

## Pattern of Gunshot Injuries as seen at the National Orthopaedic Hospital, Enugu: January 1999 December 2004

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### Abstract

**Background:** Civilian gunshot injuries are common in our environment. Hospitalisation for this appears to be on the increase especially around the periods of general elections, but studies on the peri-election pattern are lacking. This report examines the pattern of gunshot injuries seen at an apex trauma centre spanning the periods of two general elections.

**Patients and Methods:** This hospital based retrospective study reviewed all admissions into the trauma unit of the National Orthopaedic Hospital, Enugu over six years (January 1999 December 2004). The sources of data were the trauma unit admission registers, nurses' report books, and the case notes of the patients. Simple arithmetic analysis was used.

**Results:** Of 6,765 trauma admissions in the period, gunshot injuries accounted for 306 (4.5%). In 1999 and 2003 they accounted for 6% and 8% of all trauma admissions respectively. The overall pattern over the six year period shows the incidence rises from January to a peak in May. However in the election year 1999, a progression in incidence immediately following May (the month of hand-over) rising to a peak in August was noted.

**Conclusion:** A definite increase in presentation of gunshot injuries exist in the years of general elections.

**Keywords:** gunshot injury, election year

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### Introduction

The National Orthopaedic Hospital, Enugu is an apex trauma centre having the south-east, south-south geopolitical zones, and parts of Benue and Kogi states as the catchments area. Several studies have documented the epidemiology, management and outcome of gunshot injuries (GSI) in various parts of Nigeria.<sup>1-5</sup> The incidence has been noted to be on the increase and it has also been suggested that elections play a role in the incidence, but studies on this are lacking.<sup>3, 5</sup> May 1999 was the month of hand over by the military in Nigeria. This study was

undertaken to contribute data on the pattern of GSI in this environment, indicate if there is indeed a rise in presentation of GSI in our centre during election periods, and make recommendations.

### Patients and methods

A retrospective study was undertaken making use of the admission registers of the trauma unit in the period January 1999 December 2004. This was supplemented with data from the nurses' report books. All admissions were reviewed and those with gunshot injuries analysed. One hundred and fifty five case notes of patients were available and subsequently reviewed. Data in the period in question was used to investigate the gender, age range, body region, and seasonal pattern of gunshot injuries in the population with particular interest in the election years of 1999 and 2003. Excluded from the study were all patients brought in dead (they were not registered in our trauma records), and January 2004 data as it was incomplete. Simple arithmetic analysis of the data was used.

### Results

In the period 6,765 patients were admitted into the trauma unit; 306 were gunshot injuries (4.5% of all admissions). There were 297 male and nine female giving a male: female ratio of 9.7:1.

The weapon used more frequently was a shotgun (a low velocity missile with multiple pellets).

### Age:

The age range was eight to 88 years. The mean age was 34.6 years. The extremes of age were least affected. Only two incidents were recorded in patients in the first decade of life. The peak lay in the 3<sup>rd</sup> to 4<sup>th</sup> decades.

### Body Region (Table I):

The lower limb was the most frequent body region involved. The perineum was rarely involved, and only in

males. Two cases each involved the penile shaft and buttocks respectively. In the head there was a predilection for the lower face region. Most of the injuries of the lower limb were below the knee and when fractured often resulted in a large defect requiring major reconstruction.

**Table 1. body region affected**

BODY REGION	NUMBER	PERCENTAGE
Head/neck	32	10.5
Lower limbs	131	42.9
Upper limbs	79	25.9
Trunk (chest/abd-omen/perineum)	63	20.7
TOTAL	306	100.0

**Pattern of admissions:**

For the years under review the fewest admissions for all causes into the trauma unit was in the month of February and the most admissions in April. Peak months of admission were April, September, and December. All the peaks followed festive periods (Figure 1). For GSI in the years under review the fewest admissions were in the month of January, and the most admissions in May. A surge was noted in December (Figure 2). In 1999 however admissions for GSI began to increase from the month of May (immediately following the hand over) to peak in August (Figure 3). In the following year 2000 the pattern of admissions reverted to the peak in May and a surge in December (Figure 4).

In the years under review GSI accounted for 4.5% of the total admissions into the trauma unit. In the election years of 1999 and 2003 GSI accounted for 6% and 8.2% of all trauma admissions respectively. In 2000 and 2004 the years immediately following elections GSI accounted for up to 5.7% and 2.7% of all trauma admissions respectively.

Figure 1: Total trauma unit admission by month 1999-2004. Note the peaks in April and September

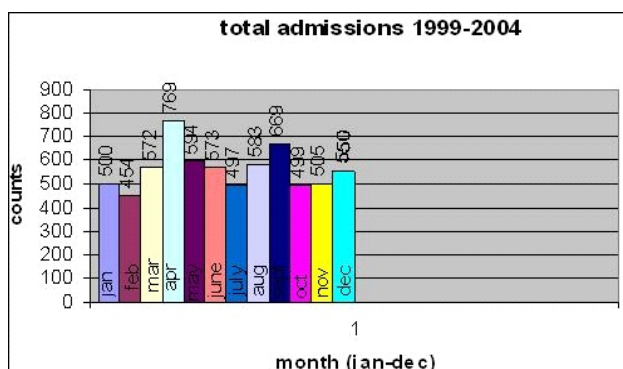


Figure 2: Gunshot injuries by monthly disposition 1999-2004. Note it is least in January, rises to peak in May and having a surge in December

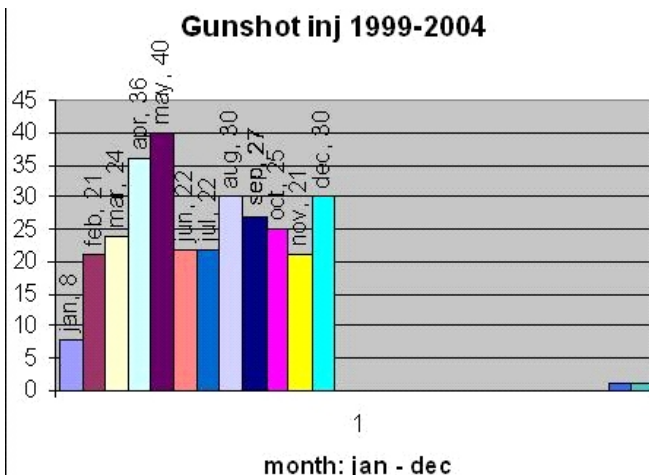


Figure 3: Gunshot injuries in 1999 by monthly disposition. Note the surge from May and the peak in August

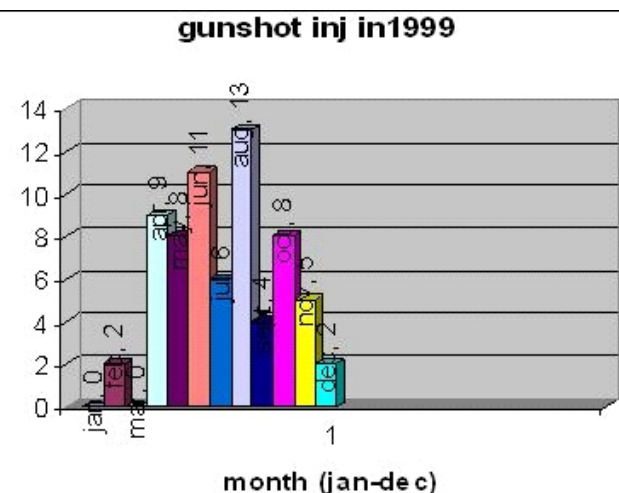
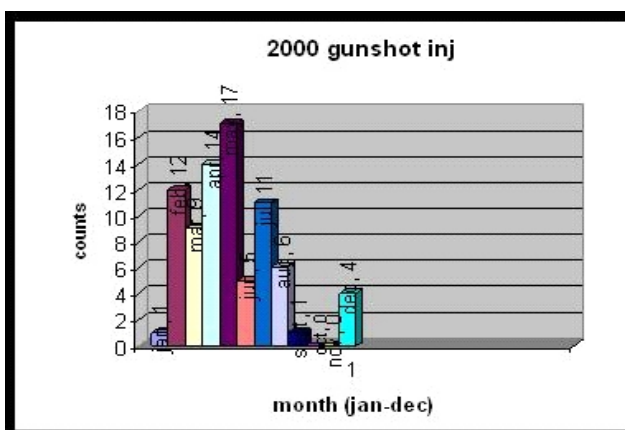


Figure 4: Gunshot injuries in 2000 by monthly disposition. Note the return of a peak in May, the elimination of the 1999 August peak, and the December surge.



## Treatment

The treatment given involved emergency resuscitation of those haemodynamically unstable, wound debridement and dressings in the ward. Three patients underwent emergency tracheostomy, and 133 patients (85%) had debridement. Serial debridement was uncommon, accomplished in seven patients.

Twelve patients underwent emergency limb fasciotomies. Fracture stabilisation was by a plaster cast in 45 patients (29%), external fixators in 10 (6%), Kirschner wires in five, Kuntscher nails in four, and interdental wires in one. No internal fixation was done as part of the initial surgery. Three patients had lower limb amputation; one above knee. One had orchidectomy following perineal injury.

Delayed primary wound closure was achieved in 23 patients; primary closure was done in the face in one patient. Twenty four patients had secondary wound closure, 25 had skin grafts, and 11 had flaps to cover soft tissue defects. Nine left on the same day.

## Discussion

This study appears to agree with assertions that GSI are on the increase.<sup>3,4</sup> A previous study from this centre<sup>3</sup> spanning January 1992 to January 1998 noted only 77 patients with gunshot injury as against 306 in our series spanning six years, indicating a marked increase in patients presenting with GSI. That study did not however check for seasonal variations or the proportion of trauma admissions GSI formed. Our series does not include gunshot injuries seen in other peripheral hospitals; we believe most gunshot injuries in Nigeria are brought to, and managed in tertiary health institutions. This is based on the experience in centres across the nation.<sup>4-6</sup>

The male preponderance of 9.7:1 differs from the findings in the western part of the country with 16.8:1<sup>4</sup> and 22.1:1<sup>6</sup>. This may appear to represent a regional difference. The Ilorin study<sup>4</sup> however had an aspect of it with a retrospective analysis of patients. This had a male preponderance of 9:1 which is similar to ours. The difference may be as a result of the retrospective nature of the work. The age pattern is similar to previous studies.<sup>3,4,6</sup> Low velocity missiles are also reported as the more frequent weapon used. The finding of lower limb predominance is consistent with previous findings in the same environment,<sup>1,3</sup> and elsewhere in the country<sup>4,6</sup> but differs from work outside the country.<sup>7,8</sup> It may be that the assailants in our environment aim at immobilising rather than slaying their victims. It may also be that those shot in

the head or chest and die are not brought to the hospital. This study excludes those brought in dead. Other studies in Nigeria have similarly excluded this group.<sup>3,4,6</sup> The incidence of trunk injuries is higher in this study than in previous work in this environment.<sup>3</sup> It may be that patients with such injuries were previously sent to the university teaching hospital located in the same city, where there are cardiothoracic as well as general surgeons on call. In studies from other Nigerian teaching hospital set ups the incidence is higher.<sup>4,6</sup> In this study GSI accounted for 4.5% of all admissions. Other workers have noted 3.6%<sup>9</sup> and 3.8%<sup>10</sup> however these figures come from centres that admit non surgical emergencies, which is an uncommon occurrence in this centre. The non surgical emergencies may account for the lower percentages of GSI in these centres.

Election year related GSI have been noted elsewhere,<sup>4,6,11</sup> but in the industrialized world election violence is suicide related and on a very low scale.<sup>11</sup> Solagberu in his study of GSI in Ilorin, Nigeria involving the year 1999 had noted a rise in incidence.<sup>4</sup> He however attributed it solely to improved accuracy of prospective studies over retrospective studies. We believe election year increase in GSI was partly responsible for his findings. The exclusion of January 2004 data may have contributed to the low (2.6%) figure for 2004. However January is not a peak month for GSI in our environment.

No difference in management protocol was detected in the election years. The treatment given is also quite similar to that which was recorded in previous work done in this environment.<sup>3</sup> A large number of those with injuries in this study did not have serial debridements. This may have been due to financial constraints on the part of the patients as after the initial emergency treatment they are expected to pay prior to any other intervention. The preferential use of plaster casts to external fixators in this study was from a lack of external fixators in the hospital at the time under study; external fixators are the preferred mode for ease of soft tissue management. The decision to close low energy wounds to the face primarily is most probably because of the excellent vascularity of the face with expected good wound healing.

During election periods apparently a lot of small arms are available for political thugs. It is probable that following their "lay-off" in the period immediately following elections their weapons are used for armed robbery and other social vices, which resulted in the rise in incidence of GSI from May 1999, reaching a peak in

August 1999. May 1999 was the month the civilians took over government from the military. Disturbingly by the next general election year of 2003 the percentage of GSI surged to 8% of all trauma admissions.

### Conclusion

A definite increase in presentation of GSI exists in our trauma unit during the periods of general elections. Measures such as enforcement of legislation on firearms

need to be taken. Hospital facilities and personnel also need to be beefed up to handle such cases.

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Legend