

The characteristics of assaulted victims presented to a university emergency department: Can head trauma in male patients be considered a clue for assaults?

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ABSTRACT

BACKGROUND: Violence is a common issue without an exact number worldwide. The types are interpersonal, spousal, or domestic violence. We aim to reveal the demographic characteristics of cases involving violence, mechanisms of injury, and their relationship with head and face trauma.

METHODS: The files of patients presented to our University Hospital Adult Emergency Department (ED) between January 2018 and December 2020 after an assault were reviewed retrospectively. The data were analyzed with SPSS 20.0. The demographic findings, injury mechanisms, and affected areas were reported. The Chi-square test tested the differences between the groups, and $p < 0.05$ was considered significant.

RESULTS: Among the 1280 patients presented after an assault, 71% were male with a median age of 32 (IQR 25–43). In 84% of the cases, the perpetrators were unknown, while their spouses were the perpetrators in 9% of the cases. The place was most noted as home (11%). The methods used were struggling (43%) and punching (42%). The most common affected area was the head (70%) and diagnosis for nasal fracture (4%); two patients had epidural bleeding, and one had a pneumothorax. Males were more common in the 20–40 age groups (χ^2 , $p = 0.003$). Most of the female victims were battered by their spouses (χ^2 , $p < 0.001$). Head injury was found in 83% of patients with high blood alcohol levels (χ^2 , $p < 0.001$) and 75% of male patients had head injuries (χ^2 , $p < 0.001$).

CONCLUSION: Assault is a common problem predominantly among young males. The most commonly affected body part was the head, and nasal fractures were the diagnosis. Most of the patients with high blood levels were among the male victims. The perpetrator of the female victims was their spouses. In the ED, male patients who presented with head trauma were considered as assault victims.

Keywords: Demographics; head trauma; injury mechanisms; interpersonal violence.

INTRODUCTION

Violence can be explained in many ways; a significant portion of the public and health-care professionals limit violence to physical attacks. According to the World Health Organization (WHO) definition, violence can be defined as the intentional use of physical force that causes injury, death, psychological harm, and developmental delay.^[1]

All patients, including children, elders, intimate partners, and other family members, presented to the Emergency Department (ED) with any form of violence should be evaluated as family violence.^[2] Domestic violence (DV) affects one in three women worldwide, which can be defined as physical, sexual, or psychological harm based on gender.^[3] Furthermore, violence can be seen in the workplace, which is usually encountered in the form of physical and verbal at-

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tacks in emergency services, psychiatry services, and nursing homes.^[4]

Over 1.6 million people lose their lives because of violence worldwide each year. Violence is among the leading causes of death among males (14%) between the ages of 15–44 years worldwide.^[5] In a study conducted in the USA, it was reported that 95% of the head traumas were in cases that injury intent was present, two-fifths of the cases were between the ages of 25–44, and two-thirds were male.^[6]

In the literature, violence against female patients by their intimate partners is being discussed. However, our study aims to determine the demographic characteristics, injury mechanisms, and physical injuries, especially the head injuries of the adult victims who were exposed to violence and presented to the ED of a university hospital.

MATERIALS AND METHODS

This was a retrospective study conducted in the Gazi University Hospital ED with an annual patient number of 55.000. Data collection was carried out between January 2018 and December 2020. Patient data were obtained from the hospital electronic database, and the patient medical files were used for all types of violence cases. Patients aged 18 years and older presenting to ED because of a violence case that was coded W-51 according to the tenth revision of the International Classification of Diseases (ICD-10) were included in the study. The patients who were presented with cardiac arrest, stab wound, gunshot wound, and motor vehicle accident were excluded from the study.

After taking permission from the hospital archive administrator, particular forensic report files which emergency residents filled during the patient evaluation were used. Data related to the gender, age, profession, perpetrator, time, and place of the assault, the method and object used, sexual assault, presence of alcohol or illicit drug, presenting symptoms, vital signs, physical examination findings, imaging studies (e.g., plain radiographs, ultrasound, and computed tomography [CT]), final diagnosis, and hospital admission were recorded in the study charts. The physical findings were reported in detail (location and type of the wound, e.g., ecchymosis, abrasion, laceration, and fracture).

The data were analyzed using the IBM SPSS (Statistical Package for the Social Sciences) statistical software version 20.0 (IBM Corporation, Armonk, NY, USA). Normally distributed continuous variables were described as mean and standard deviation. Non-normally distributed continuous variables were described as the median and interquartile range (IQR). The differences between the groups were tested by χ^2 analysis. $P < 0.05$ was considered significant.

Ethical Considerations

The Gazi University Local Ethics Committee (2021–458).

RESULTS

Between January 2018 and December 2020, there were a total of 179.073 patient admissions to the ED. Among the 1280 patients who presented to the ED after a physical assault, 909 (71%) were male, and 812 (63%) were between the ages of 21–40. The median age of the patients was 32 years (IQR 25–43) (Fig. 1).

Of these 423 patients (33%) presented to ED between the hours of 18.00–24.00 when the perpetrator was questioned, 1078 (84%) patients were exposed to violence by unknown people, 112 (9%) by their spouses, 41 (3%) by their friends, and 38 (3%) by their relatives. When the object used during the assault was questioned, the most commonly used objects were knives (3%), metal sticks (3%), and wooden sticks (3%). Patients assaulted at home were 136 patients (11%), those at their workplace were 84 patients (7%), and in traffic, 54 patients (4%). The high blood alcohol level was measured in 192 (15%) patients. As a method, 545 (43%) patients were presented after struggling and 544 (43%) patients after being punched. Sexual assault was reported in 10 of the patients and illicit drug use in one of the patients (Table 1).

The most common presenting complaints of the patients were as follows: Headache (37%), extremity pain (32%), and chest pain (4%). As the most commonly affected parts of the body after the assault were investigated, the regions reported were the head (70%), the extremities (47%), and the trunk (chest, back, and abdomen) (30%) (Table 1).

The patients' affected facial parts according to history and complaints were as follows: The nasal area (182 patients), the maxilla (97 patients), the mandible (73 patients), the eyebrows (56 patients), and the zygoma (48 patients). The most frequent types of injury on the face were lacerations in 126, abrasion in 67, and ecchymosis in 15.

Among these patients, after the final diagnosis were evalu-

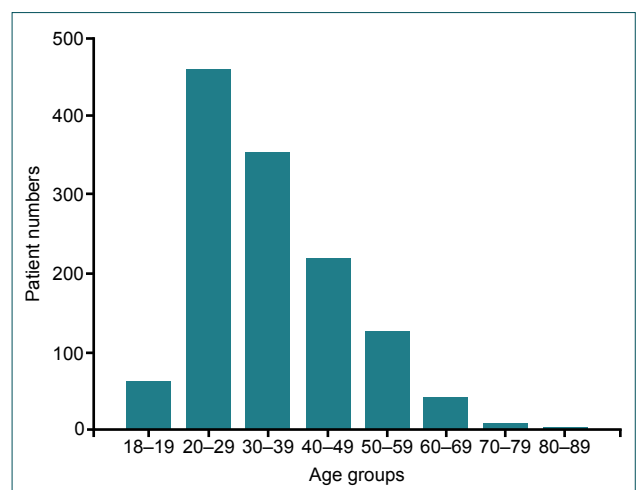


Figure 1. Distribution of cases by age groups.

Table 1. Demographic characteristics of assaulted patients presenting to emergency department

Age Median (IQR)	32 (25–43)	
	n	%
Gender		
Male	909	71
Female	371	29
Violence place		
Home	136	11
Workplace	84	7
Traffic	54	4
Violence perpetrator		
Unknown	1078	84
Spouse	112	9
Friend	41	3
Relative	38	3
Alcohol status		
No	1088	85
Yes	192	15
Types of physical violence		
Struggle	545	43
Punch	544	43
Common complaints		
Headache	468	37
Extremity pain	414	32
Chest pain	54	4
Affected body parts		
Head	823	64
Extremity	575	45
Trunk	357	30
Computed tomography		
Brain	517	40
Whole-body	69	5
x-rays		
Extremity	397	31
Chest	371	29
Pelvis	170	13
Last diagnosis		
Soft tissue trauma	495	39
Fractures	82	6
Admission to hospital		
Discharged	1167	91
Others	88	7
Admitted	25	2

ated: 48 had a nasal fracture, 11 had finger fracture, seven had incisions with the knife, seven had rib fracture, three had

Table 2. The relationship between blood alcohol levels, gender and injured areas

	Gender (n)		Alcohol (n)	
	Male	Female	Yes	No
Head trauma				
Yes	635	188	150	673
No	274	183	42	415
	p<0.001		p<0.001	
Trunk trauma				
Yes	220	100	50	270
No	389	271	142	818
	p<0.31		p<0.71	
Extremity trauma				
Yes	374	201	88	487
No	535	170	104	601
	p<0.001		p<0.81	

Chi-square, p<0.05.

mandibula fracture, three had a maxillary fracture, two had epidural bleeding, and one had a pneumothorax. In other words, 39% were diagnosed as soft-tissue trauma, 1% as lacerations, and 6% as fractures in different regions.

When radiological imagings are examined, it is seen that an extremity X-ray was obtained for 397 (31%) patients, a chest X-ray was obtained for 371 (29%) patients, a pelvis X-ray was obtained for 170 (13%) patients, and a cervical X-ray was obtained for 103 (8%) patients. In addition, a cranial CT scan was obtained for 517 (40%) patients, a whole-body CT was obtained for 69 (5%) patients, and an abdominal USG was obtained for 14 (1%) patients.

Among the 1280 patients, 1167 (91%) were discharged from the ED, and 25 (2%) patients were admitted to the hospital (13 patients to orthopedics, seven patients to plastic surgery, four patients to general surgery, one patient to neurosurgery). While the patients were discharged from the emergency room, analgesic pills were prescribed to 17% of the patients, splints/plaster was applied to 3%, and elastic bandages were applied to 1% of the patients.

There was a relationship between age groups and gender (χ^2 , p=0.003), and it was seen that males were more common in the 20–40 age groups. As the relationship of the victims and the gender of the perpetrator was investigated, it was observed that most of the women were battered by their spouses (χ^2 , p<0.001). A significant relationship was found between the injured area and alcohol. (χ^2 , p<0.001) Head injury was found in 83% of patients with high blood alcohol levels. In addition, 75% of male patients had head injuries, and a relationship was found between gender and head in-

jury (χ^2 , $p < 0.001$). Furthermore, a relationship was found between gender and extremity trauma, 41% of male patients had extremity trauma (χ^2 , $p < 0.001$). There was no relationship between trunk injuries, gender, and blood alcohol levels (Table 2).

DISCUSSION

Violence is widespread worldwide and types of violence can be defined as an interpersonal, intimate partner, and family violence. It can be perceived differently according to the cultural structures of societies, and the exact number is unknown because the victims would not report it to the judicial authorities and the hospitals. Violence creates physical, mental, and economic effects on individuals. Psychological effects were not examined in our study. The demographic characteristics of patients, injury mechanisms, and injured parts of the body, especially the head and face, were studied. In concordance with the literature in our study, the most common physically injured was male patients between the last 2 and 4 decades. Head and extremity trauma were the commonly affected areas. Female patients were perpetrated mainly by their spouses.

It has been observed that sexually and physically assaulted patients were presented to the ED more than once a year, more frequently than other patients.^[7] However, all violence-related injuries are not reported and will not require medical attention. In South Africa, a survey showed that between 50 and 80% of assaulted victims and 46% of assaulted victims received medical treatment in the USA without reporting it to the police.^[5]

The studies on violence show that the highest rates of homicide are found among males aged 15–29 years.^[5] In Spain, it was reported that 70% of the patients admitted to the ED because of violence were male, and the mean age was 28–30. Furthermore, in South Africa, it was reported that murders were most common in males between the ages of 15–29, and the male/female ratio was 7/1 in deaths.^[8] A study from Finland reported that violence-related injuries were 10–15% among adolescents annually.^[9] Consistent with the literature in our study, male patients were 71% of all, and the median age was 32.

DV is a mixed and multidimensionally evaluated event that can be considered ill-treatment against human life. Violence against women can occur at any stage of life and victims are usually unwilling to reveal their violent experiences, which makes it challenging to learn the true prevalence of intimate partner violence. Women living in low- and middle-income countries may consider DV taboo and would not report it.^[3,7,10,11]

In developed countries, physical violence among women is between 20% and 50%. DV is reported between 26.6% and

34% in the literature, and half of the women are killed by their male partners.^[8,12] In our study, female patients were 29% of all victims and 9% of the female patients were assaulted by their husband or intimate partner.

Traumatic injuries were seen in 90.6% of the patients and mental and psychosomatic diseases were observed in 9% of the patients.^[13] Traumatic brain injury resulting from assault occurs in 10% of head traumas.^[14] Head injuries (82%) and serious facial injuries (12%) were reported more common following blunt trauma among assaulted victims.^[15] Most of the assaulted victims experience a head injury at least once, and higher rates can be seen among victims assaulted by an intimate partner.^[16] In the US, approximately 1.7 million traumatic brain injury is reported every year because of falls, motor vehicle crashes, assaults, and sports-related injuries. If there is the intent of injury, the most commonly affected area is the head (95.9%), which relates to multiple perpetrators (38.0%). Nearly two-fifths of all assault-related head traumas occurred in the 25–44 year age group (38.8%), and two-thirds of assault victims were male (66.6%).^[6] The head and upper extremities were the most commonly injured areas and the most common violence among adolescent victims as physical fights.^[9] In victims experiencing multiple injuries, head-and-neck injury frequency was more significant than others.^[17] In our study, the most common injured area was the head. The final diagnosis of patients with head trauma was lacerations, soft-tissue trauma, and epidural hemorrhage in two patients. A significant relationship between head trauma and male gender was shown.

Facial fractures are associated with road traffic accidents, assaults, falls, and sports and work injuries. Interpersonal violence has become an important etiological factor. European Maxillofacial Trauma Project investigated a series of 3396 patients, and the most common cause of injury was assault with 1309 patients. Mandible was the most frequently observed fracture (1743), followed by orbital-zygomatic-maxillary fractures (1010 fractures), orbital fractures (656), and nose fractures (395). In maxillofacial trauma, male to female ratios range between 2:1 and 8:1.^[18] Nasal bone fractures are the most common facial bone fracture mainly caused by trauma. Brasileiro reported in their study that the patients with a nasal fracture are seen among victims aged between 21 and 39 years and violence was the most common cause.^[19] In our study, the nasal bone was the most affected bone in concordance with the literature. Furthermore, zygomatic, maxillary, and mandibular fractures were seen.

Abuse of drugs and alcohol is frequently associated with interpersonal violence and these patients often present to ED after an assault.^[5,15] Alcohol consumption is a significant risk factor for sexual assault among college students in the USA.^[20] Furthermore, a strong relationship was demonstrated between alcohol sales and harm in Finland.^[21] About 15% of the patients had high blood alcohol levels in our study. We had no idea about the perpetrators' alcohol status. Only one

patient declared that she took illicit drugs. We do not have a drug screening tool, so we have no idea about the patients. However, there was a significant relationship between head injury and high blood alcohol levels; the head injury was found in 83% of patients with high blood alcohol levels.

Limitations

Since the study was retrospective, there was a lack of data. In particular, there was a lack of information about the gender of the perpetrator and the place of violence. We do not have a screening tool for illicit drugs and also their effects were not evaluated. The patients presenting because of the stab wound and gunshot wound were excluded as they had different codes according to ICD-10. As the study was conducted at a university hospital, the cases were lower than the community hospitals.

Conclusion

Violence is a common problem in our country as in the rest of the world. The majority of post-violent injuries and ED admissions are seen among males. Most of the female victims were perpetrated by their spouses. The most common injuries were in the head and extremities. Although we have no idea about the perpetrators' alcohol status, the victims with high blood alcohol levels and head trauma showed a significant relationship. Most of the patients were discharged with the diagnosis of soft-tissue trauma, but serious diagnoses such as pneumothorax and epidural hemorrhage were also diagnosed after assaults. In the emergency setting, the male patients with head trauma would be evaluated with suspicion and considered the victims of an assault.

Ethics Committee Approval: This study was approved by the Gazi University Ethics Committee (Date: 26.04.2021, Decision No: 2021-458).

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ORJİNAL ÇALIŞMA - ÖZ

Bir üniversite acil servisine başvuran darp olgularının özellikleri: Erkek hastalarda kafa travması darp için bir ipucu sayılabilir mi?

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AMAÇ: Şiddet tüm dünyada kesin olgu sayısı bilinmeyen yaygın bir sorundur. Kişilerarası, eş veya aile içi şiddet şeklinde tipleri vardır. Çalışmamızda şiddet içeren olguların demografik özelliklerini, yaralanma mekanizmalarını ve kafa ve yüz travması ile ilişkisini ortaya koymayı amaçlıyoruz.

GEREÇ VE YÖNTEM: Ocak 2018–Aralık 2020 tarihleri arasında üniversite hastanemiz erişkin acil servisine (AS) darp edilerek başvuran hastaların dosyaları geriye dönük olarak incelendi. Veriler SPSS 20.0 ile analiz edildi. Demografik bulgular, yaralanma mekanizmaları ve etkilenen alanlar kaydedildi. Ki-kare testi gruplar arasındaki farklılıkları test etti ve $p<0.05$ anlamlı kabul edildi.

BULGULAR: Darp edilerek başvuran 1280 hastanın %71'i erkekti ve medyan yaşı 32 (IQR 25–43) idi. Olguların %84'ünde darp eden bilinmeyen kişiler, %9'unda darp eden eşleri olmuştur. En çok darp edilen alan ev olarak belirtildi (%11). Kullanılan yöntemler, boğuşma (%43) ve yumruk atma (%42) idi. En sık etkilenen bölge baş (%70) ve en sık tanı burun kırığı (%4) idi; iki hastada epidural kanama, bir hastada pnömotoraks saptandı. Erkekler en sık 20–40 yaş grubundaydı (χ^2 , $p=0.003$). Kadın mağdurların çoğu eşleri tarafından dövülmüştü (χ^2 , $p<0.001$). Kan alkol düzeyi yüksek olan hastaların %83'ünde kafa travması (χ^2 , $p<0.001$) ve erkek hastaların %75'inde kafa travması (χ^2 , $p<0.001$) bulundu.

TARTIŞMA: Saldırı, ağırlıklı olarak genç erkekler arasında yaygın bir sorundur. En sık etkilenen vücut kısmı baş ve en sık tanı burun kırıklarıydı. Kan alkol seviyeleri yüksek olan hastaların çoğu erkek kurbanlar arasındaydı. Kadın kurbanları darp edenler eşleriydi. Acil servise kafa travması ile başvuran erkek hastalar saldırı mağduru olarak değerlendirildi.

Anahtar sözcükler: Demografik özellikler; kafa travması; kişilerarası şiddet; yaralanma mekanizması.

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