

Plastic baton round injuries

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Objectives: To review the injuries resulting from a new plastic baton round.

Methods: Review of case notes of patients presenting with injuries caused by plastic baton rounds over a four month period in Northern Ireland.

Results: Twenty nine patients were identified, 28 with 30 injuries were included in the study. Eighty nine per cent were male; the average age was 24.3 years. Seven patients required admission. There were no fatalities. Five injuries were to the upper limbs and 16 to the lower limbs. Three patients sustained pulmonary contusions. There were no head injuries.

Conclusions: Although the numbers in this study are small it should be noted that no patient suffered a face, neck, or head injury. This is in contrast with previous studies in which up to 41.4% of attendances were for face, neck, or head injuries. In this study there were seven injuries to the trunk. Of the 14 deaths attributable to plastic baton rounds in Northern Ireland, all have been the result of head or chest trauma. The use of plastic baton rounds has decreased and, while a reduction in head injuries is noted, potentially serious chest injuries are still occurring. It is vital that guidelines on firing are adhered to. A large proportion of people who have been struck by plastic baton rounds do not attend an accident and emergency department and therefore doctors must be aware of patients with potentially serious injuries presenting late.

In June 2001 the Home Office authorised the use of the plastic baton gun as “a less lethal option” by police forces in the United Kingdom. In Northern Ireland the security forces have been using the plastic baton round, and its predecessor, the rubber bullet in civil disturbances since 1970. A new variation of plastic baton gun the L104A1 and the L21A1 baton round were introduced for use in Northern Ireland in May 2001 with the removal of previous models. The new weapon also has an optional XL118E3 optical site for aimed firing. Up until the present date this weapon has been issued to eight mainland police forces including the London Metropolitan Police, the Merseyside Police, and the Stirlingshire Police.

The Defence Evaluation and Research Agency division of the Ministry of Defence carried out extensive test firing of the weapon. They concluded that it was essentially safer than its predecessor.¹ This was because of improved accuracy and flight dynamics of the baton round. However, they also concluded that for head wounds in specific circumstances it was likely to increase the chance of severe neurological injury. The new baton round is essentially of similar composition (polyvinyl chloride) and dimension (10 cm×3.7 cm) to its predecessor. However, it is lighter (98 g compared with 133 g) and has a greater muzzle velocity (161 mph compared with 140 mph—measured at six feet from the gun barrel). It delivers a kinetic energy of 244 joules upon striking its target.

In Northern Ireland every baton round discharged by a member of the Police Service of Northern Ireland is the subject of a statutory investigation by the office of the Police Ombudsman for Northern Ireland. There is no equivalent requirement for the British Army in Northern Ireland or for police forces in the rest of the UK. This review, which aims to highlight the nature of injuries produced by the new baton round, covers the period May to August 2002. Annually this is known as the “marching season” in Northern Ireland and usually witnesses an increase in sectarian tension and civil disorder.

METHODS

Patient records were collected retrospectively from all accident and emergency departments in Northern Ireland. Only three departments reported seeing patients with injuries said to be caused by plastic baton rounds. These were two hospitals in Belfast, the Royal Victoria Hospital and the Ulster Hospital and one in Portadown—Craigavon Area Hospital. As a further means of checking on the total number of injuries inflicted from baton rounds fired in Northern Ireland discussions were held with the office of the Police Ombudsman for Northern Ireland and The Independent Assessor of Military Complaints Procedures.²

All sets of notes collected were reviewed and the following data were collected—age of patient, sex of patient, site of injury, and whether or not the patient required hospital admission. For all patients an injury score was then calculated, using the abbreviated injury scale.³ Injuries are ranked on a scale of 1 to 6, with 1 being minor, 3 serious and 6 an unsurvivable injury. This represents the “threat to life” associated with an injury and is not meant to represent a comprehensive measure of severity.

RESULTS

The notes from 29 patients were collected from the three A&E departments. One patient was excluded as he gave two different accounts of how he sustained his injury at two separate attendances. The remaining 28 patients sustained 30 injuries attributable to baton rounds (two patients were struck on two contiguous regions of the body by a single plastic baton round or by more than one plastic baton round). There were 25 male and three female patients. Of the 28 patients, seven patients required hospital admission. There were no fatalities or intensive care unit admissions. The ages of the patients ranged from 13 years to 47 years with a mean of 24.3 years.

Of the seven patients admitted, three had sustained a pulmonary contusion and required supplemental oxygen, nebulisers, and overnight observation with outpatient review.

Table 1 AIS scoring of injuries (no injuries in categories 4–6)

Body region	AIS			Total	Percentage
	1	2	3		
Head/face/neck				0	
Thorax	4		3	7	23.3
Abdomen	1			1	3.3
Upper limb	1	3	1	5	16.7
Lower limb	15		1	16	53.4
Not specified				1	3.3

One had a soft tissue injury to the leg and was felt to be at risk of developing a compartment syndrome. Three had sustained fractures, two to the upper limb, both of which required internal fixation. One of these was a compound comminuted elbow fracture. The patient with the serious lower limb injury had sustained a compound calcaneal injury. Two patients sustained pretibial lacerations that required up to four weeks' outpatient follow up and treatment. No patient presented with an injury to the head, face, or neck during the study period. Table 1 shows the AIS scoring of injuries.

DISCUSSION

Northern Ireland occupies a unique position within the UK because of its history of civil unrest over the past 30 years. The security forces in Northern Ireland have used plastic baton rounds since their introduction in 1973. In the rest of the UK they have been available for use by police forces since 1988 but had never been used until 2002, after the authorisation of the Home Office to use them as a less lethal alternative to firearms. These missiles are intended to cause painful, non-serious, or life threatening injuries thus dissuading people engaged in activities of civil unrest. At the time of writing the use of plastic baton rounds has been reported twice on the UK mainland. The first occasion was in north Wales in February 2002 and the second in Surrey in April 2002.

Clinically the mode of injury is essentially blunt trauma. Because of the small cross sectional area and high energy delivered this has the potential to cause serious injury. The usual superficial injury seen on a patient struck by a plastic baton round is a roughly 4 cm diameter circular abrasion with an area of surrounding contusion (see fig 1).

Ministry of Defence guidelines for the use of baton rounds have stated "That they are aimed and fired at selected individuals, not indiscriminately" and that "They are to be aimed so that they should strike directly (i.e. without bouncing) the lower part of the body (i.e. below the ribcage)." These guidelines also state that firing should not take place at a range of less than 20 metres unless "...there is an immediate and serious risk of loss of life or serious injury that cannot otherwise be countered."

The numbers in this study are small but it is important to note that no patient suffered a face, neck, or head injury. The four previous studies by Sheridan and Whitlock,⁴ Roche,⁵ Ritchie,⁶ and Steele⁷ respectively had 40.5%, 41.4%, 23%, and 19.2% of patients with head, face, or neck injuries. In this study 26% of injuries were truncal and the potential seriousness of these injuries should not be overlooked. There was no statistical difference between the areas of the body hit when compared with the last study by Steele until we looked at the number of head injuries (using Fisher's

**Figure 1** Abrasion from baton round.

exact test). Here there was a significant difference in this group ($p = 0.032$) that would be expected with no injuries in our study group. Of the 14 deaths attributable to plastic baton rounds in Northern Ireland, all have been the result of head or chest trauma and therefore reductions in injuries to these areas is most important. Three of our patients did present with pulmonary contusions, easily identifiable as discrete circular areas of increased density on the chest radiograph.

Most injuries were to the upper or lower limbs. While most of these were uncomplicated soft tissue injuries we did see a number of more serious compound and/or comminuted fractures, two of which required internal fixation. With unrest growing around the world and police forces from America to Italy using plastic baton rounds it almost seems inevitable that these missiles will come more to the fore in Britain. It is therefore important to make the point that the risk of death or severe injury is very much reduced if the impact on the body is below the rib cage or on limbs only.

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REFERENCES

- 1 Defence Scientific Advisory Council. Statement on the comparative injury potential of L5A7 baton round fired from the L104 Anti-riot gun using the battle-sights, and the L21A1 baton round fired using the X1 18E3 optical sights. <http://www.publications.parliament.uk/pa/CM200102/cmhansard/vol021030/text/21030w02.htm>.
- 2 McDonald JO. Independent Assessor of Military Complaints Procedures. A Review of Military Use of Baton Rounds in Northern Ireland. 1 Jan. 2001–31 Oct, 2002.
- 3 Association for the Advancement of Automotive Medicine. AIS: 1990 revision, 1998 update. Des Plaines, IL: Association for the Advancement of Automotive Medicine, 1998.
- 4 Sheridan SM, Whitlock RH. Plastic baton round injuries. *Br J Oral Surg* 1983;21:259–67.
- 5 Roche L. Injuries caused by plastic bullets compared with those caused by rubber bullets. *Lancet* 1983;i:919–20.
- 6 Ritchie AJ. Plastic bullets: significant risk of serious injury above the diaphragm. *Injury* 1992;23:265–6.
- 7 Steele JA, McBride SJ, Kelly J, et al. Plastic bullets in Northern Ireland: experiences during a week of civil disturbance. *J Trauma* 1999;46:711–14.