

Outcome of Extremity Gunshot Injuries at Lagos University Teaching Hospital, Lagos, Nigeria

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SUMMARY

Background: Gunshot injuries remain a common reason for prolonged hospital stay.

Objective: High morbidity due mainly to infections of soft tissue and bone.

Methods: This is a three year prospective morbidity and mortality study of cases of extremity gunshot injuries that presented at Lagos University Teaching Hospital (LUTH) between 1st January 2000 and 31st December 2002. LUTH is the largest tertiary hospital in Lagos State. This study aims to assess morbidity and mortality due to increasing complications associated with civilian gunshot injuries.

Results: Two hundred and forty patients with extremity gunshot injuries were studied excluding those brought in dead (BID). Most (95%) of the patients were males. Age group 21 – 40 years accounted for most cases (52.5%) of the victims of gunshot injury. The commonest complication was wound infection (20%). Chronic osteomyelitis occurred in 11.9% of those with fractures.

Conclusion: The commonest complications were related to infections which resulted in considerable morbidity, Mortality was 5% and related to associated abdominal injuries.

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KEY WORDS: Gunshoot injuries, Extremity, Lagos, Nigeria.

INTRODUCTION

High morbidity is associated with increasing incidence of gunshot injuries world wide.¹⁻⁵ Gunshot injuries exert enormous toll on both the individual and society. The commonest complication is wound infection with reported rates ranging from 1.5 to 8%^{6,7}.

Mortality from gunshot injury has been severally reported to be 5-25%^{8,9}. Forty thousand people die every year from gunshot injury in the USA¹⁰. These deaths are surely avoidable if the incidence of violent crimes can be reduced. Gunshot injury is a common reason for prolonged hospital stay leading to a considerable cost in patient care. It leads to loss of productivity, attendant pain, suffering and low quality of life^{11,12}. All these in the setting of an impoverished economy like ours with limited and grossly inadequate resources allocated to health, calls for a

closer study of this type. It is thus the aim of the authors to look at the burden of morbidity and mortality from gunshot injuries to the extremities.

PATIENTS AND METHODS

Lagos University Teaching Hospital (LUTH) is one of the oldest tertiary hospitals in Nigeria. It receives referrals from the plethora of private and public hospitals in highly populated Lagos.

All cases of extremity gunshot injuries from 1st January 2000 to 31st December 2002 were studied, those brought in dead (BID) were excluded. A protocol with pre-determined information on injury complications and outcome was administered by the authors. Such information as wound/bone infection, associated residual nerve/vascular injuries, fracture non-union, limb amputation, duration of hospital stay and death were elucidated.

Two hundred and forty patients with extremity gunshot injuries at the Accident and Emergency or the surgical outpatients' clinic of our hospital were included. They were documented, resuscitated, evaluated and treated. The treatment included open reduction and internal fixation, external fixation and cast application. The complications during the course of management and outcome were recorded. Data was analysed using Epi-info software version 6.04.

RESULTS

The modal class was 31 – 40 years. Age range was 11-65years and mean age is 36.75years. Two hundred and twenty eight (95%) of the study population were males. Further details are as shown in table 1.

Forty-five percent of patients in this study stayed less than 2 weeks in the hospital as shown in table 2. Five percent of them stayed for between 8 – 16 weeks and 2.5% stayed for more than 16 weeks.

As shown in table 3 the commonest complication of gunshot injury was wound infection which occurred in 20% of patients. Chronic Osteomyelitis occurred in six patients representing

Table 1: shows age and sex distribution of patients

Age (yrs)/Sex	Male	Female	Total
0 – 10	0	0	0
11 – 20	24	0	24
21 – 30	45	3	48
31 – 40	73	5	78
41 – 50	56	4	60
Above 50	30	0	30
Total	228	12	240

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11.9% of those with fractures.

Fracture non-union occurred in 14.3% of patients with fractures. Mortality rate in this study was 5%. Eight out of the 12 patients that died had associated severe abdominal and chest injuries.

Table 2: shows duration of hospital stay of patients

Duration of hospital stay (weeks)	Frequency	Percentage (%)
<2	108	45.0
2 - 4	42	17.5
4 – 8	72	30.0
8 – 16	12	5.0
>16	6	2.5
Total	240	100

Table 3: shows complications of G. S. I

Complication	Frequency	Percentage (%)
Wound infection	48	20
Fracture non-union	14	5.8
Chronic Osteomyelitis	10	4.2
Tetanus	0	0
Residual nerve injuries	6	2.5
Residual vascular injuries	4	1.7
Amputation	2	0.8
Death	12	5

Discussion

The most commonly affected age group was 31 – 40 years. This was followed by the 41 – 50 year and the 21 – 30 year groups. As shown by Fiedler², the 21-40 year group accounted for a majority (52.5%) of cases of gunshot injuries. However unlike in the Fiedler study where all age groups were affected, in this study, there was no recorded gunshot injury in the 0–10 year age group. This study finding may be explained by the traditional emotional attachment of Nigerians to children. Children also are not usually outside their homes at night when most of these shootings occur.

Definitive surgical treatment was done for 57% of the fractures in this study. Open reduction and internal fixations were done secondarily and 12 patients had external fixation as a delayed primary procedure. The secondary operative treatment preferred in this study contrasts with the choice of early operative treatment in the study by Brien et al¹². This can be explained by differences in the availability of modern facilities between centres of such studies and our centre. Any attempt at early operative fixation of gunshot fractures in our centre may lead to catastrophic infective complications due to inability of our patients to afford appropriate antibiotics. Also in our centre patients must pay for implants, surgery and other requirements for operation at the point of service before such operations are carried out. All these contributed to the delay as surgeons can only operate 'as soon as possible'. This is in contrast to what obtains in developed countries where health insurance facilities cover trauma procedures as emergencies. Over there surgeons can operate on patients 'as soon as appropriate'. The high rate of operative treatment in this study contrasts with preference for non-operative methods as reported by Katchy⁷.

Twenty percent of the patients had wound infection. This is higher than 1.5 – 8% recorded in other studies^{10,11}. These studies were however undertaken in developed countries where technology is more advanced and health insurance provides for treatment of patients with more modern methods and medications. These are unlike in Nigeria where patients can neither afford expensive antibiotics nor repeated debridements in theatre. However our figure is lower than 25% reported by Yinusa and Ogirima⁵. Fracture non-union and chronic osteomyelitis also occurred in 16.7% and 11.9% respectively of those who had fractures.

Gunshot injuries are usually associated with long hospital stay. In this study 7.5% of the patients were in hospital for over two months, 30% stayed for between 4 – 8 weeks, 17.5% stayed for between 2 - 4 weeks, while 45% stayed for less than two weeks. The mean hospital stay of 26 days with a range of 2 days to 138 days compares favourably with those of other studies^{1,7}. The patients that stayed for over 16 weeks had a multi-staged bone and soft tissue reconstruction. Introduction of modern surgical practices along with recent surgical techniques can greatly reduce the need for long hospitalization. This had been shown by Brien et al¹⁴ in the management of unstable metaphyseal gunshot fractures of the tibia where he used hybrid external fixators, and achieved average stay of 2 weeks.

The mortality rate of 5% in this study is similar to that reported in other studies^{1,7,15}. The twelve deaths recorded in this study were from associated severe abdominal injuries.

CONCLUSION

The commonest complication of gunshot injury remains wound infection which contributes in no small way to the prolonged hospital stay of these patients. Fracture non-union, chronic osteomyelitis, amputation and deaths were also important findings

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