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Presentation of trauma at the National Orthopaedic Hospital Enugu: a pilot study

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SUMMARY This prospective study spanning three months was undertaken to provide insight to trauma care including intervention times in this centre. Improved organization of trauma care is needed urgently for improved outcomes.

Introduction

Trauma is a leading cause of death in developing countries, and pre-hospital care is rare.^{1,2} Even though a lot of work has been done in our environment few prospective studies include intervention times. The National Orthopaedic Hospital, Enugu, is a major trauma centre and an apex hospital for orthopaedics, burns and plastic surgery. It is situated at a confluence of three interstate highways. Between 65% and 75% of admissions are emergencies. The ambulance system in the country is poor, and organized professional home health care is rare. Patients come from a wide catchments area: the entire south east, the south, the Kogi and Benue states of Nigeria and the southern Cameroon.

This pilot study was undertaken in order to provide an insight into the spectrum of trauma and trauma care, including intervention time and propose recommendations.

Patients and methods

A three-month consecutive prospective report is presented. Self administered questionnaires supplied to the first on call doctor to complete as part the routine documentation were collected and analysed using SPSS version 11. Every patient admitted to the unit qualified for the study. Data on the history, physical findings and management of the team on call was entered. Data obtained from consecutive patients between April and June 2006 included name, age, sex, cause

of injury, body regions involved, injury-arrival time, haemodynamic status at presentation, intervention time and reasons for intervention. Haemodynamic instability was regarded as presenting with a diastolic blood pressure of less than 70 mmHg, and/or a rapid low volume pulse above 100 beats per minute (in adults). Intervention was regarded as 'delayed' if it was not given to the stable patient within an hour of presentation.

Results

One hundred and four questionnaires were completed. There were 82 males and 22 females (m:f = 3.9:1). Fifty-eight (55.77%) had received road traffic injuries (RTI); motorcycle accidents accounted for 13 (22.41%) of these. There were: 12 (11.54%) gunshot injuries (GSI), all male; eight (7.69%) burn injuries; 26(25.00%) other causes. Younger patients were more likely to suffer injuries from motorcycle accidents than from other RTIs: 76% of those between 15 and 30 years compared with 52.17% for the same age bracket in other RTIs.

Eighty-five (82.52%) came in stable haemodynamic conditional 18 (17.48%) were in shock on admission. Of those who arrived within an hour, 6.67% were in shock compared with 22.04% of those arriving between an hour and eight hours and 30.77% of those arriving between eight and 24 hours. A third of patients with GSI and 17.54% with RTI arrived suffering from shock.

Fifteen arrived within an hour of injury, 60 between an hour and eight hours, and eleven more than 48 hours after receiving the injury. This preponderance for arriving between an hour and eight was irrespective of modality of injury (Figure 1). Forty-two had a surgical intervention within two to six hours of presentation, five within an hour, and one patient died before surgical intervention could be instituted. All types of injuries except GSI had intervention mostly between two and six hours of presentation.

Intervention type

Wound debridement was the most common intervention. It was always done for gunshot injuries. External fixators were also preferred for open fracture stabilization following GSI.

Injury by body region (Table 1)

Injury to the lower limbs was seen more followed by injuries to the head/neck region. The abdomen was involved in two cases.

Places visited prior to before presentation

Sixty-one patients (59.22%) came directly to the hospital (12.90% of whom were in shock); 37 (35.92%) visited one

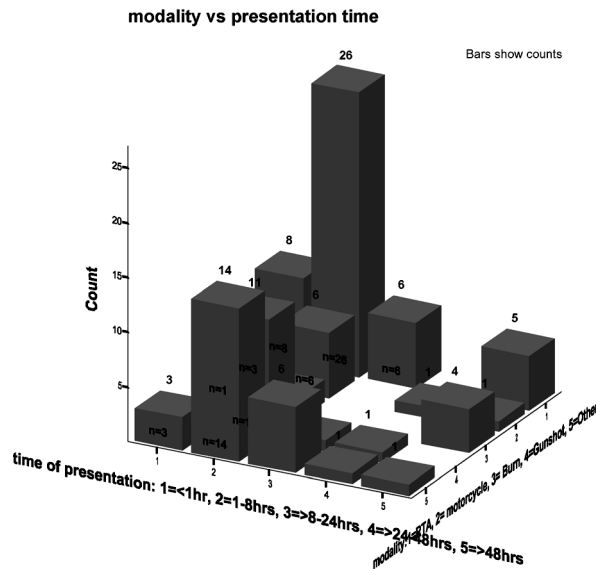


Figure 1 Interactive bar chart of injury arrival time and intervention time

place before transfer (30.56% of arrived suffering from shock); five visited two places before presentation; one visited three places before presenting.

The chief causes of delay in intervention in haemodynamically stable patients included awaiting a review by the senior resident, the unavailability of X-rays, and major incidents. However, in eight cases no reason was established.

Discussion

As in previous studies, there were a higher proportion of younger people among our trauma patients^{1,2} and road traffic injuries were the leading cause of admission.¹⁻³ The parts of the body injured are also similar to those seen in other studies.^{2,4}

There were fewer motorcycle injuries than seen in Harcourt and Calabar but more than seen in Ilorin.^{1,3-6} This variation is probably due to local transportation preferences. The choice of transportation is affected by the level of urbanization and socioeconomic factors.^{2,5,7,5}

In cities, where motorcycles are the preferred mode of commercial transport, the percentage of injuries would be expected to be higher. Young people were more likely to be involved in motorcycle injuries than: 76% of those aged between 15 and 30 years compared with 52.17% for the same age bracket involved in other RTIs.^{4,6,8} In our study motorcycle accidents were more likely to cause spinal injuries; other motor vehicle injuries were the more likely to be to the head and neck. Legislation and enforcement of the wearing of seat belts by all occupants of vehicles would drastically reduce the severity of injuries.

GSIs accounted for 11% which is probably a result of the rise in civilian violence and exceeds the number seen in other parts of the country. There were fewer such injuries during the period from April to June.^{1-3,7,9} This group was the most likely to present in shock, and the only fatality in the study was as a result of GSI. The intervention time for this group was the worst, and may be attributed in part to the Nigerian police instructions to report all cases of GSI before treatment is sort which has on occasion resulted in the delay to intervention. Stricter enforcement of legislature on firearms is needed and more vigorous attention needs be paid to such patients.

Injuries from burns are almost twice as common as spinal cord injuries. It may be because bed spaces for patients with spinal injured is limited, but burn injuries do occur more frequently in the dry season.⁸⁻¹⁰

Even though about 60% of the patients came directly to the hospital, only 14.56% arrived within an hour after the accident. This is attributable to the poor pre-hospital system in Nigeria as reported in similar studies from this and other centres in Nigeria.^{1,3} Injury arrival time in Nigeria is still measured in hours rather than minutes. Arrival time and prior presentation to other health facilities have a linear relationship with morbidity. Again, this agrees with other studies, locally and internationally, where injury presentation time is now measured in minutes.^{3,5,10,13-15} Adequate pre-hospital services and the upgrading of existing health facilities (both private and public) to enable them cater for trauma should help improve this situation.

About a third of the patients that came in within an hour had surgical intervention within an hour; this translates to less than 5% of all patients having intervention within an hour of injury. Indeed, less than 10% of all injuries had intervention within an hour of presentation. This is a sad commentary on the Nigerian emergency system and must be

Table 1 Injury pattern seen at the hospital

Type of injury	Head/neck	Spine	Trunk	Upper limb (R)	Upper limb (L)	Lower limb (R)	Lower limb (L)	Perineum	Multiple
RTI	7		3	1		7	5	1	19
Motorcycle	1	2			3	6	6		3
Burn	2		3	3	1	3	1		2
Gunshot	1			3	2	7	2	1	4
Machete	1			1	2				1
Falls	1	1	1	1	2	1	4	1	4
Assault	3	1	1	1	3	1	1		3
Domestic	1			1		1			
Crush					1				
Infective		1							
TOTAL	17	5	8	11	14	26	19	3	36

RTI, road traffic injury; R, right; L, left

improved. The time to intervention has not changed significantly in four years at this centre.³ Most interventions were undertaken within two to six hours of presentation. This time allows for primary repair of clean wounds, as bacterial colonization is unlikely to have set in and reduces the chances of wound infection. Less than 5% of all patients received treatment within an hour of injury and less than 10% within an hour of presentation. The earlier the intervention is received the better the outcome is for the patient.¹³

The length that elapsed before the senior resident's review had a greater impact the intervention than any other factor,³ followed by the unavailability of X-rays and the number of patients. These findings are not likely to be biased since the respondents filling the questionnaire were different doctors from those who collected the data in a previous study, and were not privy to the results. The hospital has had only one functional static X-ray machine for more than 10 years. This is a disturbing fact considering the goal of the Nigerian health ministry of the provision of specialist attention within 15 of arrival.

Sadly trauma is not listed among the Millennium Development Goals. It is all the more disturbing since motor vehicle accidents are projected to be ranked the third highest cause of the disease burden worldwide by the year 2020 with the number injured yearly estimated at 50 million.¹⁶ The senior residents are not quartered in the hospital. If this were changed the intervention time should greatly improve. Massive fund injection by government and non-governmental agencies is needed in order to effect the changes in infrastructural and technology needed to make a difference.

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