	2				2	0.69
CO Poisoning		1	1				1	0.35
Other	2		2	1		1	3	1.04
Total	178	68	246	28	14	42	288	100.00
%	61.81	23.61	85.42	9.72	4.86	14.58	100.00	

Our ED is a tertiary medical center to which a great number of patients apply. Forensic cases account of 3.66% of all ED patients (see Table 1). The number of forensic cases has been increasing annually (see Table 2). This may be due to the increase in crime throughout the world as well as in Turkey. As the EPs learn more about CFM, they recognize the victims more easily and report to the police more frequently. The number of experienced senior EPs and attendings have increased, and they also advise the juniors to report the forensic cases.

Motor vehicle trauma is the leading cause of injury-related deaths around the world. WHO and the World Bank have pointed out that MVT, particularly in countries with low and medium income levels, is a public health problem (5). Di Bartolomeo et al. (10) evaluated 627 major injury cases in their study. They found that males were primarily (79.1%) affected, young adults predominated (aged 15-24 [21.05%]), children below 14 years were the minority (2.71%), and the elderly (over 60 years) accounted for 23.06%. Injuries mostly occurred at night, from 20:00 to 08:00. Most injuries occurred in June, July and September, and 2.4% of cases had died on the accident scene or during the transportation.

In this study, 6060 cases were reported as MVT injury. This accounted for 43.84% of all forensic cases. The increasing trend in MVT can be seen in Table 2. Most of the cases were young adults in the 20-29 years of age group, while children under 10 years accounted for 11.63% and individuals over 60 years for 5.24%. The percentage of males in MVT cases was 57.67%. MVT cases were mostly seen in the 16:00–23:59 time interval and in May. One hundred and sixty-five cases died in the ED and 15 cases died outside the ED related to MVT, which accounted for 62.5% of all deceased forensic cases; 72.22% of deceased forensic cases due to MVT were male (see Tables 3-7).

Violence has become an important public health issue throughout the world. It is one of the leading causes of mortality in the world, with an estimated 1.6 million deaths reported in 2000. The rates of violence vary greatly between regions of the world and individual countries, but developing countries carry the greatest burden (11). Sivarajasingam and Shepherd (12) realized a study between 1995 and 1998 in England and Wales, during which period 121,475 assaults were recorded, accounting for 2.5% of all ED admissions. While 74% of them had sustained injury, 45% were aged between 18-30 years. Significant seasonal trends were identified for both sexes and all age groups, and peaks were found in July to September. The numbers of women injured and those aged 31-50 increased significantly.

In our study, physical assault victims accounted for 19.04% (2632 cases) of all forensic cases. Victims were mainly in young age groups, as 932 victims (21.5%) of all assaults were in the 20-29 years of age group. Males accounted for 73.40%, and assault victims were mostly admitted to the ED in the 16:00-23:59 time period. The highest number of assault victims was seen in April. Two cases died in the ED and one died outside the ED, and all of them were female (see Tables 2-7).

In 2005, suicide was the second leading cause of death among Americans 40 years of age or younger. Among Americans of all ages, more than half of all suicides are gun suicides (14). In our study, 2364 cases (17.10%) of all forensic cases were recorded as suicide attempts. This was the third major forensic issue in our study. The number of cases increased yearly. Most of the patients were in the 20–29 years of age group (837 cases) and in the 13–19 years of age group (1741 cases), and 1636 (69.20%) victims were female. Suicide cases were mostly admitted to the ED between 16:00-23:59 and in May (244 cases). Four cases died in ED and one case died outside the ED. Three were male and two were female. Suicide attempts were the second forensic issue in females after MVT (see Tables 2-7).

Carbon monoxide poisoning is often unintentional and results in low (or unrecognized) morbidity, and severe CO poisoning is a preventable cause of death. Domestic CO poisoning is a serious public health problem, which demands greater efforts in public and medical education (15). During the six-year period, we admitted 915 CO poisoning victims, accounting for 6.62% of all forensic cases, and 88.82% of them were under 40 years old. It was most commonly found in the 20–29 years of age group (30.01%). Of those, 549 victims were female and accounted for 60.00% of all cases. As expected, most of the cases were admitted between 00:00 and 07:59, and in winter months; few cases were seen in spring and summer. One woman died outside the ED due to CO poisoning (see Tables 2-7).

Estimates of non-fatal work-related injuries range from 6 to 13 million annually, and the most serious injuries seen in the hospital EDs include falls, cuts, open wounds, vehicle accidents, and electrocutions (16). McCaig et al. (17) reported that the average annual rate of work-related injury visits was 3.5 per 100 workers. Persons 16-19 years of age had higher work-related injury visits, and males had a higher injury rate than females. In our study, 538 victims (3.89%) presenting with occupational injuries were recorded. Most of the cases were in the 20-29 (186 cases) and 30-39 (130 cases) age groups, and 96.47% of them were male. Most of them were admitted to the ED between 08:00-15:59. The cases were mostly seen in June and July. Six males and six females died in the ED, while one male and one female died outside the ED (see Tables 2-7).

Weapons play a large part in inflicting violent injury. Violence involving firearms is a significant problem in the US. In much of the rest of the world, firearm availability and use are much lower (11). A stab or cut is an injury inflicted on the skin by contact with a sharp object. Knife blades, shards of glass, and fragments of metal can penetrate the skin and leave a cutting pattern. Brennan et al. (18) conducted a six-year period study in England, and 24,660 patients were reported as assault with a total of 31,315 injuries. Men accounted for 74.5% of the sample. Whereas 21.5% of victims were inflicted with a weapon, 11% of all injuries were inflicted with a sharp object and 10.5% with a blunt object.

In our study, there were 488 (3.53%) stab – cut injuries and 134 (0,97%) gunshot wounds. Most of the patients were in the 20–29 age group. More than 80% of the cases were male and they were mostly admitted to the ED between 16:00–23:59. Most of the cases were seen in October. Thirteen males and three females died in the ED and one male died outside the ED as a result of gunshot wounds. Ten males and three females died in the ED due to stab – cut injuries (See Tables 2-7).

The causes of a fall may include acute or chronic diseases, medications, and environmental factors. Falls are common causes of injury in children, elderly people and workers (19). In this study, we recorded 363 cases (2.63%) as fall. Most of the patients were in the 0–10 age group (118 cases), followed by the 20–29 age group (189 cases), and only 15 patients were over 60 years old. Most of the patients were admitted to the ED between 16:00–23:59, and 266 of them (73.28%) were male. Most of the cases were seen in August. Fall from heights was the second leading cause of death in forensic victims, which accounted for 8.33% (24 cases). Fourteen males and eight females died in the ED and one male and one female died outside the ED (see Tables 2-7).

Human exposure to corrosives is a common problem. Most exposures are unintentional, with many occurring in

children younger than age six. Household bleach (sodium hypochlorite) is the most common alkali exposure reported in the American Association of Poison Control Centers (AAPCC) data, accounting for more than 50,000 exposures per year (20). Exposures to hydrocarbons and volatiles most commonly occur by ingestion or inhalation. Most hydrocarbon exposures have a benign clinical course. The AAPCC revealed that 66,645 potential exposures were reported (3% of all exposures) in 1997 (21).

In our study, there were 137 victims (0.99%) who presented in the ED with ingestion or inhalation of corrosives. One hundred and fourteen of 137 victims were in the 0 – 10 age group. Children were primarily affected, and 63.50% of the cases were male. They were mainly admitted to the ED between 16:00–23:59. Most of the cases were seen in July and September. We did not record any death related to ingestion/inhalation of corrosives (see Tables 2-7).

Electrical burns continue to be responsible for significant mortality in developing countries. Most electrical fatalities and adult admissions to burn centers from electrical injury are occupationally related (22). Electrical-related injuries accounted for 0.22% of patients (30 cases), and 75.51% of them were male, mostly in the 20–29 age group. Most of them were admitted to the ED between 16:00–23:59, and in November. Three males died in the ED due to electrical–related injury (see Tables 2-7).

Alcohol is the most commonly used drug associated with pharmacologic violence. The pharmacologic effects of alcohol contribute significantly to the prevalence of adolescent fighting, suicide, unintentional injury and death, rape, and physical assaults. Cocaine, barbiturates, phencyclidine, amphetamines, and steroids also play a role in such violence (23). In our study, the number of alcohol-substance abuse-related forensic victims was 30 (0.22%). Young adolescents dominated in the 10-19 age group, and 60% of them were male. They were usually admitted to the ED between 16:00-23:59. Victims were seen commonly in February. Two patients died in the ED due to alcohol-substance abuse (see Tables 2-7).

More than 2.4 million cases of suspected child abuse and neglect are reported each year in the US. Reported cases probably represent as little as 20% of actual abuse. Two-thirds of the victims of physical abuse are under the age of three years, and one-third are under six months (24). In our study, we recorded 24 (0.17%) victims as child abuse-neglect. Most of the victims were in 0-10 age group, including 13 males and 11 females. Ten victims were admitted to the ED between 08:00-15:59, and 11 were admitted between 16:00-23:59. The victims were mostly seen in August. Three male victims died outside the ER (see Tables 2-7).

Another responsibility of the EPs is that of notifying the local law enforcement agency or medical examiner of a death that constitutes a forensic case. This enables one to determine whether or not an autopsy is necessary. Such deaths are generally those of individuals who die suddenly while not under the immediate care of a physician (9). In our study, we recorded 17 cases (0.12%) as suspicious deaths. Five cases were in the 10-19 age group, 5 in the 50-59 age group and 4 in 40-48 age group, and 11 of them (64.71%) were male. Most of them (8 cases) were admitted in the 08:00-15:59 time interval. Three cases applied in July, and three in September. Five males and five females died in the ED, and six males and one female died outside the ED (see Tables 2-7).

Sexual assaults accounted for 5% of all violent crimes reported in the US in 1995. At least 20% of all adult women and 12% of adolescent women have experienced some form of sexual abuse or assault during their lifetime. Sexual assault is the most underreported violent crime. Some estimates are as low as 10% (25). Eight sexual assault victims were reported (two males and six females) in our ED, and five of them were under 10 years old. Half of them were admitted between 16:00-23:59, and two victims were seen in May. We did not record any deaths due to sexual assault (see Tables 2-7).

Different types of forensic issues remain a major public health problem in Turkey and throughout the world. Aggressive prevention strategies need to be focused on the population groups at excessive risk of MVT, violence, suicide, occupational injuries and other forensic issues.

Detailed epidemiological information is the basis for planning the control and prevention of disease in communities. Several studies concerning the epidemiology of major injuries have been published, but they are not always homogeneous or comparable. A main issue in the past has been the lack of clear and accepted definitions. The heterogeneity of their designs is another limitation on the accuracy and comparability of studies on trauma (26).

Wiler et al. (8) discussed the need to include CFM training in EM residency programs. Currently, attempts are being made to incorporate formal CFM training into the EM residency programs through lectures, bedside teaching and elective opportunities with the CFM team.

As long as the different types of forensic issues exist around the world, the need for CFM will also continue. EPs will face the challenges of addressing both the medical as well as forensic needs of ED patients. They should be well prepared to manage these cases effectively as well as other acute disorders.

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