Management and pattern of pellet gun injuries in war conflicted Kashmir Valley, India

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ABSTRACT

Background: The pellet gun is a shot gun weapon which is used by law enforcement agencies to maintain law and order in conflict zones whenever need arises. Sometimes, these minute sized pellets may lead to grave injuries to vital structures of the body which may sometimes led to permanent disability. The objective of this study was to investigations and manages these fatal injuries in war conflicted valley.

Methods: The prospective study conducted in a tertiary care hospital of Government Medical College, Srinagar, Jammu and Kashmir, India at the time of civilian unrest in 2016 and onwards when thousands of people were injured with pellets by security agencies.

Results: Maximum number (67.1%) of patients had injuries to eyes and face, among the total number of patients 69 (17.2%) of patients had abdominal injuries. CECT abdomen showed pellets in all 69 (100%) of patients, pellets in gut lumen in 48 (69.5%) of patients. In the abdominal group, 40 patients underwent laparotomy which showed hemoperitoneum in 49 (71.01%), pneumoperitoneum in 6 (8.69%) of patients.

Conclusions: Pellet gun weapon has become a common arsenal to suppress the unarmed civilian agitation which may lead to fatal injuries to vital structures of body, where prognosis remained poor despite of best available treatment.

Keywords: Conflict, Compressing gas, Civilians, Cartridge, Pellet gun, Pellet balls

INTRODUCTION

The Kashmir valley which is said to be the paradise on earth is unfortunately surrounded by war of conflict with frequent unarmed agitations and frequent use of pellet gun and other lethal weapons by law enforcing agencies from time to time has killed thousands of civilians and left many more injured and disabled.¹ Pellet gun is a form of short gun with a 20 inch barrel operating at low pressures as low as 50 atmospheres.² A pellet cartridge contains hundreds of pellets which use compressed air and expanding gases to propel projectiles. Air weapon injuries commonly involve teenage boys, and the damage to body can be determined by the velocity and the distance from which pellets are.³ The number of pellets fired in single shot is as high as 500 in number and pellets while released from the gun don’t have a predictable trajectory and can cause unexpectedly fatal injuries.⁴
METHODS

This study was conducted in a tertiary care hospital of Government Medical College, Srinagar, Jammu and Kashmir, India at the time of civilian unrest in 2016 for duration of one year from July 2016 to June 2017 when thousands of unarmed people were injured with lethal pellets by security agencies. In this study, 400 hundred patients were included. All pellet victims were received in the casualty with immediate attention to airway and any excessive bleeding. After initial stabilization and resuscitation, the patients who were send for Focussed Assessment Sonography for Trauma (FAST Scan) done in the emergency room by the radiologist and after resuscitation were sent for a CECT chest, abdomen and pelvis and radiological examination of other parts of body as required. Patients were classified on the basis of distribution of pellets on body and radiological investigations. Injuries to eyes and limbs were shifted to their respective departments for specialized treatment. Patients with pellet injury to abdomen were managed in surgical department and were operated on the basis of repeated clinical examination, hemodynamic instability and CECT based evidence of haemoperitoneum or pneumoperitoneum.

RESULTS

Maximum number (67.1%) of patients had injuries to eyes and face, chest was involved in 9 (2.25%) of patients. Among the total number of patients 69 (17.2%) of patients had abdominal injuries (Table 1).

| Anatomical site          | Number | Percentage |
|--------------------------|--------|------------|
| Eyes and face            | 270    | 67.1%      |
| Head and neck            | 32     | 8%         |
| Extremities              | 24     | 6%         |
| Chest                    | 9      | 2.25%      |
| Abdomen                  | 69     | 17.2%      |

CECT abdomen showed pellets in all 69 (100%) of patients in parietal wall, pellets in gut lumen in 48 (69.5%) of patients, haemoperitoneum in 49 (71.01%) and pneumoperitoneum in 6 (8.69%) of patients (Table 2).

| CECT finding of abdomen | Number | Percentage |
|-------------------------|--------|------------|
| Pellets in parieties    | 69     | 100%       |
| Intrabdominal pellets   | 62     | 89.8%      |
| Pellets in gut lumen    | 48     | 69.5%      |
| Pellets in solid organs | 26     | 37%        |
| Haemoperitoneum         | 49     | 71.01%     |
| Pneumoperitoneum        | 6      | 8.69%      |
| Retroperitoneal haematoma | 2    | 2.89%      |
| Solid organ lacerations | Nil    | -          |

Table 3: Intraoperative findings with management.

| Operative findings                               | No. of patients | %  | Procedure performed                     |
|-------------------------------------------------|-----------------|----|-----------------------------------------|
| Bowel perforation                                | 10              | 25 | Closure of small bowel perforations     |
| Serosal breach only                              | 34              | 85 | Closure with lavage                     |
| Mesenteric hematoma                              | 2               | 5  | Peritoneal lavage                       |
| Gastro colic hematoma                            | 1               | 2.5| Ligation of bleeding vessel in omentum  |
| Spleenic hilar injury                            | 1               | 2.5| Splenectomy                             |
| Serosal breach liver                             | 3               | 7.5| Hemostasis of bleeding pellet wounds    |
| Mesenteric hematoma with unhealthy bowel         | 4               | 10 | Resection anastomosis of small bowel    |
| No significant finding                           | 5               | 12.5| Negative exploration                    |

In the abdominal group, 40 patients underwent laparotomy which showed serosal breach in maximum number 34 (85%), which was manages with closure and lavage. Bowel perforation was seen in 10 (25%), which was treated with primary closure. 4 (10%) of patients had mesenteric hematoma with unhealthy bowel who underwent resection anastomosis of small bowel as blood supply was compromised due to haematoma formation and color changes in bowel. Spleenic hilar injury was seen in 1 (2.5%), who underwent splenectomy (Table 3). Figure A, B, C and D showed multiple pellets over back with oozing of blood, X-ray chest with multiple pellets, and pellet in descending colon respectively.

Figure 1: A) Multiple pellets over back with oozing of blood. B) Showed pellets over back who had pellets in liver and bowel lumen on exploration.
In this study, 40 patients underwent laparotomy with multiple findings with serosal breach in maximum number of patients and negative laparotomy in 5 (12.5%). In a study conducted by Mushtaque M et al, showed negative laparotomy in 4 patients with pellet injuries to abdomen.9 In this study, 29 out of 69 were managed conservatively despite of CECT documented pellets in parietal wall and abdominal cavity including bowel wall. In this study, 4/40 patients underwent delayed laparotomy after 24 hours.

In a study conducted by Hegazy TO et al, had 4/23 patients operated after 24 hours and all had hollow viscus perforations.10 In this study, 44 patients had involvement of bowel with small bowel in maximum number, followed by multiple mesenteric haematoma, and involvement of solid visera (liver, spleen). In a study conducted by Chamisa I showed small bowel involvement in (59%), colon (37%), liver (25%) and stomach (22%) and the injuries to small bowel being perforations and tangential lacerations, requiring resection (26%) and simple closure (74%).11 A study conducted by Wani ML et al, has reported a number of vascular injuries due to non-lethal weapons like pellets and tear gas shells in a conflict zone.12 Most of the patients were anxious in the follow up that the embedded pellets in their body can kill them for which psychiatric counseling was needed to relieve their anxieties.

CONCLUSION

Pellet gun like weapons are as harmful as other firearm weapons and should be immediately banned on humans by court of law as this weapon can cause lethal injuries especially to vital structures to our body which can lead to permanent disability, besides the word so called non-lethal weapon for pellet gun should be changed to lethal weapon and should be not used by law enforcing agencies in future.

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