ORIGINAL RESEARCH PAPER

Surgery

KEY WORDS: Violence, gunshot injuries, bullet.

ABDOMINAL GUNSHOT WOUNDS DURING CIVILIAN VIOLENCE IN KASHMIR, A PROSPECTIVE STUDY.

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ABSTRACT

Background: In the present world, Violence is emerging as a major public health problem taking a heavy toll of human lives and is telling upon the health care of the communities.
Objectives: To assess the pattern and outcome of gunshot victims in our valley as a means to improve the existing health care infrastructure.
Methodology: The study was conducted in the department of surgery, Government medical college Srinagar during an episode of civil unrest in july 2016. The patients with bullet injuries to abdomen formed the part of our study. All the patients were assessed for age, sex, Clinical presentation, need for surgery, Intra-operative findings, outcome and postoperative course.
Observations: In a total of 356 injured patients received in the emergency department during the period of unrest.. 45 patients (12.64%) had bullet injuries, 7 patients(1.9%) were hit by tear gas shells and 304 patients(85.3%) were the victims of pellet injuries. Among the bullet hit patients 30 patients (66.67%) had bullet injury to the abdomen while as 15 patients (33.11%) had bullet injury to other parts of body like head and neck and extremities. The main cause of gunshot injuries in our region are the bullets fired by armed government personals on rioting mobs during episodes of civil unrest. The mean age of patients in our study was 26.5 ± 8.9 years. The most common presentation of abdominal bullet injuries in our study was peritonitis in 12/20 patients (60%) followed by shock in 6/20 patients (30%). 1 patient in our study had evisceration of small bowel through the exit wound 5/20 patients (25%) had associated hemothorax and 3/20 patients had associated pelvic fracture in our study. Majority of patients in our study , 10/20 patients (50%) had small bowel perforation. 2 patients had liver trauma, one among them had major hepatic vascular injury. 2 patients in our study had associated splenic injury, 3 patients had colonic perforation, 2 had diaphragmatic tear, 2 had pelvic fracture, 1 patient had vertebral fracture and 1 had associated renal injury. Postoperatively, 12/20 patients in our study developed wound infection, 2/20 patients developed abdominal dehiscence and 2/20 patients developed septicaemia.
Conclusion: There is a strong need to provide all the major hospitals in this valley with well equipped trauma care facility centres so as to utilise the valuable time otherwise lost in transporting every such patient to a tertiary care hospital and a hospital based registry for reporting all such gunshot injuries with respect to the place of the incident and their outcome be maintained so as to assess both the magnitude of this violence as well as to serve as a measure to improve the health care infrastructure.

INTRODUCTION:

In the present world, Violence is emerging as a major public health problem. Violence either at individual like Suicide, Homicide or at a large scale like Communal riots, political suppression of communities etc is taking a heavy toll of human lives and is telling upon the health care of the communities. The free availability of firearms has further lead to an increase in the violence rates [1]. Kashmir is a place where although weapon is not freely available, but since the eruption of armed struggle in Kashmir, the valley has witnessed the worst forms of violence that has killed tens of thousands and left many more disabled [2]. In the past few years, the struggle has taken a new form wherein the civilians in large numbers demonstrate on roads against the government oppression and clash with the government forces. The weaponry used by the government forces to quell the protestors is the major source of the gunshot wounds and weapon violence in Kashmir.

We performed a study on the pattern and outcome of these abdominal gunshot wounds during the episodes of violence in Kashmir as a means to help in improving our health care infrastructure in managing such types of weapon violence.

MATERIALS AND METHODS:

The study was conducted in the department of surgery, Government medical college Srinagar during an episode of civil unrest in july 2016. A total of 356 injured patients were received in the emergency department during the period of unrest.. 45 patients (12.64%) had bullet injuries, 7 patients(1.9%) were hit by tear gas shells and 304 patients(85.3%) were the victims of pellet injuries. Among the bullet hit patients 30 patients (66.67%) had bullet injury to the abdomen while as 15 patients (33.11%) had bullet injury to other parts of body like head and neck and extremities.

The patients with bullet injuries to abdomen formed the part of our study. All these patients after being received in the emergency were initially resuscitated as per Advanced Trauma Life Support (ATLS) guidelines to ensure their safety. All patients underwent a Focussed assessment Sonography for Trauma (FAST) scan in the emergency room by a radiologist. Hemodynamically stable patients were further evaluated by Contrast Enhanced Computerized Tomography (CECT) scan of abdomen and pelvis. All the patients were assessed for age, sex, anatomic site of entry and exit wounds, need for surgery, Intra-operative findings, outcome and postoperative course.

RESULTS:

The age distribution of the patients in our study is shown in the table below, table 1:

Table 1: Age distribution of patients

Age group (in years)	No. of Patients
10 – 19	4
20 - 29	10
30 - 39	4
40 - 49	2
50 - 59	0
Total	20

Most of the patients in our study were in 20-29 year age group (50%) followed by 10-19 year age group(20%). The mean age of patients in our study was 26.5 ± 8.9 years.

In a total of 15 patients in our study only 3 patients were females. Figure below shows the sex distribution of patients in our study; Fig 1:

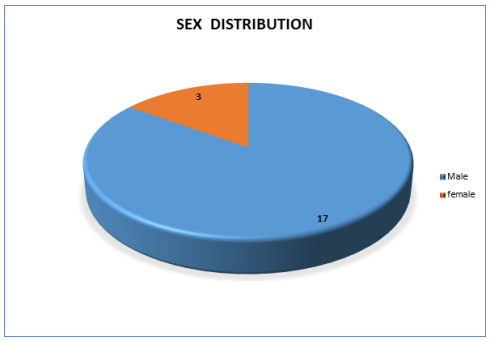

Fig 1: Sex distribution of the patients in our study.

The various clinical findings noted in our patients on being received in the emergency were as Table 2 below:

Table 2: Clinical findings of patients in our study.

Clinical Findings	No. of Patients
Peritonitis	12
Shock (Systolic BP < 90 mmHg)	6
Hemothorax	5
Evisceration	1
Pelvic Fracture	3

Peritonitis was the major finding noted in our patients (60%). 30% of patients were received in shock while as 5 patients (25%) had associated hemothorax. All patients in our study had single entrance wound visible on the torso.

The various Operative findings noted in our study were as Table 3 below:

Table 3: Operative findings noted in our patients.

Operative Findings	No. of Patients	Percentage
Liver Laceration	1	5%
Liver Laceration with major hepatic vascular injury.	1	5%
Small Bowel Perforation	10	50%
Splenic Laceration	2	10%
Renal Injury	1	5%
Pelvic Fracture	2	10%
Vertebral Fracture	1	5%
Colonic Fracture	3	15%
Diaphragmatic tear	2	10%

The total percentage does not equal to 100% because of multiple findings in some patients.

The various post operative complications encountered in our study are demonstrated in the figure below; Fig 2:

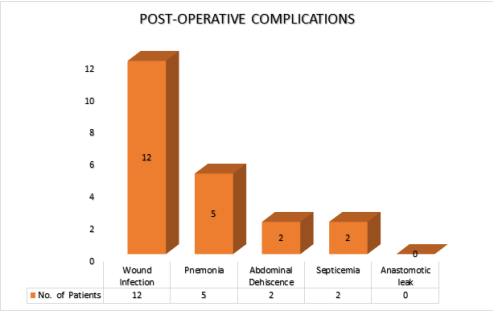

Fig 2: Showing post-operative complications encountered in our study.

Wound Infection was the most frequent complication encountered in our study. The graph below shows the pattern of bacterial flora isolated from wounds of patients in our study.

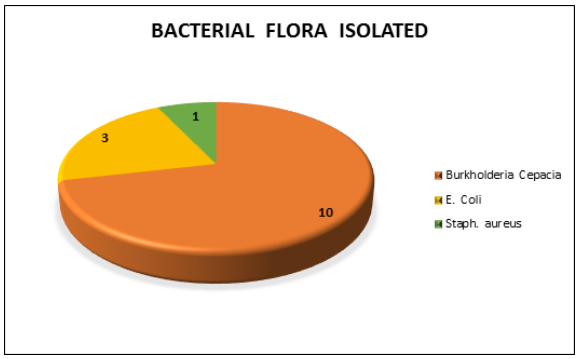

Fig 3: Bacterial flora isolated from infected wounds from patients in our study.

Three patients in our study died. Two died on Ist operative day in ICU and one died during surgery and had evisceration of bowel. Figure 4 below:

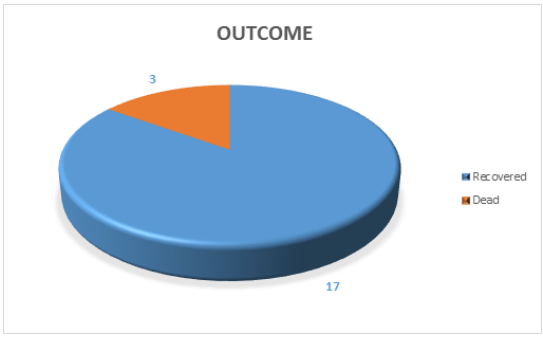

Fig 4: Showing outcome of patients in our study.

DISCUSSION:

Recently violence related issues have been reported with much higher rates in many countries of the world, a condition referred to as the "neglected epidemic"[3]. Kashmir although a peaceful land has also witnessed a huge number of violence related cases for the last 20 years. Though the domestic and interpersonal violence are not so common in Kashmir, weapon violence has become a serious concern for the health care providers in the valley particularly occurring during the control of the violent rioting mobs by the security agencies using different kinds of modern weapons, including conventional bullets. The factors which have an impact on survival of a patient in gunshot injuries like the pattern and nature of the wounds, condition and mode of arrival in the emergency are very different in gunshot injuries occurring during riot control than those occurring during other events like domestic or interpersonal violence. Besides these episodes of violence occurring in this region are marked by complete shut down of all routine work with no traffic plying on the roads resulting in a significant delay in fetching medical care to the injured patients. Thus providing a unique population group for study with unique circumstances.

While in our region, the main cause of gunshot injuries are the bullets fired by armed government personals on rioting mobs during episodes of civil unrest, this is in contrast with the rest of the world were vehicle hijacking, home robberies, civil strife, armed robberies etc are the main sources of weapon violence[4]. The mean age of patients in our study was 26.5 ± 8.9 years with majority of the patients being young between 20 – 29 years of age. 85% of our patients (17/20 patients) were males and 3/20 patients (15%) were females. This suggests that young males in their early and mid twenties are the particular victims of the gun shot wounds in this region. This corresponds with Wright and Kariya [5] who in their study found that the mean age of violence victimization is 28

years. 80 percent of the victims in their study were also males. Females are less frequently the victims of gunshot wounds in this region as they rarely become the part of the rioting mob. The most common presentation of abdominal bullet injuries in our study was peritonitis in 12/20 patients (60%) followed by shock in 6/20 patients (30%). 1 patient in our study had evisceration of small bowel through the exit wound 5/20 patients (25%) had associated hemothorax and 3/20 patients had associated pelvic fracture in our study. The increased presentation of peritonitis and shock in our study is probably because of the delay associated in reaching to the hospital because of non-availability of the transport during these situations. However only 6 patients in our study were received in shock as compared to 12 patients who had peritonitis. This is because all of the bullet hit patients in our study were of young age who had a well preserved cardiovascular status with no associated cardiovascular comorbidity. While in most of the places in the world with a high incidence of weapon violence the usual delay in transportation of victims to hospital is on average 30 minutes 6 11 , in our study most of the bullet victims were brought to our hospital later than 1 hour after the incident. Majority of patients in our study, 10/20 patients (50%) had small bowel perforation. 2 patients had liver trauma, one among them had major hepatic vascular injury. Repair of liver laceration with ligation of right hepatic artery was done. But both of these patients expired in ICU on 1st postoperative day. 2 patients in our study had associated splenic injury, 3 patients had colonic perforation, 2 had diaphragmatic tear, 2 had pelvic fracture, 1 patient had vertebral fracture and 1 had associated renal injury.

One of the patients with pelvic fracture and evisceration of small bowel died intraoperatively because of excessive bleeding from the fractured pelvic bones. Tabish et al in their study in 2004 also reported nonavailability of first aid, exsanguination, loss of golden hour and improper transportation as the prime causes of death in violence victims in this region.

Postoperatively, in our study we observed a high rate of infective complications. 60% of patients in our study developed wound infection, 2 patients developed abdominal dehiscence and 2 patients developed septicemia. Chamisa et al [4] in their study on gunshot injuries in African subcontinent reported only 10% rate of wound infection and 6% pneumonia. This high rate of infective complication in our study is both because of the increased transit time to the hospital as well as due to uncontrolled entry of emotionally charged mob in the postoperative wards. We noted that all patients who developed wound infection were infected with a gram negative organism. Burkholderia Cepacia was the most common gram negative pathogen isolated from wound cultures followed by Escherechia Coli. B. Cepacia is a catalase positive, non lactose fermenting gram negative bacteria that is usually is an opportunistic human pathogen that most often causes pneumonia in immunocompromised hosts with underlying lung diseases like Cystic fibrosis etc while as infection in immunocompetent individuals is rare. The rampant infection with B. cepacia in our patients being immuno- competent was an unusual finding and is probably because of the contamination at the time of primary injury and also due to uncontrolled Influx of agitated mobs in the postoperative wards.

CONCLUSION:

In contrast to the rest of the world were armed robberies and armed hijackings constitute the major cause for gunshot injuries, in this region the use of weapon for controlling rioting mobs on roads constitutes the primary cause of gunshot injuries. This all happens in a backdrop of complete shutdown of all traffic and business establishments which contributes to the significant delay in providing medical care to the victims resulting in significant morbidity of the patients.

We therefore observed that there is a strong need to provide all the major hospitals in this valley with well equipped trauma care facility centres so as to utilise the valuable time otherwise lost in transporting every such patient to a tertiary care hospital. We also strongly recommend that a hospital based registry for reporting all such gunshot injuries with respect to the place of the incident and their outcome be maintained so as to assess both the magnitude of this violence as well as to serve as a measure to improve the health care infrastructure in managing such kinds of injuries occurring in unusual circumstances in our population.

Compliance with Ethical requirements:

As the study was done as a fast track study during an episode of major civil unrest in the region of kashmir, a formal approval from ethical committee was not required. Although a formal consent for any kind of treatment was taken from all patients in the study

Conflict of Interest statement:

Mumtaz ud din wani, Azher Mushtaq and Malik Suhail Ahmad declare that they have no conflict of Interest.

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