

## MORBIDITY & MORTALITY OF FIREARM INJURY IN PESHAWAR REGION

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**Background:** Firearm injuries cause significant morbidity and mortality among its victims. The present study, carried out at a major tertiary care hospital of Peshawar, Pakistan was aimed at highlighting the extent and severity of firearm-related morbidity and resultant mortality despite expert medical care. **Methods:** All victims of firearm injury brought to the Lady Reading Hospital Peshawar Emergency Department and thereafter admitted to hospital wards during the period mid-2006 to mid-2007 were included in the study prospectively regardless of age, gender or socio-economic status. Data relevant to the background of firearm use, type of firearm used, types and extents of injuries, clinical condition of the patients and final outcome were collected on performas and entered into SPSS 15.0 for analysis. **Results:** Seventy-four cases of firearm injury were recorded during the study period, with a predominant male to female ratio (9.6:1). Most victims (79.7%) were in the age group of 15–35 years. Although there were more cases from Peshawar (28.4%), there was no major referral pattern noted. High velocity weapons were used in 95.9% of cases and homicide was the main motive for injury (60.8%). Injuries were sustained most frequently in the abdomen and pelvis (44.6%) and 67.6% of victims sustained internal injuries. There were only 5 (6.8%) deaths from firearm injuries. **Conclusion:** It is concluded, the young males of the population must be targeted for lifestyle adjustments such as training to refrain from anger or disputes (usually over petty things) and to prevent the easy access of firearms as a weapon to settle disputes.

**Keywords:** Firearm injury, Homicide, High velocity weapon, Entry wound, Exit wound, Internal injuries.

### INTRODUCTION

Over the year, firearm injuries have experienced global<sup>1</sup> episodes of epidemic and endemic nature, particularly in the USA,<sup>2</sup> South Africa,<sup>3</sup> Italy,<sup>4</sup> Finland<sup>5</sup> and South Asia.<sup>6</sup> The few studies from Pakistan also highlight the contributions of firearm injuries to morbidity and mortality.<sup>7–10</sup>

Firearms have been used, and continue to be used, both for homicidal and suicidal<sup>11–14</sup> purposes, offering an easy and quick mode of injury or death. Intimately related to firearm use is the availability of firearm weapons of various types to the public in most parts of the world. Such weapons form part of the unregulated pool of lethal weapons that can be eliminated only by strict gun control policies of governments and the cooperation of the public. It has been observed that proper implementation of policies by law enforcing agencies has resulted in sharp declines in firearm possession as well as firearm related morbidity and mortality figures.<sup>15–18</sup>

### MATERIAL AND METHODS

The study was conducted in the Lady Reading Hospital Peshawar from mid-2006 to mid-2007 on all cases of firearm injuries irrespective of age, gender or socio-economic status brought to the hospital emergency department and later admitted to the department of surgery. All relevant data were entered on performas

including background of firearm use, type of firearm used, types and extents of injuries, clinical condition of the patients and final outcome. Follow up of survivors was conducted to determine rehabilitation status of their morbidity. Data were analysed using SPSS 15.0.

### RESULTS

A total of 74 cases of firearm injuries were recorded during the study period. This was composed of 67 (90.5%) males and 7 (9.5%) females giving a male: female ratio of 9.6:1. The ages of victims ranged from 15 to 60 years with a mean age of 29.61±11.17 years; 79.7% of victims were between the ages of 15–35 years (Table-1). Most of the victims (21, 28.4%) belonged to Peshawar, followed by Charsadda (16, 21.6%), Kohat (7, 9.4%), Mardan (3, 4.1%), Nowshera, Swabi, and Khyber Agency (2 each, 2.7% each); 14 (24.3%) cases belonged to other parts of NWFP, while 3 (4.1%) were from unknown parts of NWFP.

Regarding occupations, 6 (8.1%) were jobless, 9 (12.2%) were farmers, 11 (14.9%) were labourers, 9 (12.2%) were students, 10 (13.5%) were drivers, 6 (8.1%) were housewives, 3 (4.0%) were shopkeepers and 1 each (2.7%) each were imam masjid and police havaldar; occupation was not known for 18 (24.3%) of cases. The weapons used were high velocity in 71 (95.9%) of which there were 2 (2.8%) victims of bomb blasts; an unknown weapon was used in 3 (4.1%) of cases.

**Table-1: Socio-demographic data of firearm victims (n=74)**

Variables	No. of cases	Percentage
<b>Gender</b>		
Males	67	90.5
Females	7	9.5
<b>Age groups (yrs)</b>		
15-25	35	47.3
26-35	24	32.4
36-45	8	10.8
46-55	4	5.4
56-65	1	1.4
<b>Districts (NWFP)</b>		
Peshawar	21	28.4
Charsadda	16	21.6
Kohat	7	9.4
Mardan	3	4.1
Nowshera	2	2.7
Swabi	2	2.7
Khyber Agency	2	2.7
Other parts	14	24.3
Unknown	3	4.1

Table-2 shows details of firearm injuries sustained by the victims.

**Table-2: Details of injuries sustained in firearm victims (n=74)**

Details of injuries	No. of cases	Percentage
<b>Manner of injury</b>		
Homicidal	45	60.8
Accidental	7	9.5
Self-Inflicted	4	5.4
Unknown	18	24.3
<b>Wounds sustained (n=198)</b>		
Entry	117	59.1
Exit	81	40.9
<b>Type of wound (n=74)</b>		
Single	47	63.5
Multiple	27	36.5
<b>Region of body</b>		
Chest	11	14.9
Abdomen & Pelvis	33	44.6
Extremities	15	20.3
Multiple areas	15	20.3
<b>Internal injuries</b>		
None	24	32.4
Multiple	50	67.6
<b>Outcome</b>		
Discharged	69	93.2
Died	5	6.8

In 45 (60.8%) cases, the injuries were caused by homicidal attacks, whereas in 7 (9.5%) cases, history of accidental firearm injuries were obtained; in 4 (5.4%) cases, the injuries were self-inflicted and in the remaining 18 (24.3%) the cause(s) of firearm injuries were unknown as history was not obtainable.

A total of 198 wounds were sustained, comprising 117 (59.1%) entry wounds and 81 (40.9%) exit wounds. Single entry wounds were found in 47 (63.5%) cases with the remaining 27 (36.5%) having multiple entry wounds; of these 12 (44.4%) were having 2 entry wounds, 6 (22.2%) were having 3 entry wounds, 7 (25.9%) had 4 entry wounds and 2 (7.4%)

had multiple entry wounds. In 21 (28.4%) cases, there were no exit wounds, while 1 exit wound was found in 39 (52.7%) cases, 2 exit wounds were found in 4 (5.4%) cases, 3 exit wounds were found in 6 (8.1%) cases and 4 exit wounds were found in 4 (5.4%) cases.



**Figure-1: Typical entry wound in back of abdomen.**



**Figure-2: Typical entry wound in extremities with tangential impact.**

The most common region of body involved in firearm injury was the abdomen including pelvis (33, 44.6%), followed by extremities and multiple areas including head and face (15 each, 20.3% each); the chest was involved in 11 (14.9%) of cases. Internal injuries were sustained by 50 (67.6%) of cases; these included perforations of viscera such as various parts of the GIT, urinary bladder, and inferior vena cava. Shattered wounds were sustained by the liver, spleen and kidneys. Outcome of 69 (93.2%) cases was nonfatal and they were discharged after appropriate surgical treatment; the remaining 5 (6.8%) cases had a fatal outcome.

## DISCUSSION

Our results indicate that most victims of firearm injuries referred to the Lady Reading Hospital Peshawar were young males (15-35 years, 59 cases, 79.7%) with a geographical distribution mostly in the major cities of NWFP (Table-1). Though no occupation was associated with higher risk of firearm injuries, most of the victims were engaged in simple occupations such as labour, farming, taxi driving; a good number of students were

also victims. In almost all the cases, high velocity weapons were used as firearms. The manner of injury in vast majority of cases was homicidal with few accidental and suicidal cases (Table-2). The victims received an average of 3 wounds to the body, with a distribution in the abdomen and pelvis in the majority of cases, followed by the extremities and chest. Multiple internal injuries were also sustained by most of the victims. Fortunately almost all victims were treated and discharged with only a few mortalities (Table-2).

These findings are in agreement with other studies on firearm injuries from various parts of Pakistan. Several studies have pointed out that young males are most often the victims of firearm injury. Marri *et al* (2006)<sup>19</sup> in their study on homicidal deaths in Peshawar concluded that males constituted 86.15% of the victims of homicide and 32% of victims were in the third decade of life; Bashir *et al*<sup>20</sup> in their 12-year study from Lahore conclude that 88% were males with 42% being in the age range of 21–30 years. Studies from other parts of Pakistan also report similar findings.<sup>21,22</sup> This reflects the fact that males are more involved in disputes and rivalry at younger ages and have ready access to firearms as compared to females; in most cases, the females are considered accomplices or partners of the intended victim or are innocent bystanders. However the high frequency (52.5%) of females involved in Sindh<sup>23</sup> may reflect different life styles in which females and males have almost equal access to victimization or that females are targeted in particular in Sindh where the tradition of 'karo-kari' is in practice.

The fact that homicide is the leading cause of firearm injury in our study (60.8%) is also reflected in other studies from various parts of the country. Frequencies of homicidal firearm injuries/deaths range from 61.8% in Sindh,<sup>23</sup> 64.9% in DI Khan<sup>10</sup> and 77.7%<sup>9</sup> and 78.5%<sup>19</sup> in Peshawar.

The body regions involved in firearm injuries do not reflect a uniform pattern. In our study, the most frequently targeted part was the abdomen and pelvis, while in a previous study from Peshawar<sup>19</sup> the chest was the part most frequently involved. Other studies report the head, neck and face<sup>9,10</sup> as the most frequently injured areas.

It is concluded, the young males of the population must be targeted for lifestyle adjustments such as training to refrain from anger or disputes (usually over petty things) and to prevent the easy access of firearms as a weapon to settle disputes.

## REFERENCES

1. Richmond TS, Cheney R, Schwab CW. The global burden of non-

2. Christoffel KK. Firearm injuries: epidemic then, endemic now. *Am J Public Health*. 2007;97(4):626–9. ePub 2007 Feb 28.
3. Meel B. Trends in firearm-related deaths in the Transkei region of South Africa. *Am J Forensic Med Pathol*. 2007;28(1):86–90.
4. Solarino B, Nicoletti EM, Di Vella G. Fatal firearm wounds: a retrospective study in Bari (Italy) between 1988 and 2003. *Forensic Sci Int*. 2007 24;168(2–3):95–101. ePub 2007 Feb 23.
5. Mattila VM, MÄkitie I, Pihlajamäki H. Trends in hospitalization for firearm-related injury in Finland from 1990 to 2003. *J Trauma*. 2006;61(5):1222–7.
6. Gorea RK. Impact of proliferation of small arms and light weapons in south Asia. *Med Confl Surviv*. 2006;22(3):199–206.
7. Bashir Z, Rana PA, Malik SA, Shaheen A. Pattern of Deaths due to firearms in Lahore - A twelve-year study. *Pakistan Postgrad Med J* 2000;11(3):109–14.
8. Hassan Q, Shah MM, Bashir MZ. Homicide in Abbottabad. *J Ayub Med Coll Abbottabad* 2005;17(1):78–80.
9. Hussain Z, Shah MM, Afridi HK, Arif M. Homicidal deaths by firearms in Peshawar: an autopsy study. *J Ayub Med Coll Abbottabad* 2006;18(1):44–7.
10. Mujahid M, Hassan Q, Arif M, Gandapur J, Shah H. Homicidal deaths by firearms in Dera Ismail Khan: an autopsy study. *Pakistan J Med Res*. 2006;45(1):14–6.
11. Shields LB, Hunsaker DM, Hunsaker JC 3rd. Schizophrenia and suicide: a 10-year review of Kentucky medical examiner cases. *J Forensic Sci*. 2007;52(4):930–7. ePub 2007 Jun 6.
12. Streib EW, Hackworth J, Hayward TZ, Jacobson LE, Simons CJ, Falimirski ME, O'Neil J, Bull MJ, Gomez GA. Firearm suicide: use of a firearm injury and death surveillance system. *J Trauma*. 2007;62(3):730–4.
13. Balci Y, Canogullari G, Ulupinar E. Characterization of the gunshot suicides. *J Forensic Leg Med*. 2007;14(4):203–8. ePub 2007 Feb 23.
14. Shields LB, Hunsaker DM, Hunsaker JC 3rd. Suicide: a ten-year retrospective review of Kentucky medical examiner cases. *J Forensic Sci*. 2005;50(3):613–7.
15. Beautrais AL, Fergusson DM, Horwood LJ. Firearms legislation and reductions in firearm-related suicide deaths in New Zealand. *Aust N Z J Psychiatry*. 2006;40(3):253–9.
16. Macinko J, de Souza Mde F. Reducing firearm injury: lessons from Brazil. *LDI Issue Brief*. 2007;12(7):1–4.
17. Marinho de Souza Mde F, Macinko J, Alencar AP, Malta DC, de Moraes Neto OL. Reductions in firearm-related mortality and hospitalizations in Brazil after gun control. *Health Aff (Millwood)*. 2007;26(2):575–84.
18. Chapman S, Alpers P, Agho K, Jones M. Australia's 1996 gun law reforms: faster falls in firearm deaths, firearm suicides, and a decade without mass shootings. *Inj Prev*. 2006;12(6):365–72.
19. Marri MZ, Bashir Z, Munawar AZ, Khalil ZH, Khalil IR. Analysis of homicidal deaths in Peshawar, Pakistan. *J Ayub Med Coll Abbottabad* 2006;18(4):30–3.
20. Bashir Z, Rana PA, Malik SA, Shaheen A. Pattern of Deaths due to firearms in Lahore—A twelve-year study. *Pak Postgrad Med J* 2000;11(3):109–14.
21. Bashir MZ, Saeed A, Khan D, Aslam M, Iqbal J, Ahmed M. Pattern of homicidal deaths in Faisalabad. *J Ayub Med Coll Abbottabad* Jun 2004;16(2):57–9.
22. Qadir G, Aziz K. The study of Homicidal deaths in Larkana. *Pak Postgrad Med J* 2000;11(2):79–80.
23. Sahito MM, Mughal MI, Chang F, Shah SMH, Pirzada SG, Jamali, YA *et al*. Causes of death in interior Sindh—A medicolegal autopsies study. *Pak Postgrad Med J* 2002;13(4):161–4.

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