Trauma Registry Development for Jos University Teaching Hospital: Report of the First Year Experience

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Abstract Adequate intervention in trauma management and prevention requires a well-documented database for objective study of the disease characteristics, hence the need for a trauma registry. The aim and objective of this study is to document in a database all patients admitted in our hospital following trauma. This study was conducted at the Jos University Teaching Hospital, Jos, Plateau State, Nigeria. Beginning 1 January 2012, data was collected on a trauma data sheet and transferred to a 3-page, 80-point questionnaire on Epi info3.5.2 software and stored in a standalone desktop computer. Four hundred fifty-nine patients were registered. Road traffic collisions were the most common causes of trauma, 312 (70.0 %), followed by gunshots, 58 (12.6 %). Mechanism of injury was blunt in 307 patients (66.9 %) and penetrating in 152 patients (33.1 %). Only 9 patients (2.0 %) were brought in by ambulance; majority came by public transportation, 401 (87.4 %). Eighty four patients (18.3 %) suffered various complications; 342 (74.5 %) were discharged home in satisfactory condition, and there were 32 hospital mortalities (7.0 %). Challenges encountered include difficulty in data collection, lack of computer software and internet access, no dedicated

registry staff and no funding to engage, train and retain data gathering and management personnel. Our results provide data in support of the known epidemiology of trauma in our environment. Challenges encountered can be overcome using local assets and resources.

Keywords Injury · Trauma · Registry · Trauma record keeping

Introduction

Trauma is a leading cause of death and disability worldwide [1, 2]. There is an increasing yearly trend to trauma which is accounted for by increased road traffic accidents in developing countries which, though having a lower volume of vehicular traffic, have demonstrably higher accident rates [3]. There are indications that whereas mortality from road traffic accidents will decrease by 30 % in high-income countries, it will increase by 83 % in middle- to low-income countries [4]. Mortality is a poor indicator of the burden of trauma since most trauma do not lead to death. The consequences of the non-fatal outcome of trauma is enormous, and projections for the year 2020 show that external causes of injury will rise in the rankings of leading causes of disability adjusted life years (DALYS) [1]. Trauma is increasingly recognized as a public health problem, amenable to preventable strategies, and the first step in planning for such prevention is establishment of the magnitude and characteristics of the problem [1, 5]. This is achieved through a data collection surveillance system, hence a trauma registry. Our hospital has always grappled with the problem of high rates of trauma from vehicular collisions over the years, and this became compounded by mass casualty situations from recurrent civil disturbances and crises at the turn of the millennium. We set up a trauma registry in our

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hospital in 2012 and present here our experience the first year, highlighting challenges.

Methodology

Our trauma registry was set up in 2012. Preparations for its establishment included the acquisition of a desktop computer a year previously and establishment of a trauma unit and trauma team 2 years before. It consisted of a standalone desktop computer with 500-MB ram 1.73 Hz with a 4-GB ram processor, Hp 15 in. VGA monitor, ups, keyboard and mouse. Software was a 3-page, 80-point questionnaire designed on Epi info 3.2.1. Data collection commenced on 1 January 2012 and is ongoing. Data collection is done by a dedicated data collector who is usually a casualty officer or a resident. A trauma data sheet is filled for each patient presenting to the A&E with trauma then transferred to the computer software. Subsequently, there was daily tracking in the wards until death, discharge or transfer.

Inclusion Criteria Patients of all ages presenting with trauma requiring admission.

Exclusion Criteria All patients either brought in dead or who died in the emergency room.

Information gathered included demographics, circumstances surrounding the trauma, any pre-existing conditions, aetiology, body region affected, ER vital signs, initial care, definitive care, complications, length of hospital stay and outcome.

Results

Data Analysis

A total of 459 patients were entered into the registry between 1 January and 31 December 2012. Data entry was incomplete in 49 patients (10.7 %) while complete in 410 patients (89.3 %). The ages ranged from 1 to 90 with a mean age of 29.22±15.28 years. Three hundred sixty-three (79.1 %) were males, while 96 (20.9 %) were females. Only 9 patients (2.0 %) were brought to the hospital by an ambulance, while majority 401 (87.4 %) were conveyed by private vehicles (Table 1). The most common causes of trauma were road traffic collisions in 312 patients (67.9 %), gunshots in 58 patients (12.6 %) and falls from heights in 40 patients (8.7 %). Table 2 shows the causes of trauma among the patients. Mechanism of injury was blunt in 307 patients (66.9 %) and penetrating in 152 patients (33.1 %). The body part most commonly affected was the head in 275 patients (59.9 %) followed by the extremities in 62 patients (13.5 %). Eighty-four patients (18.3 %)

Table 1 Means of transportation to hospital

Means	Number	Percent
Private vehicle	401	87.4
Police vehicle	18	3.9
Federal Road Safety Corps	17	3.7
Public transport	12	2.6
Ambulance	9	2.0
Others	2	0.4
Total	459	100

suffered various complications, while 32 patients died (7.0 %). Three hundred forty-two (74.5 %) were discharged home in satisfactory conditions, while 13 (2.8 %) discharged themselves against medical advice and 4 (0.9 %) were referred to other institutions mainly for reasons of proximity to family. The length of hospital stay ranged from 1 to 134 days with a mean of 17.7 days.

Challenges

Challenges encountered include difficulty in data collection, lack of computer software and internet access, no dedicated registry staff and no funding to engage, train and retain data gathering and management personnel. The challenges and our solutions to them are outlined in Table 3.

Discussion

The age and sex distribution of our results is in keeping with the general demographics of trauma which affects young males predominantly and is similar to other registries from a developing country [5, 6]. This young population is an indication of the burden of trauma when the loss in terms of productive years lost is taken into consideration. The lack of an organized trauma system with ambulance and paramedic services is reflected in the fact that most patients were brought into the hospital by

Table 2 Cause of injury

Cause	Number	Percent
Road traffic collision	312	68.0
Gunshot	58	12.6
Falls	34	7.4
Burns	22	4.8
Domestic injury	7	1.5
Stab	4	0.9
Others	22	4.8
Total	459	100

Table 3 Challenges and their solutions

Challenge	Solution
Lack of personnel employed and trained for registry	Use of casualty officers and residents on rotations in A&E. Those assigned to the registry were excused from direct patient care. Involved frequent training on data gathering because of frequent rotations
Computer and software	A desktop computer was provided by the hospital management. For software, we used the Epi info statistical tool to enter data
No funding	Remains a challenge. Use of information technology staff on part time basis at less cost. Use of personal funds
Difficulty in data gathering	Frequent supervision and occasional joint data gathering
Quality assurance	Periodic crosschecking of data entry against patient's medical records

private transportation. An EMS is an integral part of an organized trauma system, and the correction of deficiencies in pre-hospital care is said to be one mechanism to improve the outcome of critically injured patients [7]. The near total absence of pre-hospital care in our findings underscores the need for the establishment of an organized trauma system with EMS, ambulance services and trained paramedics in our setting.

Road traffic collisions remain the greatest contributor to the aetiology of trauma in our environment as in other places [2–5]. The high prevalence of gunshot injuries reflects the proliferation of small arms and light weapons in the wake of the recent sectarian we have been experiencing. Overall, the predominant mechanism of injury in our setting is still blunt, reflecting the predominance of the road traffic collision contribution. It is instructive that despite the rising incidences of communal unrests and civil violence in our environment, the road traffic accident remains the greatest contributor to the burden of trauma. The implication of this is that opportunities for reduction of trauma burden, in our setting as in elsewhere, lies with strategies aimed at preventing road traffic collisions [1].

Although some patients had injury to multiple body parts, head injury was present in 68 % of our patients admitted with trauma. Head injury is common in polytrauma and when severe, accounts for most of the short- and long-term outcome as well of as mortality of trauma [2, 8–10].

Majority of the patients were discharged home in satisfactory condition, suggesting adequate hospital care for the patients, while a few (3 %) discharged themselves against medical advice. These are mainly patients with extremity fractures who opt for traditional bone setting once their more life-threatening injuries have been treated, a phenomenon pervasive in our environment and extensively reported from our centre [11, 12].

The hospital mortality of 7 % is closer to the 9 % from the Major Trauma Outcome Studies (MTOS) [2], but higher than the 1.8 % from the UAE, during the early stages of the establishment of their trauma registry [5], while the morbidity of 18 % suggest areas of need for improvement of care of injured patients. It is our hope that our trauma registry will in due course be advanced enough to provide information that will enable us examine aspects of treatment and outcome with a view to improving quality of trauma care in our hospital as has been observed in advanced trauma systems.

We encountered a number of challenges in the course of establishing our trauma registry. First was the lack of personnel employed and trained for that purpose. We therefore had to make do with casualty officers and resident doctors on rotations in the accident and emergency unit. For this reason, we had to frequently train new residents on the process of data gathering and crosscheck the data gathered for validation and quality assurance, a very important part of registry keeping.

The filling of a 3-page data sheet can be tedious, especially for individuals involved in direct patient care. We avoided this by ensuring that those posted to the trauma registry were excused from patient care for that period. This is only possible because of our large pool of casualty officers and residents on rotation. This might not be possible in places that do not enjoy this luxury. Some researchers have suggested limiting the scope of data collected to manageable limits to avoid the tedium of data collection [13]. We observe that limiting the amount of information collected may also limit the utility of the data so generated. Although our 3-page questionnaire is much, only the first page needs be filled during the phase of acute care and this usually takes about 10 minutes. The other information are generated and collated in the course of hospitalization, so those parts of the form are filled without much pressure.

Parts of the data collection were done retrospectively because the data collectors we appointed did not run 24-h shifts and did not cover weekends. This invariably gave rise to missing data and incomplete data sets. We are also handicapped by lack of computer software to enable the calculations of injury severity and predict probability of survival. It is against these variables that outcome of trauma care can be objectively calculated both within the institution and for comparison with other institutions. Funding has been a major challenge because most of the challenges require funding to overcome, and this is not forthcoming.

While the data collected so far has provided an objective basis for an epidemiological trend that was already obvious in our hospital, it has not yielded enough information to motivate management or government to employ especially dedicated trauma registry staff or to provide training for those on ground in registry keeping. The system of trauma funding (out of pocket payment) does not encourage hospital to invest money and resources in trauma registry because in the absence of reimbursement, it is seen merely as additional drain on lean

resources. Paradoxically, trauma registries can provide the basis for reimbursement and resource allocation for trauma care [14].

Our challenges in establishing up a trauma registry are not unique. The more sophisticated trauma registries can be expensive endeavours, utilizing specialized equipment and personnel. Despite this, many still suffer from incompleteness of data, and all registries have serious limitation in terms of interpretation and application of the information so generated [5, 6, 13, 14]. We have chosen a less sophisticated form, using limited resources at our disposal to gather as much information as we can on our trauma patients. There is a general dearth of trauma data from the developing world [2], and it our aspiration to help fill this void in our little way. We also hope to be able to sustain our registry, increase the parameters captured and get enough commitment and support to engage dedicated registry staff, train them and equip the registry with the necessary infrastructure, software and internet connectivity necessary for good trauma registry keeping, sufficiently powered to yield data that will drive changes in trauma prevention and care in our environment.

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Conflict of Interest The authors declare no conflicts of interest.

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