Pattern Of Injuries Due To Rubber Bullets In A Conflict Zone

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Citation

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Abstract

Background: The low velocity rubber bullets were used in Indian Administered Kashmir by Indian police since May 2008 to control anti India protests. Our hospital received all kinds of injuries be they due to conventional bullets or tear gas shells or rubber bullets. We included injuries only due to rubber bullets and specifically studied pattern of injuries caused by them.Methods: We analysed 100 patients who had sustained rubber bullets from May 2008 -july2010 and were received by our hospital. We assessed severity of injury in relation to range from which the bullet was hit, anatomical region of the injury and final outcome. Severity of injury was established by injury severity score (ISS).
Findings: 100 patients 95 males and 5 females were included in the study who were proven to have sustained rubber bullet injuries. Average age ranged 12-60 years. Injuries were distributed randomly all along the body , the majority 80 patients (80%) had injuries in the limbs but those to head and neck 5 patients (5%), chest 8 patients (8%), abdomen 4 patients (4%) , back 3 patients (3%). 7 patients sustained injuries in multiple anatomic regions. 65 Patients (65%) had blunt injuries and 35 patients(35%) had penetration. Severity of injury was defined by the ballistic features of bullet, firing range and anatomic site of impact.Interpretation: The severity of injury whether blunt or penetrating caused by these rubber bullets is determined by resistance of body at the anatomic site of impact. Improper ranging with inaccuracy of rubber bullets with improper aiming can result in severe injuries sometimes ending in death. So this type of ammunition should never be considered safe in mob control.

INTRODUCTION

Rubber bullets were fired for the first time in Northern Ireland by British forces in riots control. In between 1970-1975 more than 55,000 rubber bullets were fired. The estimated death rate was estimated to be one death per 18,000 rounds fired. Since then rubber bullets are frequently used to control crowd in riots. The aim of using these rubber bullets is to inflict superficial painful injuries and controlling the demonstrators from further hostile activities but at the same time avoid serious injuries and deaths caused by conventional firearm injuries. These rubber missiles are cylindrical and blunt nosed with a muzzle velocity of 73m/s with a muzzle kinetic energy of 402J. The recommended safety fire range of these rubber missiles is >40m so as to avoid infliction of serious injuries. But inaccuracy of these rubber bullets makes it impossible to avoid hitting head, neck and chest region. Children and teenagers have been reported to sustain more severe injuries than adults particularly skull fractures and along with trunk injuries to lungs liver and spleen.

The State police also used these rubber bullets in Kashmir to control the crowd involved in anti India protests since May 2008 besides using conventional bullets, tear gas shells and pellet guns. We in this study studied only pattern of rubber bullet injuries. These rubber bullets have a tiny pointed tip with muzzle velocity of 73m/s. We studied 100 patients from May 2008 –July 2010 who were received by our hospital and who had sustained these rubber bullet injuries to establish the determining factors which generate these blunt and penetrating injuries and injury severity. We observed that the severity of these injuries is determined by elastic limit (resistance at the site of impact). Inaccuracy and instability of these rubber bullets along with improper aiming and range produces more severe injuries.

PATIENTS AND METHODS

100 consecutive patients who sustained rubber bullet injuries and presented to our emergency department at Bone and Joint Hospital Government Medical College Srinagar were taken up for study.

The patients were assessed in relation to age, sex, anatomic

location of injury, type of injury sustained (blunt or penetrating), injury severity by Abbreviated Injury Scale a standardised system of classification from 1 (mild) to 6 (fatal) and final outcome.

Figure 1

TABLE I -SEX DISTRIBUTION

	Male	Female	Total
Outpatient	39(41%)	3(60%)	42(42%)
Inpatient	56(59%)	2(40%)	58(58%)
Total	95	5	100

Figure 2

TABLE II -AGE DISTRIBUTION

AGE IN YEARS		
12-19	20-39	40 and more
59%	26%	15%

Figure 3

TABLE III- DISTRIBUTION OF INJURIES BY BODY REGION

	AREA INJURED					
Face	Head &Neck	Chest	Abdomen	Arm	Leg	Total
04	**06**	**11**	**07**	**17**	**55**	**100**

Figure 4

TABLE-IV Severity of Injury To Various Parts Of Body

	AIS 1-2	AIS 3-5
Head, neck, chest, Abdomen	22	06
Upper and lower limbs	57	15
All body areas	79(79%)	21(21%)

*AIS=Abbreviated Injury Scale

Figure 5

Table V- Specific Injuries

Nature of Injury	No. Of Patients
Facial fractures	02
Skull fractures without major brain injury	01
Skull fractures with major brain injury	00
Major brain injury without skull fracture	00
Serious eye injuries	00
Rib fractures	04
Upper and lower limb fractures	06
Lung contusions	01
Splenic injury	00
Liver injury	00
Gut injury	00
Tendon injury	01
Scalp laceration	03
Facial laceration	O2
Circular imprint	03
Unspecified bruise or abrasion	66

RESULTS

Of 100 patients with proven rubber bullet injuries who were taken up for study, there were 95 males and 5 females with an age range of 12-60 years (Table II). The injuries were randomly distributed all over the body with 20 patients having injury at more than one place. The injuries were mostly located in the upper and lower limbs (72%),head neck chest and abdomen(28%) (Table III).In accordance with the AISS 79% of patients had AIS of 1-2 and 21% had AIS of more than 2.In our study no patient had AIS more than 5.

42 patients (42%) with mild injuries were treated on outpatient basis and 58 Patients (58%) where admitted. Surgical procedure under general anaesthesia was done in 21 patients with injuries to upper and lower limbs(86%) chest, head, neck, face and chest (14%)(Table I). Patients with AIS 1-2 where admitted for 1-5 days, where as those with AIS more than 2 where admitted for 7-28 days.

Type of rubber bullet could not be ascertained in most mild injured patients from history, skin marks. In most patients with moderate and severe injuries rubber bullets were retrieved.

Firing range could not be established accurately by history obtained from the injured themselves or from their attendants. However in 22 patients with moderately severe injuries, contusion, penetrating injuries and bone fractures suggest bullets were fired from the close range.

Injury to the upper lower limbs and chest generally were severe than injuries in head, neck and abdomen. Most injuries to head, neck and chest were blunt causing

superficial contusion, swelling with or without superficial abrasion. More severe injuries were seen in the lower limbs causing deep lacerations or closed and open fractures.

The fractures were humerus 1, metacarpal 2, patella 1, proximal tibia 1 and fibular neck 1. Three patients were having open knee lacerations. All Patients with open bony fractures and open knee lacerations where operated on the day of admission.

Injuries to head, face and neck (10%) were less severe and were more frequently blunt causing superficial laceration of skin. In 1 patient hair line non depressed fracture without any collection inside was noted on C T scan. All patients with injuries to head and face were having GCS of 14-15 on admission. All these patients were managed conservatively and discharged after repeat scan was done on discharge.

Injuries to face were blunt causing periorbital, edema, bruising, superficial or deep laceration. One patient had a fractured zygoma and one was having a fracture of the maxilla.

Of the 11 injuries to the chest most were blunt inflicting only superficial lacerations and contusions. More severe blunt injury was seen in one patient causing skin penetration with 2 rib fracture and lung contusion without penetration into pleural cavity. The patient responded to conservative treatment in next few days. C T scan revealed no pneumothorax, hemothorax, pericardial tamponade in the patient.

There were 7 injuries to abdomen in whom USG and C T scan was done there was no penetration in any case. Patients with trauma abdomen were observed closely and repeat scan was done which was found normal.

Figure 6

Figure 1 – rubber bullet retrieved

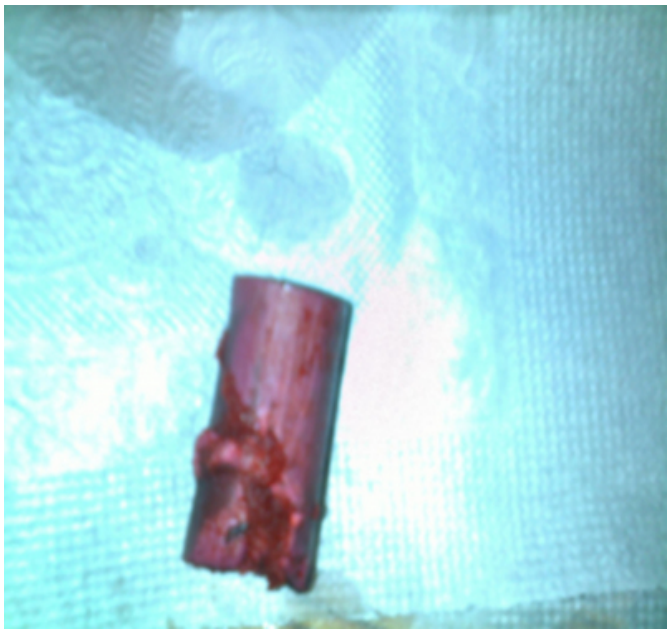

Figure 7

Figure 2- X- ray of the patient

Figure 8

Figure 3 and 4- Entry wound due to rubber bullet

Figure 9

Figure 5- X- ray of the patient of figure 4

DISCUSSION

Both conventional ammunition and rubber bullets were used by Police in Kashmir in crowd control. Our study shows that must affect penetration and severity of injury inflicted by rubber bullet are elastic limit, viscosity or both of the body area that was injured. The results showed that more men were injured suggesting more of men population were involved in the outdoor protests. This view was supported by visual clips of media. The age of people with inflicted rubber bullet injuries ranged 12 to 60 years with majority in teenage group (59%). In our study maximum number of patients sustained injuries to limbs (72%). The injuries caused by these rubber bullets in head, neck and chest region were more often blunt causing few fractures and lacerations which was supported by the fact police aimed on hitting the lower limbs. There were no fatal injuries in the study.

Rubber bullets are made so that their low kinetic energy is imparted to the victim at the so called safe range of 40 meters when aimed at lower limb. This low ballistic coefficient results in unstable flight of missile which tends to tumble and over end leading in several of our cases- to markings showing that the messily had struck the skin side ways. Also the low coefficient results in inaccurate erratic flight which makes it difficult or impossible to avoid hitting the face, head or upper torso.

Tissue damage produced by rubber bullets is largely to attributable to direct compression or crushing type mechanism of tissue by blunt nose of bullets and to the shock wave generated by the impact which creates laceration and fracture distant from area of impact. When strain is applied by blunt rubber bullet deforms tissue beyond its elastic limit or viscosity penetration of the missile into body takes place.

The need for authorities to control the civil disturbances is well acknowledged. The techniques used by police forces to deter such activity must be effective but at the same time should avoid serious injuries. To prevent serious injuries and fatalities, the anatomical target should be limited to lower limbs and the minimum firing range should be 40 meters.

COMPARED WITH THOSE CAUSED BY RUBBER

INJURIES CAUSED BY PLASTIC BULLETS

COMPARED WITH THOSE CAUSED BY RUBBER

BULLETS

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