ORIGINAL ARTICLE

Pattern of firearm injuries in head and neck regions at a tertiary care hospital

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Abstract

Objective: To determine the characteristics of firearm injuries on head and neck in patients presenting to the Ear Nose and Throat Department of a tertiary care hospital.

Methods: This prospective, cross-sectional study was conducted at the Lady Reading Hospital, Peshawar, from June 2014 to May 2015, and comprised victims of firearm injuries. They were subjected to a thorough examination of the wounds specifically and the rest of the Ear, Nose and Throat, Head and Neck regions generally. Data was collected on a proforma. SPSS 16 was used for data analysis.

Results: Out of the 56 patients, 49(87.5%) were men. The overall mean age was 28.68±1.63 years (range: 6-80 years. Besides, 33(58.9%) patients were in the age range 20-40 years followed by 18(32.1%) below 20 years. Overall, 27(48.2%) patients were jobless and 24(42.9%) had education below grade ten. Pistol was the most commonly-used weapon in 28(50%).Hospital stay was 2-10 days with a mean of 4.37±1.74 days. Single-entry wound on the neck was common 21(37.5%), predominantly on the right side 24(42.9%), while there were 33(58.9%) single-exit wounds, affecting neck in 18(32.1%) cases and on the left side in 19(33.9%).

Conclusion: Firearm injuries were common among young men who were illiterate and poor socioeconomically. Homicidal injuries mostly occurred during the daytime. Pistol was the most commonly-used weapon, while wounds on the neck were more common.

Keywords: Firearm, Homicide, Suicide, Head and neck. (JPMA 66: 849; 2016)

Introduction

By and large, firearm injury (FAI) is an uncommon cause of violence in the human ecology. However, an increase in its trend has been observed in the recent past in most of the countries. There was 30% rise in FAI in UK between 1998 and 2002; that tendency still persists. Similarly in American countries there was a dramatic increase in the incidence of FAI - 5-6 times greater than Europe and 95 times more than Asia.[1] The World Health Assembly (WHA) declared FAI as global public health issue due to its significant morbidity, long-standing physical, psychological, mental and economical disability of the individuals, families, communities and countries.[2] There are almost 639 million arms in circulation across the globe, which means more than one weapon to 10 people. This results in 300,000 deaths from armed conflict and about 200,000 deaths from homicides and suicides per annum. These arms result in 90% of the world's combat-related killing and about 100% murders.[3] Suicidal FAI are more prevalent in high-income countries, while assaults and homicides are more common in low-income countries. Self-inflicted injuries are not uncommon in elderly people and children are mainly victims of homicidal injuries.[4] FAI can be caused by different weapons like pistol, air gun, rifle and machine gun, but injuries due to pistol are very common. FAIs are more common in Pakistan like other developing countries due to poverty, unemployment, socioeconomic inequality, illiteracy, easy access to illegal weapons, cultural norms, poor law and order, domestic violence, suicidal adventures, accidental release of bullets and air shooting. Moreover, uncertain geopolitical situation, tribal areas and war on terror in Khyber Pakhtunkhwa (KP) and lengthy border with war-affected Afghanistan make the province more prone to FAI. FAI soccur in the form of homicidal, suicidal, sectarian, robbery-related and accidental incidents.[5,6] The severity of FAI depends on the calibre of the weapon, distance of fire and the organ injured. Few victims survive from injuries on vital organs like head, chest and cervical spine. Homicidal injuries are common at head and chest while suicidal injuries are more common on peripheral parts of the body.[7,8]

Patients with FAI frequently present to our unit from all over KP and the neighbouring country. The current study was conducted to look into the characteristics of FAI at our setup, because, to our knowledge, such a study has

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never been conducted before at the institute.

Patients and Methods

This prospective, cross-sectional study was conducted at the Department of Ear, Nose, Throat (ENT) Head and Neck Surgery, Lady Reading Hospital (LRH), Peshawar, from June 2014 to May 2015. Patients regardless of age and gender sustaining FAIs at ENT, head and neck regions were included. Those with simultaneous injuries other than head and neck region were excluded. After resuscitation, the patients were evaluated in terms of detailed history regarding FAIs and thorough examination of the wounds. Systemic review of each patient and relevant investigations like plain X-Rays, computed tomography/magnetic resonance imaging (CT/MRI) were also carried out. Every patient was admitted to the ENT ward and kept under close observation for at least 48 hours, and necessary procedures like tracheostomy, nasogastric intubation and blood transfusion were carried out. Ethical approval for the study was obtained from the institutional ethical board. Data was collected on predesigned proforma and analysed using SPSS 16. Frequency and percentages were calculated for qualitative variables while mean and standard deviations were calculated for quantitative variables.

Results

Of the 56 patients enrolled, 49(87.5%) were men and 7(12.5%) were women, with a male-to-female ratio of 7:1. The overall mean age was 28.68±1.63 years (range: 6-80 years). Besides, 33(58.9%) patients were aged between 20 and 40 years, followed by 18(32.1%) below 20 years. Of the total, 27(48.2%) were jobless and 12(21.4%) were labourers, while 37(66.1%) belonged to lower socioeconomic status. Overall, 51(91.1%) patients were

Table-1: Time of incidence and position of victim during FAI (N=56).

Time of Fire		
Time	**Frequency**	**Percent**
Daytime	43	76.8%
Nighttime	13	23.2%
Total	56	100.0
Position of Victim		
Position	**Frequency**	**Percent**
Lying	4	7.1%
Sitting	18	32.1%
Standing	29	51.8%
walking	4	7.1%
Driving	1	1.8%
Total	56	100.0

FAI: Firearm injuries.

Table-2: Characteristics of Fire arm wounds (N=56).

No of entry wound		
Entry wound	**Frequency**	**Percent**
Single	47	83.9%
Multiple	9	16.1%
Total	56	100.0
Site of Entry wound		
Site	**Frequency**	**Percent**
Upper Face	3	5.4%
Mid Face	18	32.1%
Lower Face	11	19.6%
Neck	21	37.5%
Head	3	5.4%
Total	56	100.0
Side of Entry wound		
Side	**Frequency**	**Percent**
Right	24	42.9%
Left	20	35.7%
Both	1	1.8%
Front	9	16.1%
Back	2	3.6%
Total	56	100.0
No of exit wound		
No of wounds	**Frequency**	**Percent**
Single exit wound	33	58.9%
Tow exit wound	7	12.5%
No exit wounds	16	28.6%
Total	56	100.0
Site of exit wound		
Site	**Frequency**	**Percent**
Upper face	2	3.6%
Middle face	7	12.5%
Lower face	4	7.1%
Neck	18	32.1%
Head	4	7.1%
Non ENT site	3	5.4%
No Exit wound	18	32.1%
Side of exit wound		
Side	**Frequency**	**Percent**
Right	15	26.8%
Left	19	33.9%
No Exit wound	18	32.1%
Front	3	5.4%
Back	1	1.8%
Total	56	100.0

ENT: Ear, nose, throat.

Table-3: Clinical features, status of Foreign Body and Bone Fracture (N=56).

Clinical features Dysphagia	Frequency	Percent
Yes	17	30.4%
No	39	69.6%
Total	56	100.0
Breathlessness	**Frequency**	**Percent**
Yes	7	12.5%
No	49	87.5%
Total	56	100.0
Status of Foreign Body (Bullets) **Foreign Body**	**Frequency**	**Percent**
Present	22	39.3%
Absent	34	60.7%
Total	56	100.0
Status of Bone Fracture **Bone Fracture**	**Frequency**	**Percent**
Yes	22	39.3%
No	34	60.7%
Total	56	100.0

Pakistanis, belonging to KP. As many as 24(42.9%) patients had education below matric, while 22(39.3%) were illiterate. Pistol was the most commonly used weapon 28(50.0%); 34(76.8%) FAIs took place during the daytime; 29(51.8%) victims were standing at the time of the incident; and 18(32.1%) were sitting (Table-1). The mean hospital stay was 4.37±1.74 days (range: 2-10 days). The majority of patients, 47(83.9%), had single-entry wound, commonly involving neck in 21(37.5%) and predominantly on the right side in 24(42.9%). There were 33(58.9%) single-exit wounds, commonly affecting neck in 18(32.1%) cases and on the left side in 19(33.9%) (Table-2). Besides FAIs, 17(30.4%) patients had difficulty in swallowing and 7(12.5%) also suffered from breathlessness. Bullets were present in the body of 22(39.3%) victims, while the same number of patients had bone fracture (Table-3).

Discussion

Patients sustaining FAIs are frequently admitted to ENT departments. Like other developing countries, the incidence of FAIs in Pakistan has increased in the recent past. It has multiple risk factors and outcomes. Men outnumbered women in this study with a male-to-female ratio of 7:1, which is consistent with other local studies. For example, in one study,[5] there were 78.3% males, while in another study[7] the male-to-female ratio was 49:1, which was seven times higher than our study. This male dominance is also quoted in international studies like the one[3] from Nigeria with male-to-female ratio of 20:1. This is because males are more involved in outdoor and interpersonal activities. Most of the patients (58.9%) were in the age range of 20-40 years, which is similar to a study[6] from Bahawalpur where most victims were aged between 30 and 40 years. People in this age group are more active, emotional and violent, hence more prone to FAIs. In the literature, sufficient data is not available regarding professional and educational level of victims. However in this study, 37(66.1%) were poor socioeconomically, 27(48.2%) were jobless, 24(42.9%) had education below grade ten and 22(39.3%) were illiterate, which is in accordance with a study[9] which found that a majority of patients were unemployed 98(63.6%), while 102(66.2%) possessed primary or no formal education. Similarly, a study[10] worked out that 210(16.9%) participants were students, 160(12.9%) had no significant profession, 150(12%) were labourers and 182(14.6%) were jobless. There was a significant association between education level and occupation as FAIs were more common in people who were either jobless or lacked a reasonable occupation and those having no formal education. In this study, 28(50%) FAIs were related to pistol, which is in conformity with the work of Odai[11] who reported that pistol was the commonest weapon (42.9%), followed by rifle and shotgun (21.3% each). Similarly, Hussain[10] conducted a study on epidemiology of FAI and he noted that home-made weapons (30 and 32 bores) were the commonest weapon (70.9%), followed by automatic guns (20%). Severity of FAI depends on the distance, calibre of weapon and the organ sustaining injuries. In this study, the damage caused by FAI was not severe because calibre of the weapon (pistol) was small, which differs from study of Zeren[12] who found that majority of fires were long-distance shooting and more destructive. Sachan[13] also reported that 60.60% of the victims were fired at from close range, while 16.67% from distance. There is no time specification for the occurrence of FAIs. However, FAIs related to robbery took place at night-time, while those due to interpersonal event occurred during the daytime. FAIs reported in this study were more common (76.8%) during the daytime, which is supported by study of Abbas,[14] who observed that majority of victims (72.2%) received FAI during the day, while 27.8% were shot at night. Results of this study differ from studies[2,15] where most FAIs occurred at 2100-2400 hours and 1900-2400 hours (23% and 55.5%), respectively. In this study, hospital stay ranged from 2-10 days with mean of 4.37days, compared to 1-70 days (mean 18.12±12.24) in another

study.[9] Similarly, in one study[15] hospital stay was 1-207 days with a mean of 16.7 days and in Another study[16] said the mean hospital stay was 16.6±19.1days. The reason for short stay in our study was that most of the patients had stable injuries at arrival and were discharged after complete stabilisation with collaboration of maxillofacial surgeon. This study found single-entry wound 47(83.9%) on the right side of the neck 21(37.5%) with single-exit wound 33(58.9%), on the left side of the neck 19(33.9%). Similarly, Asirdizer[17] pointed out that single-entry wound was most common 29(39.8%) and entry wound in males were nine time more common on the neck. Channar[5] also observed that 76.7% patients sustained single-entry wound and the commonest site (58.3%.) was lower face. Chalya[9] also noted that 53.1% patients had injuries on head and neck. The site of entry wound in this study is contrary to the Marri's[18] study where only 4% patients sustained single-entry wound and chest was predominantly involved (33.8%), followed by the head and neck regions (25.61%). Similarly in studies of Niaz,[6] Abbas,[14] Alassiri[16] and Nasrullah[2] limbs were the commonest site of entry wounds with a frequency of 48%, 46.1%, 52.5% and 30%, respectively. A probable explanation is that they included all the patients sustaining FAI on any region of the body, and thus survival rate in patients with wounds on limbs was higher compared to those who had wounds on chest and head as they died on the spot and rarely reached hospital. In 22(39.3%) patients, FB was found in the body and bone fracture was also found in 22 (39.3%), similar to Goswami's[19] study.

Conclusion

FAI was a common problem among illiterate and poor young men. Homicidal FAI, which was not uncommon, mostly occurred during the daytime. Pistol was the commonly used weapon used for fire. Single-entry wound was sustained more on the right side of the neck with exit wound on the left side.

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Conflict of Interest: None.

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