

Pattern of Firearm Injury and Outcome

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ABSTRACT

OBJECTIVE: To study the pattern and outcomes of firearm injuries at Department of Surgery during 3 years.

DESIGN: Retrospective study.

SETTING: Department of Surgery, Unit II, Chandka Medical College Teaching Hospital Larkana.

DURATION: Three years, from July 2004 to June 2007.

PATIENTS AND METHODS: Record of all firearm injury cases, who presented during study period, was analysed. Data were collected on printed proforma from indoor patient record (case file) and operation theatre record. Demographic data, clinical presentation, site and frequency of injuries, investigations including radiology, operative findings, and postoperative course were the variables of study.

RESULTS: Out of 282 firearm injured patients, 258 were males and 24 were females, with male to female ratio of 10.7:1. The age ranged 12-80 years. Ninety-nine (33.68%) patients had injuries to abdomen only and 72 (25.53%) to chest only, while 72 (25.53%) patients had multiple injuries including injuries to abdomen. One-hundred and twelve (39.71%) patients underwent Laparotomy (including patients with multiple injuries), 66 (23.40%) required chest intubations. Two-hundred and forty-four (86.52%) patients were cured and discharged. Seven (2.48%) patients were referred to other departments like Orthopaedics and Neuromedicine and 14 (4.96%) to other hospitals with advanced patient care facilities. Mortality rate was 6%.

CONCLUSION: The firearm injury is common in 20-39 year old males. The most common site of injury is abdomen. The commonly injured intra-abdominal organ is bowel followed by liver and kidney, while most commonly injured extra-abdominal organ is lung.

KEY WORDS: Firearm Injury, Pattern, Outcomes.

INTRODUCTION

Penetrating injuries constitute a significant percentage of cases seen at accident and emergency department of most hospitals and include both stab injuries and firearm injuries¹⁻³. Firearm injury is a global problem and causes a considerable quandary in a developing country like ours, where poverty and violence are rife⁴.

Most firearm injuries are the result of enmity, communal clashes, domestic disputes, or suicide. Firearm injuries are potentially devastating to tissues, depending on the caliber of the weapon. In high velocity rifle and shotgun wounds, the damage to soft tissues and bone is massive with extensive tissue necrosis. On the other hand, low velocity pistol or handgun injuries are usually devoid of temporary cavitatory effects and severe soft tissue devitalization⁴. Several studies have documented the pattern of firearm related injuries and deaths⁵⁻⁷. The aim of this study was to describe the pattern and outcome of firearm injury at a tertiary care hospital which did not possess the modern patient care facilities including intensive care unit/high dependency unit.

MATERIAL AND METHODS

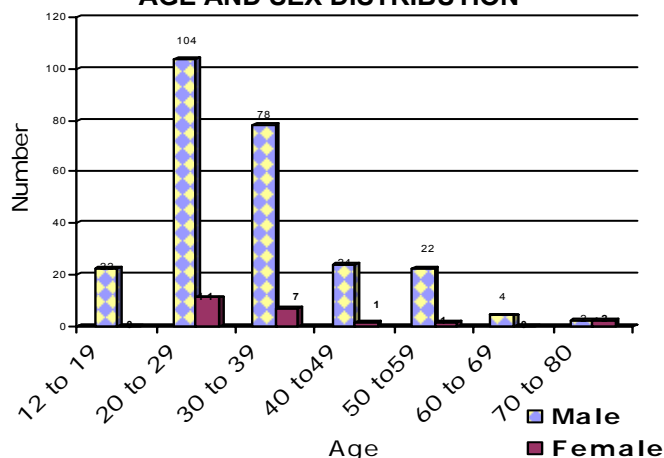
This was a retrospective analysis of consecutive 282 patients of firearm injuries admitted through Emergency Department to Surgical Unit-II, Chandka Medical College Teaching Hospital Larkana, from July 2004 to June 2007. All cases above 12 years of age with firearm injuries presented during the period under review were included in this study. Patients under 12 years of age and those with incomplete record were excluded. The data were collected on printed proforma from indoor patient records (case files) and operation theatre record. The data collected included demographic information, clinical presentation, site and number of injuries, radiological and other investigations, operative finding and postoperative course.

RESULTS

A total of 282 patients were managed for firearm injuries to various sites during the period under review. There were 258 males and 24 females with male to female ratio of 10.7:1. The age ranged between 12 to 80 years. The frequency was highest in patients of 20-39 year age group (70.8%) (**Figure 1**). The most common anatomical site of injury was abdomen

(33.68%) followed by chest (25.53 %), while 25.53% patients sustained multiple injuries including injuries to abdomen (**Table I**). One-hundred and twelve patients underwent exploratory Laparotomy including those with multiple injuries and having injury to abdomen besides other injuries. The most commonly injured organ was bowel (53.57%) followed by liver (16.07%) (**Table II**). Among females, 5 patients (including 3 pregnant) had uterine injuries. Dead fetuses were delivered in 2 and a single alive baby in 1. Uterine perforations were repaired in other two patients. Among extra-abdominal injuries, lungs were most frequently injured organs in 72 patients out of which, 66 (23.4%) underwent chest intubations. Firearm injuries to limbs were mostly superficial and treatment included debridement and daily dressing with or without skin grafting. Two patients were referred to Orthopedic Department, while 5 patients had injuries to nerves and neuronal plexus and were referred to Neurology Department for further management. Two-hundred and forty-four (86.52%) patients were cured and discharged. Seven patients were referred to other departments, while 14 to other hospitals for further management. Seventeen patients expired giving a mortality of 6.02% (**Table III**).

**FIGURE I:
AGE AND SEX DISTRIBUTION**



**TABLE I:
INJURED BODY PARTS (n=282)**

Site of Injury	No. of Patients	Percentage
Abdomen	95	33.68
Chest	72	25.53
Multiple injuries	72	25.53
Upper limb	18	6.39
Lower limb	16	5.68
Head and neck	9	3.19

**TABLE II:
DISTRIBUTION OF INJURED ABDOMINAL
ORGANS (n=112)**

Injured organ	No. of Patients	Percentage
Bowel	60	53.57
Liver	18	16.07
Kidney	07	6.25
Retroperitoneal hematoma	06	5.35
Uterus	05	4.46
Spleen	05	4.46
Urinary bladder	04	3.58
Major vessels	04	3.58
Gall bladder	03	2.68

**TABLE III:
OUTCOME OF FIREARM PATIENTS (n=282)**

	Number	Percentage
Treatment		
Laparotomy	112	39.71
Chest Intubation	66	23.40
Outcome		
Cured	244	86.52
Referred to other Departments	07	2.48
Referred to other Hospitals	14	4.96
Expired	17	6.02

DISCUSSION

Firearm injury is a common problem in our community because of the legally and illegally acquired firearms by the people, increasing violence, communal clashes, armed robbery attacks, domestic violence, other forms of interpersonal violence, unintentional discharges or suicidal attempts.

In this study the frequency of firearm was highest in patients aged 20-39 years (almost 70%). This is consistent with other studies⁵⁻⁷. Male preponderance reported by other workers was also found in this study⁶⁻¹⁰. The male to female ratio was 10.7:1. Some of the reasons adduced for male predilection in various studies are that males, particularly in younger age group, are generally more aggressive and more adventurous in demonstrating resistance to perceived threats¹¹⁻¹³. In this study the most common site of injury was abdomen. This is in contrast to other studies where chest or head are the common sites¹⁴. Whether laparotomy should be performed in all cases of penetrating injuries is controversial. Kennedy et al suggested that in

centers where adequate radiological facilities are available, some cases of gunshot injuries could be managed conservatively and if indicated, surgery can then be performed¹⁵. In this study only those patients with definite peritoneal penetration were explored while hemodynamically stable patients with equivocal clinical signs were observed in order to minimize the risk of negative laparotomies.

On Laparotomy the most commonly injured organ was bowel (53.37%) followed by liver (16%). This is similar to other studies, where small bowel, liver and stomach are most frequently injured organs.¹⁶⁻¹⁷

Moreover previous studies have shown that in abdominal gunshot wounds the mortality rate rises with number of intra-abdominal injured organs.^{17,18} A positive linear relationship was demonstrated in this study too. In addition, the mortality was noticed to be highest in liver injuries alone. The overall mortality in this study was 6%, which is not as high as reported in other studies.^{16,19} This can be attributed to young age of injured persons, sites of injuries, early reporting/referrals to other hospitals, rapid surgical intervention, improved pre-, intra- and post-operative patient care.

CONCLUSIONS

The firearm injury is more frequent in 20-39 years age group and the males are more commonly affected. The most common site of injury is abdomen and frequently injured intra-abdominal organs are bowel and liver, while lungs are the commonly injured extra-abdominal organs.

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