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Hospital-based injury data in Malawi: strategies for data collection and feasibility of trauma scoring tools

Jonathan C Samuel, MD MPH[*,†], **Adesola Akinkuotu**[§], **Paul Baloyi**[*], **Andres Villaveces, MD PhD**[‡], **Anthony Charles, MD MPH**[†], **Clara N Lee, MD MPP**[†], **William Miller, MD PhD**[‡], **Irving F Hoffman, PA MPH**[§], and **Arturo P Muyco, MD**[*]

[*]Department of Surgery, Kamuzu Central Hospital, Lilongwe, Malawi

[†]Department of Surgery, University of North Carolina, Chapel Hill, North Carolina

[‡]Department of Epidemiology, University of North Carolina, Chapel Hill, North Carolina

[§]University of North Carolina School of Medicine, Chapel Hill, North Carolina, USA

SUMMARY

Injury is a major cause of morbidity and mortality in developing countries. Utilizing a partnership between Kamuzu Central Hospital (KCH) and the University of North Carolina Departments of Surgery, we describe an approach to injury surveillance, examine the utility of trauma scoring systems, and outline steps necessary before such scoring systems can be reliably instituted in a resource-constrained setting.

Introduction

Trauma registries are an integral part of injury surveillance.[1] Yearly in Africa, the burden of injuries is estimated at over 15 million lost disability-adjusted life years.[2] Despite this, few African countries collect hospital-based injury data.

In the USA, trauma registries began decades ago and culminated in the Major Trauma Outcomes Study.[3] This led to scoring systems such as the Revised Trauma Score (RTS), Injury Severity Score (ISS) and the Trauma Score Injury Severity Score (TRISS).[4–6] These scores quantify the likelihood of mortality; the ISS utilizes ICD-9 coding, RTS utilizes respiratory rate, systolic blood pressure and Glasgow Coma Score (GCS), and the TRISS combines the ISS, RTS and patient age.

Developing countries still lack consensus regarding analysis of trauma registry data. Some advocate for traditional scoring systems (ISS, RTS and TRISS).[7] Others are advocates for novel scoring systems such as the Kampala Trauma Score (KTS) which utilizes age, number of serious injuries, systolic blood pressure, respiratory rate and neurologic status to quantify injury severity (KTS).[8,9]

We sought to determine the utility of two methods of data collection: (1) a casualty department trauma registry; and (2) a comprehensive retrospective review. We then investigated the applicability of four trauma scoring systems (ISS, TRISS, RTS and KTS) using the two data collection methods.

Correspondence to: J C Samuel, Department of Surgery, Kamuzu Central Hospital, Lilongwe, Malawi jsamuel@unch.unc.edu.

Methods

The study was conducted in October 2008 at the Kamuzu Central Hospital (KCH), an 800-bed hospital serving a population of five million. The casualty department at KCH consists of three beds and has basic supplies (bandages, sutures, peripheral intravenous access, blood drawing) and equipment (sphygmomanometer, pulse-oximeter). Clinical officers from the KCH Department of Surgery staff the casualty department 24 hours a day and consultant surgeons supervise the clinical officers. This study utilized two data sources: a casualty department trauma registry which was initiated in July 2007, and a retrospective review of all hospital ward admissions, discharges and report log books. The casualty department trauma registry consists of a one-page, double-sided data collection form containing an expanded `minimal data set' for trauma patients.[10] Information from the casualty department trauma registry and the retrospective review were combined. From this we attempted to locate medical records in order to collect vital signs, GCS and calculate ICD-9 codes. TRISS, RTS, KTS and ISS scores were then calculated according to previously published methods.[4–6,9]

Results

A total of 127 patients were admitted to KCH for treatment of injuries: 45 (35.4%) were identified only by retrospective review of hospital records; 27 (21.3%) only by the casualty department trauma registry; and 55 (43.3%) by both methods.

We attempted to locate the medical records for the subset of 63 inpatients identified during the first half of the study and found charts for only 23 (36.5%). From these, we calculated an ISS. However, only 11 had enough information (age, vital signs, neurologic status and ICD-9 information) to allow for the calculation of the RTS, KTS and TRISS. From these 23 charts, we were unable to collect any pre-hospital information except a broad description of injury mechanism. Mode of transport, time sequence, occupation and injury location were only available from the casualty department trauma registry.

Conclusion

Data collected by either a casualty department trauma registry or from a retrospective review is inadequate in settings such as KCH. Relying on only one source will mean that data for many patients will be missed; less than half were found in both data sources. Additionally, the information gained from both sources is complementary; a casualty department trauma registry collects data on outpatients and detailed pre-hospital information, such as injury setting, means of transport and injury time sequences, while a retrospective chart review captures information on treatment and outcome. Theoretically, a retrospective chart review would allow for the calculation of trauma scores and a correlative analysis between outcomes and patient factors (for example, to calculate trauma norms or coefficients in order to predict mortality in a developing country). Practically, though, this is hampered by the incomplete information entered in the medical records (only 11 of 63 charts had enough data in order to calculate an RTS or TRISS) and medical records missing altogether (overall, only 23 of 63 charts were able to be located). Despite these limitations, combining data from a casualty department trauma registry and a retrospective review results in both fewer missed patients and a more complete data set.

Discussion

Resource constraints in developing countries greatly restrict the quality of trauma data which, therefore, hinders the application of traditional scoring systems. Staff shortages are

severe; with an average of only two nurses per 50 ward patients, it is no surprise that vital signs are not recorded. The approach taken at KCH to address the impact of resource constraints has, thus far, focused on improving training. The KCH Department of Surgery has trained providers to understand the importance of, and to possess the skills to accurately take vital signs and document clinical findings.

The University of North Carolina and Kamuzu Central Hospital have a long-standing partnership which began two decades ago with programmes designed to address the problems with infectious diseases. This partner institution model has worked well and provided a unique opportunity for the University of the North Carolina Department of Surgery to partner with KCH in order to address injury prevention. This is being accomplished through a constant presence of University of North Carolina surgeons who provide not only clinical care but also provide formal and informal didactics to the students, clinical officers and surgical residents and support research projects aimed at improving patient care and outcomes. We strongly advocate for the institute of sister institutions in other hospitals. This partnership is providing a foundation for continued improvements in record keeping and documentation, as well as overall patient care.

Although it is possible to perform complex analyses utilizing scoring systems designed and validated in developed countries, we found that it was advisable to first examine the completeness of data sources and address any resource constraints. Such improvements in staffing, knowledge and skills will simultaneously raise the quality of medical care and improve data quality.

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