KESİCİ-DELİCİ ALET YARALANMASI İLE İLİŞKİLİ SALDIRILARIN ANALİZİ: MANİSA'DA ON YILLIK DENEYİM*

Analysis of the assaults associated with stab wounds: ten-year-experience in Manisa*

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ÖZET

Kişilerarası şiddet ile ilişkili olarak kesici-delici alet yaraları halen dünyanın pek çok ülkesinde başlıca problemlerden biri olarak kabul edilmesine rağmen, Türkiye'de sıklığı henüz belirlenmemiştir. Bu çalışmanın amaçları; kesici-delici alet yaralanmaları ile ilişkili saldırıların, mağdur ve faillerin analizini yapmak; daha önce yayımlanmış veriler ile karşılaştırmak ve Türkiye için uygun önlemleri tanımlamaktır ve bu amaçla 238 kesici-delici alet saldırısı olgusu, 2002 ve 2012 arasında Celal Bayar Üniversitesi Hastanesi Adli Tıp Polikliniği'nde değerlendirilmiştir. Mağdurların ve saldırganların çoğu erkekti (%94.5; %96.5)ve 20-39 yaş aralığında idi (%60.1; %67.3). Kesici-delici alet yaralarının büyük bölümü bıçak ve çakılar ile oluşturulmuştu (%81). Saldırılar çoğunlukla caddelerde (%40.3) ve halka açık alanlarda (%36.2) ve gece saatlerinde (%31.1) meydana gelmişti. Yaralanmaların çoğu yumuşak doku yaralanmaları (%73.8) idi ve genellikle intratorasik organlar ve/veya damarlar (%40.8) etkilenmişti. Mağdurların %37,4'ü yaşamsal tehlikeye, %21'i çeşitli sekellere maruz kalmıştı.

Suç önleme çabaları bağlamında, kesici-delici alet ile saldırıların gerçek çözümünde; eğitsel, sosyo-kültürel ve ekonomik çabaların yanı sıra; bıçak taşımaya karşı mevzuatın yürürlüğe konulması ve özellikle geceleri olmak üzere sokaklarda ve kamuya açık yerlerde polis denetimlerinin arttırılması önem taşımaktadır.

Anahtar kelimeler: Şiddet, yaralar, bıçak, suç, adli tıp

SUMMARY

Although stab wounds associated with interpersonal violence are accepted as one of major problems in many countries, their incidence in Turkey has not been determined yet. The aims of this study were: to analyze the incidents associated with stab wounds and features of victims and offenders; to compare with previously reported data; and to identify preventive measures appropriate for Turkey. Two hundred and thirty eight cases of assault by stab were evaluated in Forensic Medicine Outpatient Clinic of Celal Bayar University Hospital between 2002 and 2012. Most of the victims and offenders were males (94.5%; 96.5%, respectively) aged between 20-39 years (60.1%; 67.3%, respectively). Most of stab wounds were inflicted by knives/penknives (81%). Assaults mostly occurred on streets (40.3%) and public areas (36.2%) and during night hours (31.1%). Most of the injuries were soft tissue injuries (73.8%) and the most commonly affected structures were intrathoracic organs and/or vessels (40.8%). Of the victims 37.4% were exposed to life-threatening acts, while 21% of them sustained various sequels.

The actual solution of assaults associated with stab wounds in the control of crime prevention involves

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educational, socio-cultural and economic efforts; enforcing the legislations against carrying knives and increasing police controls in streets and public places, especially in nights.

Key words: Violence, wounds, stab, crime, forensic medicine

Introduction

In many societies, the interpersonal violence is considered as part of daily life, a natural way of expressing oneself and a method for solving the problems (1). Every year, thousands of people all over the world are injured as a result of acts of interpersonal violence, and interpersonal violence constitutes to be a major public health problem in many countries (2,3). Although various measures have been experimented for years, crimes associated with knives and other sharp instruments are "persistent and raising concerns" (4). Knives and sharp instruments have been reported to be most common criminal tools, responsible of about one-third of all murders and serious injuries and knives were used in 36% percent of all homicides in the years of 2010 and 2011 (4-6). Studies from Turkey showed that 8% of all deaths were caused by stab wounds (7); the frequency of stab wound related cases varied between 3.1% and 18% among all medico-legal cases (8-11), comprising 33.4% of non-sexual assault cases (12); the rate of patients injured stabs between 21.1% and 58.9% among patients with thoracic trauma (13-16), and 70% in patients with penetrating abdominal injuries (17). However, the exact number of crimes associated with stab attacks is impossible to know due to the unreported cases (5,6,18). To define the preventive measures, data from several clinics of several countries is collected to establish the prevalence and frequency of assaults associated with stab wounds. The aims of this study were to compare of the results of this study with data from other countries and other studies from Turkey; and finally to identify preventive measures appropriate for Turkey, by carrying out a retrospective, comparative, and comprehensive analysis of assaults associated with stab wounds, their victims and offenders;.

Material and method

Two-hundred and thirty eight cases of assaults associated with stab wounds referred to Forensic Medicine Outpatient Clinic of Celal Bayar University Hospital (Manisa, Turkey) were reviewed retrospectively. A total of 2,488 medico-legal reports issued in the outpatient clinic between July 1, 2002 and June 30, 2012 were reviewed. July 1, 2002 was the day our outpatient clinic was founded. While expressing our results, 2002-2003 was used to define the time interval between July 1 of 2002 and June 30 of 2003. Detailed information about features of victims of stab wound, crime scenes and suspects were obtained from statements of the victims, suspects and witnesses, crime scene investigation reports, court transcripts and hospital records. Data were analyzed in eight group in the results with regard to (1) the time during which the assaults took place including year, season, month and hour; (2) the features of the victims including gender, age, and consumption of alcohol; (3) to the crime scenes and the number of offenders in each assault; (4) the features of the offenders including gender, age, consumption of alcohol, and relationship between offender and victim; (5) the features of stab wounds including "the number of stab wounds per victim" and "the distribution of the crime tools in each one of the 637 stab wounds"; (6) body region where the injury was sustained; (7) severity of injury; and (8) the medico-legal evaluation of the victims with stab wounds. Attempted suicide with stabs cases and accidental stab wounds were not included in this study. Data were statistically analyzed by Chi-square test. Level of significance was $p \leq 0.05$.

Results

The distribution of stab wounds according to the time during which the assaults took place: Two-hundred and thirty eight assault cases injured with stabs presented to our outpatient clinic during the study period. This comprised 9.6% of all medico-legal cases (n:2,488). Most of the cases (n:47; 19.8%) were referred to our clinic between 2007 and 2008 (Table 1). When the incidence of assaults associated with stab wounds that were referred to our clinic were examined, we found that 2006-2007 was the period when highest number of cases was referred and 18.1% of all medico-legal cases were assault associated with stab wound (Table 1). The assaults with stabs made a peak during autumn (n:87; 36.6%), especially in October (n:39; 16.4%), followed by November (n:29; 12.2%) and May (n:29; 12.2%) (Table 1). There was a trend increase in the number of assaults with stabs after midday, reaching a peak between 8 pm and midnight (n:74; 31.1%) (Table 1).

Table-1: The distribution of stab wounds according to the time during which the assaults took place.

The distribution of stab wounds according to years (p<0.05)			
Years	**a, (n=238)**	**b, %**	**c, %**
2002-2003	5	2,1	7,1
2003-2004	11	4,6	4,2
2004-2005	15	6,3	6,2
2005-2006	23	9,7	10,5
2006-2007	36	15,1	18,1
2007-2008	47	19,8	10,8
2008-2009	33	13,9	8,6
2009-2010	44	18,5	13,3
2010-2011	17	7,1	8,0
2011-2012	7	2,9	5,3

The distribution of stab wounds according to the time (p<0.05)		
Time period	**a, (n=238)**	**b, %**
Midnight-03:59 am	26	10,9
04:00 am-07:59 am	12	5,0
08:00 am- Midday	22	9,2
Midday-03:59 pm	39	16,5
04:00 pm-07:59 pm	65	27,3
08:00pm- Midnight	74	31,1

The distribution of stab wounds according to seasons (p<0.05)		
Seasons	**a, (n=238)**	**b, %**
Winter	52	21,8
Spring	52	21,8
Summer	47	19,8
Autumn	87	36,6

The distribution of stab wounds according to months (p<0.05)		
Months	**a, (n=238)**	**b, %**
January	24	10,1
February	12	5,0
March	8	3,4
April	15	6,3
May	29	12,2
June	18	7,6
July	13	5,5
August	16	6,7
September	19	7,9
October	39	16,4
November	29	12,2
December	16	6,7

(a) number of stab wounds; (b) percentage of stab wounds; (c) stab wound rate per all medico-legal cases per year.

Features of the victims

Out of 238 victims, 94.5% (n:225) were males and 5.5% (n:13) were females (Table 2). Mean ages were 30.4±11.3 years (range: 9-63; median: 29) for all victims, 30.5±11.5 years (range: 9-63; median: 29) for male victims and 28.6±7.7 years (range: 17-42; median: 30) for female victims. More than half of the victims (n:143; 60.1%) were aged between 20 and 39 years (Table 2). Data on the victims' breath or blood alcohol levels were available in 202 cases. Out of these 202 cases, alcohol consumption was

Table-2: Features of the victims.

The distribution of victims according to age groups and genders (p<0.05 according to total number of victims in each age group; p<0.05 according to total number of victims in each gender)						
Age groups	**Males**		**Females**		**Total**	
	(n=225)	**(%)**	**(n=13)**	**(%)**	**(n=238)**	**(%)**
≥ 19	46	20.4	1	7.7	47	19.7
20-29	72	32.0	5	38.5	77	32.4
30-39	60	26.7	6	46.1	66	27.7
40-49	30	13.3	1	7.7	31	13.0
50-59	13	5.8	0	0	13	5.5
60≤	4	1.8	0	0	4	1.7

The distribution of victims according to breath (or blood) alcohol level (p<0.05)		
Breath (or blood) alcohol level	**Number of victims* (n=202)**	**Percentage of victims**
Zero	128	63.4
Under 1g/l	47	23.3
1 g/l – 2g/l	21	10.4
2g/l – 3g/l	4	2.0
More than 3g/l	2	0.9

(*) 32 victims who were unknown of alcohol concentration were not included in the table.

confirmed by breath or blood analyses in 74 (36.6%) cases. Alcohol level in victims is shown in Table 2.

The distribution of assaults according to the crime scenes and the number of offenders in each assault

Most of the assaults (n:96; 40.3%) occurred in the streets. The second most frequent scene of assault (n:86; 36.2%) was public areas including coffee houses, tea gardens, pubs, restaurants, schools, shops, bazaars, hospitals, mass-transportation vehicles and wedding rooms. In this study, victims' or their relatives' homes and areas surrounding homes like gardens, car parks and inside the apartment buildings were classified as "home and its vicinity"; victims' work places and areas surrounding homes like gardens and car parks were classified as "work place and its vicinity" (Table 3). In 45 assault cases (18.9%), the offenders could not be identified by the police officers. There were 315 offenders in 193 stab related assaults. Most of the victims (n:128; 66.3%) was assaulted by a single offender. The number of offenders in each assault case is shown in Table 3.

Features of the offenders

Out of 315 offenders, 304 (96.5%) were males and 11 (3.5%) were females (Table 4). Mean ages were 31.1±10.3 years (range: 11-64 years; median: 29) for all offenders, 31±10.2 years (range: 11-64 years; median: 29) for male offenders and 34.1±12.6 years (range: 16-52 years; median: 30.5) for female offenders. Majority of the offenders (n=212; 67.3%) were aged between 20 and 39 years (Table 4). Data on the offenders' alcohol consumption was gathered from the court files and police records. In 105 (33.3%) of these records, there was not any information about alcohol consumption or quantitative values about alcohol concentrations of the offenders. The ratio of the offenders who consumed alcohol during the incident was found to be 62.4% (n:131) among the offenders whose breath or blood alcohol concentration was determined (n:210; 66.7%) (Table 4). While 177 (56.2%) offenders were known by the victims before the event, 138 (43.8%) of them were strangers (Table 4).

Features of the stab wounds

There were a total of 637 stab wounds in 238 victims, 49 of which was sustained by females and 588 by males. The ratios of stab wounds per each victim were calculated to be 2.7 for all victims, 3.8 for females and 2.6 for males. The ratio of victims with a single stab wound was found to be 43.3% (n:103). Maximum number of stab wounds in one victim was 21. The distribution of stab wounds per each victim is shown in detail in Table 5. The majority of stab wounds was inflicted by knives or penknives (n:516; 81%) (Table 5).

Additionally, blunt injuries accompanied by stab wounds were observed in 37 (15.5%) victims. Blunt injuries were not included in this study.

Table-3: The distribution of assaults according to the crime scenes and the number of offenders in each assault.

The distribution of assaults according to crime scenes (p<0.05)			
Crime Scene		**Number of assaults (n=238)**	**Percentage of assaults**
Streets		96	40.3
Public areas		86	36.2
Home and its vicinity		41	17.2
Work place and its vicinity		15	6.3
Number of offenders in each assault (p<0.05)			
Number of offenders per each assault	**Number of assaults* (n=193)**	**Percentage of assaults**	**Number of offenders (n=315)**
One	128	66.3	128
Two	36	18.7	72
Three	15	7.8	45
Four	10	5.2	40
Five and more	4**	2.0	30**

(*) 45 assaults which had unidentified offenders were not included in the table.
(**) There were 5 offenders in one assault, 6 offenders in one assault, 8 offenders in one assault and 11 offenders in one assault.

Table-4: Features of the offenders.

The distribution of offenders according to age groups and genders (p<0.05 according to total number of offenders in each age group; p<0.05 according to total number of offenders in each gender)						
Age groups	Males		Females		Total	
	(n=304)	(%)	(n=11)	(%)	(n=315)	(%)
≤19	35	11.5	2	18.2	37	11.7
20-29	122	40.1	2	18.2	124	39.4
30-39	86	28.3	2	18.2	88	27.9
40-49	44	14.5	3	27.2	47	14.9
50-59	14	4.6	2	18.2	16	5.1
60≤	3	1.0	0	0	3	1.0

The distribution of offenders according to breath (or blood) alcohol level (p<0.05)		
Breath (or blood) alcohol level	Number of offenders* (n=210)	Percentage of offenders
Zero	79	37.6
Under 1g/l	54	25.7
1 g/l – 2g/l	51	24.3
2g/l – 3g/l	17	8.1
More than 3g/l	9	4.3

The relationship between offenders and victims (p<0.05)		
The relationship between offenders and victims	Number of offenders (n=315)	Percentage of offenders
Strangers	138	43.8
Acquaintances	89	28.3
Neighbors	24	7.6
Friends/Colleagues	19	6.0
Spouses	15	4.8
Siblings	7	2.2
Descents	4	1.3
Parents	2	0.6
Other relatives	17	5.4

(*) 105 offenders who were unknown of alcohol intake were not included in the table.

The distribution of stab wounds according to the location of the injury

The region where the most severe stab wound was taken as the "injury location" when there were stab wounds involving more than one region. The order of frequency of the locations of the stab wounds was thoracic region (n:147; 23.1%), face, head and neck regions (n=137; 21.5%), abdominal, genital and anal regions (n:131; 20.5%), upper limbs (n=124; 19.5%), and lower limbs (n=98; 15.4%). Detailed distribution of stab wounds according to the locations is shown in Table 6.

Additionally eighty-six stab wounds (72%) on the upper limbs in 66 victims were considered to be defense wounds. The ratio of victims who had defense wounds among all was 27.7%.

The distribution of stab wounds according to the severity of injury

Soft tissue-only injuries constituted the majority of stab wounds (n:470; 73.8%); followed by internal organ and/or main vessel injuries (n:157; 24.6%), and bone lesions (n:10; 1.6%) (p<0.05). Among all injured internal organs and/or main vessels; the intrathoracic organs and/or main vessels (n:64; 40.8% of all stab wounds associated with organ and/or main vessel injuries), and intraabdominal organs and/or main vessel injuries (n:55; 35% of all stab wounds associated with organ and/or main vessel injuries) were most frequently affected from stab wounds (p<0.05). At this stage of the study; the ratio of each one of the organ and main vessel injuries was not evaluated. However, there were multiple organ and/or main vessel injuries in 43.3%

Table-5: Features of stab wounds.

The number of stab wounds per each victim (p<0.05)			
Number of stab wounds in each victim	**Number of victims (n=238)**	**Percentage of victims**	**Number of stab wounds (n=637)**
1	103	43.3	103
2-5	114	47.9	333
6-10	15	6.3	116
11 ≥	6	2.5	85
The distribution of crime tools per each one of 637 stab wounds (p<0.05)			
Crime tools		**Number of stab wounds (n=637)**	**Percentage of stab wounds**
Kitchen knife or penknife		516	81.0
Broken bottle or glass		57	8.9
Garden scissor or a garden rake		23	3.6
Falcata*		13	2.0
Chopping knife		10	1.6
Box cutter		9	1.4
Razor blade		8	1.3
Bayonet		1	0.2

(*) Falcata -a kind of machete with a one-edged blade that pitches forward towards the point, the edge being concave on the lower part, but convex on top [12].

Table-6: The distribution of stab wounds according to the locations of the injury.

(According to main titles of locations, p<0.05)		
Locations of stab wounds	**Number of stab wounds (n=637)**	**Percentage of stab wounds (*)**
Thoracic Region	**147**	**23.1**
Front and side walls of thorax	95	
Back wall of thorax	52	
Face & Head & Neck Regions	**137**	**21.5**
Face	91	
Head	16	
Neck and nape	30	
Abdominal& Genital & Anal Regions	**131**	**20.5**
Abdominal region	72	
Lumbar region	19	
Genital region	2	
Buttocks and anus	38	
Upper Limbs	**124**	**19.5**
Arms	45	
Forearms	24	
Hands	55	
Lower Limbs	**98**	**15.4**
Femoral regions	81	
Shanks	17	
Feet	0	

(*) The percentages were calculated according to main titles of locations

(n=68) of stab wounds associated with organ and/or main vessel injuries (Table 7).

The medico-legal evaluation of the victims with stab wounds

Medico-legal evaluations of the victims were made according to Turkish Penal Code. The act of intentional injury is defined in articles 86/1, 86/2, 87 and 88 of Turkish Penal Code (http://www.tbmm.gov.tr/kanunlar/k5237.html). In article 86/1, intentional injury with severity level of "cannot be cured by a simple medical treatment" is described. In article 86/2, aggravating factors of crime are defined and assaults with weapon are amongst them. Article 87 is associated with the major form of this crime that it includes severe injuries such as "exposing to a

Table-7: The distribution of stab wounds according to severity level of the injury.

Severity levels of stab wounds	Number of stab wounds (n=637)	Percentage of stab wounds (*)
Thoracic Regions	**147**	**100.0**
Only soft tissue injuries	79	53.7
Costal cuts	4	2.7
Intrathoracic organ and/or main vessel injuries	64	43.6
Face & Head & Neck	**137**	**100.0**
Only soft tissue injuries	128	93.4
Cranial/facial/cervical main vessel injuries	9	6.6
Abdominal & Genital & Anal Regions	**131**	**100.0**
Only soft tissue injuries	76	58.0
Intraabdominal/genital/anal organ and/or main vessel injuries	55	42.0
Upper Limbs	**124**	**100.0**
Only soft tissue injuries	109	87.9
Phalanx cuts	6	4.8
Injuries of main vessels of upper limbs	9	7.3
Lower Limbs	**98**	**100.0**
Only soft tissue injuries	78	79.6
Injuries of main vessels of lower limbs	20	20.4

(*) Percentage was calculated according to subtitles under each main title.

Table-8: The medico-legal evaluation of the victims.

Status being cured by a simple medical treatment	Number of victims (n=238)	Percentage of victims
Victims can be cured by a simple medical treatment	146	61.3
Victims cannot be cured by a simple medical treatment	92	38.7
Status of exposure to a situation which endangers a person's life	**Number of victims (n=238)**	**Percentage of victims**
Victims exposed to a situation which endangers a person's life	89	37.4
Victims were not exposed to situation which endangers a person's life	149	62.6
Other status	**Number of victims (n=238)**	**Percentage of victims (*)**
Victims exposed to an act which causes a distinct and permanent scar on the face	28	11.8
Victims exposed to an act results in the permanent impairment of the functioning of any one of the senses or organs of the victim	10	4.2
Victims exposed to an act results in the complete loss of functioning of one of the senses or organs	2	0.8
Victims' body functions mildly affected from fracture or dislocation of a bone	10	4.2

(*) Percentage were calculated for the rate of only positive cases to all victims.

situation which endangers a person's life", "exposing to a distinct and permanent scar on the face or permanent disfigurement on the face", "exposing to permanent impairment of the functioning of any one of the senses or organs", "exposing to complete loss of functioning of one of the senses or organs", "body functions mildly affected from fracture or dislocation of a bone", etc. In article 88, mitigating factors of crime including "can be cured by a simple medical treatment" were defined.

The ratio of the stab wounds with a severity level of "cannot be cured by a simple medical treatment", was 38.7% (n=92). The victims were most frequently exposed to a situation which endangers a person's life (n=89; 37.4%). In this series, there was not permanent disfigurement on the face. The frequencies of other status associated with medico-legal evaluation of stab wounds are shown in Table 8. No data was available as to whether any victims died as a result of stab wounds after the assault.

Discussion

As of December 31, 2010; the population of central Manisa was 364,547, or 1,379,484 with neighboring districts, according to the census data of Turkish Statistical Institute. (http://tuikapp.tuik.gov.tr/adnksdagitapp/adnks.zul). The number of nonsexual assault offenders who received prison term was 198 (14.4 per 100,000 population) in Manisa in 2010 (19). Asirdizer et al reported that (12), 33.4% of all nonsexual assaults in Manisa were associated with sharp force injuries. Thus, the incidence of convicts who received prison term as a result of assault by stab was calculated as 4.8 per 100,000 population in Manisa. The incidence of assaults associated with stab wounds in Turkey has not been determined yet. On the other hand, number of victims assaulted by stab in Manisa and the number of offenders caught by law-enforcement officers of Manisa could not be obtained. The incidence of stab wounds was reported to be 2.1 per 100,000 population in Sweden (1987-1994) (3), 14 per 100,000 population in Cardiff (1991, Wales) (20), 33 per 100,000 population in Limerick (2001, Ireland) (21), 62.7 per 100,000 population in London (2011, England) (5). The differences of the incidence of stab wounds may be explained with regional and territorial differences, time periods of study, and methods of assessment.

In the present study, mean ratio of assaults associated with stab wounds among all medico-legal cases who presented to our outpatient clinic during the 10 year-period was found to be 9.6% (ranging between 4.2% and 18.1% according to years, $p<0.05$) (Table-1). This ratio is in agreement other studies from Turkey which reported a ratio between 3.1-18% (8-11). Schmidt reported that, 10-20% of the total annual number of clinical forensic examinations was associated with stab wounds; and stab wounds were considered as the second most common cause of injuries following blunt traumas (22). However, the ratio of stab wounds is higher among homicide victims. It was reported that 33-39.2% of homicides involved stab wounds (23,24). In the present study, majority of the victims (19.8%) presented to our outpatient clinic in 2007-2008 (Table 1). Similarly, the number of convicts who received prison term due to assault made a peak in 2007 (19).

Violent incidents show a significant variation with regard to seasons and months (25-29). In the present study, the stab related assaults made a peak in autumn months (36.6%), especially in October (16.4%), followed by November (12.2%) and May (12.2%) ($p<0.05$) (Table 1). It was reported that the stab related homicides mostly occurred in autumn and spring seasons in Turkey (25,26); the frequency curve of assaults showed one significant peak in May through June and another significant peak in October through November in Norway (27); homicides reached maximum in August in the United States (28); while sexual assaults increased in November and was rare in June in Chile (29).

It was reported that most of assaults occur at night hours (30). We found that the stab related assaults reached a peak between 8 pm and midnight (31.1%) ($p<0.05$) (Table-1). In previous studies it was reported that time the greatest risk for stab related assaults was between 10 pm and 8am (21), and between midnight and 3 am (31) and the difference can be explained by the nightlife in the region where the study carried out.

Out of 238 victims with stab wound, 94.5% were males and 5.5% were females ($p<0.05$) (Table-2). In two studies by Boström et al. (3) and Caglayan et al. (17), the ratio of stab wounds were reported to be 85% in males, and 15% in females. There is a male domination in the ratio of stab wounds, with 88% in the study of Shabbir et al. (21), and 96.3% in the study of Asirdizer et al. (12). Furthermore, the ratio of male homicide victims related to stabbing ranges

between 65% and 85% in the literature (24,32-34). The dominance of male gender in assaults was explained by susceptibility to the trauma as a result of higher activity in line with their role in social life and their genetically and hormonally structures (35).

Mean age of the victims was 30.4 years (range: 9-63 years). It was reported as 34 (range: 1-88 years) by Boström et al. in Sweden (3), 26 (range: 16-50 years) by Shabbir et al. in Ireland (21), and 33.5 (range: 17-58 years) by Schmidt et al. in Germany (22). In this study, more than half of the victims (60.1%) were between 20 and 39 years of age ($p<0.05$) (Table-2). However, in three studies from Turkey (26,33,34), the ratios of homicide victims associated with stab wounds were 37% in the 11-20 age group, 39.5% in the 26-40 age group, and 67.2% in the 20-39 age group. In other three studies from the Scandinavian countries (including Norway and Denmark), Scotland and Australia (24,30,32), the highest risk for assault was in the 20-50, 25-29 and 15-24 years age groups, respectively.

Alcohol has been defined as the primary factor for violence, especially in midnight assaults (30,31). In various studies, the ratio of intoxicated individuals who became victim of assault and homicide varies between 23% and 85% (21,24,30,34,36). In agreement with the results of above mentioned studies; alcohol intake was noted in 36.6% of victims, detected by breath or blood analysis. At least 36.5% of them were excessively intoxicated ($p<0.05$) (Table-2).

Streets have been defined as the most dangerous areas for assaults, especially for males; and most assaults occurred in streets (6,30,36). Brisco et al. reported that the majority of assaults occurred in licensed premises such as hotels, night-clubs, restaurants, etc (31). In the present study, most assaults occurred in the streets (40.3%), followed by public areas (36.2%) including coffee houses, tea gardens, pubs, restaurants, schools, shops, bazaars, hospitals, mass-transportation vehicles and wedding rooms ($p<0.05$) (Table-3). Bostrom et al. pointed out the role of sharp instruments in homicides and emphasized the necessity of legislation against carrying knives in public places to prevent "street violence" (3).

Three-hundred and fifteen offenders could be identified in 193 stab related assaults and victims were mostly assaulted by a single offender (66.3%) ($p<0.05$) (Table-3). However, it has been reported that in 81% of assaults, and 88.5% of homicides, there was only one offender (38,39).

In the present study, not surprisingly and lending support to above mentioned dominance for male victims, most of the offenders were males (96.5%). This ratio ranged between 85% and 96.8% in previous studies (12,22,24,31).

Mean age was 31.1±10.3 years (range: 11-64; median: 29) of all offenders. When the mean ages of male offenders and male victims, and mean ages of female offenders and female victims were compared, mean age of the female offenders (34.1 years) was significantly higher than that of the female victims (28.6 years). It was even higher than that of the male offenders (31 years) whilst the mean age of female victims was lower than the mean age of male victims (30.5 years). The majority of all offenders (67.3%) were aged between 20 and 39 years ($p<0.05$) (Table-4). However, in a recent study from Turkey (12), the ratio of nonsexual assault victims in the 21-40 age group was reported as 56% for all assaults and 56.5% for assaults associated with sharp force injuries.

Data on the offenders' alcohol consumption were gathered from court files and police records in 210 offenders, 62.4% of who were intoxicated ($p<0.05$) (Table-4). The relationship between assault and offenders' alcohol consumption is well-recognized and the ratio of intoxicated offenders varies between 13% and 78% (22,40-43).

Asirdizer and Yavuz reported that the relationship between victims and offenders had attracted scientific interest; however, studies had yielded conflicting results about this relationship (12). Ranging between 0% and 80%, there is a wide variation in the ratio of offenders not related to the victim (12,22,23,36,40,43-45). In the present study, whilst 56.2% of the offenders were known by the victims before the assault, 43.8% of them were strangers ($p<0.05$) (Table 4).

It has been reported that the ratio of a single stab wound in homicide cases was in the range of 28.1% and 43.7% (25,43). This ratio was 66.6% in surviving victims (46). Kompus reported that there were 1–5 injuries in 63.4% of victims and 10 and more injuries in 31.0% of victims (38). The ratio of victims with a single stab wound was found to be 43.3% ; while, the ratio of 1-5 injuries and 10 and more injuries were 91.2% and 2.5%, respectively in the present study ($p<0.05$) (Table-5). Mean number of stab wounds has been reported to be 20.1 (min: 1, max: 120) by Hagelstam and Häkkänen (40) and 2.5 (min: 1, max: 21) by Asirdizer

and Yavuz (12). The ratios of stab wounds per each victim were calculated to be 2.7 (min: 1, max: 21) for all victims, 3.8 for females and 2.6 for males in our study. Rodge et al. reported that, injury was limited to one region only in 45% of the male victims and 18% of female victims (24).

In the literature, kitchen knives and penknives are the most frequently used assault instruments (3,12,24,45). Sheaths, stilettos, bayonets, broken glass, scissors, razor blades, axes, screwdrivers, chopping knives, and box cutters are other instruments used in sharp force violence (12,24,47). In this study, majority of stab wounds (81%) was inflicted by several types of knives and penknives ($p< 0.05$) (Table 5).

In this study, the stab wounds were localized on thoracic region (23.1%), face, head and neck regions (21.5%), and abdominal, genital and anal regions (20.5%). The upper limbs (19.5%), and the lower limbs (15.4%) were relatively less frequently affected ($p<0.05$) (Table 6). However, this order was reported by Boström et al.(3), as thoracic (29%), abdominal (21%), head/neck (16%) and extremity (15%) injuries; and as thoracic (45.9%), head/neck (30.6%), lower limbs (6.1%) by Schmidt at al. (22). Further, thorax was reported as the region most frequently affected in other studies as well (24,25,34). Tumer et al. (46) reported that stab wounds on the limbs were more common among patients treated as outpatients, whilst thoracic stab wounds were the most common among hospitalized patients. In the present study, we found that there were defense wounds in 27.7% of all victims. Defense wounds were reported in 20.5% to 49% of the victims in previous studies (22,24,47).

The majority of stab wounds were soft tissue injuries (73.8%); followed by internal organ and/or main vessel injuries (24.6%), and bone lesions (1.6%) ($p<0.05$) (Table 7). Thorax (40.8%) and abdomen (35%) were the regions that were most frequently affected during injuries of organs and/or main vessels ($p<0.05$). However the ratio of severe penetrating injuries of the thorax and abdomen (54.6%) in the study of Schmidt and Pollak (47) was higher than our ratio. This ratio was found to be 18.5% by Tumer et al. (46). In an autopsy study by Erkol et al. (25), the authors reported intrathoracic and intraabdominal organs being the most common injured regions in stab wounds. In the present study, there were multiple organ and/or main vessel injuries in 43.3% of stab wounds associated with organ and/or main vessel injuries. However, multiple organ injuries were reported in 67.2% of victims with penetrating abdominal trauma (17).

Medico-legal evaluations of the victims revealed that the severity level of the injury was “cannot be cured by a simple medical treatment” in 38.7% of the victims, while 37.4% of them were exposed to a situation which endangers a person's life, and 21% of them sustained various sequels including a distinct and permanent scar on the face, permanent impairment of the functioning or complete loss of functioning of one of the senses or organs”. In the study of Ulucay et al. (35), the ratios of injury that “cannot be cured by a simple medical treatment”, “a situation which endangers a person's life”, “sustaining various sequels” in all medico-legal cases were 69.6%, 30%, 22.1%, respectively. The high ratio for exposure to life-threatening acts in our study lends support to the argument that “stab wounds are the most dangerous type of injuries for human life” (46).

Conclusion

Assaults resulting in stab wounds continue to pose a great risk for public health, especially in males and under the age of 40 years in Turkey as well as in other countries. This risk is not exclusive to the victims, since they are the ones who sustain life threatening injuries; offenders, usually young people can ruin their lives when they receive a prison term. The majority of stab wounds were inflicted by knife and penknife, mostly in streets and public areas and usually during night hours. This shows that, knives and pocket knives are often carried on oneself whilst out in the streets and public areas. This is especially true for Turkey where many youngster carry knives/penknives hidden beneath waist belts, in back pockets and socks since there is no law against carrying these outside.

In conclusion, there is no doubt that prompt and accurate medical approach to stab wounds is critical especially for those localized to thoracic and abdominal regions due to life threatening situations and possible sequels. However prevention of such injuries is equally important. By implementing legislations against carrying the knives/penknives and increasing police controls in streets and public places, especially during night hours could prevent most of the injuries in short term. Otherwise, it is not difficult to foresee that assaults associated with stabs will continue in Turkey in the future.

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