VIEW POINT

Developing a low budget trauma registry

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Abstract

Trauma registry plays an essential role in collecting epidemiological injury data which is used in quality care improvement and research. This paper was planned to share our experience of having developed a low-budget user-friendly trauma registry with the help of Microsoft Access. This was used because of its ease of use, quick development style, and support for relational database design. Variable included in our registry were demographics, description of injury, International Classification of Disease 9 Clinical Modification (ICD9-CM) external injury classification codes, date and time of arrival, length of hospital stay, referral to and from hospital, physiological assessment along with scores for assessing the injury severity. Developing a local trauma registry helped us in scrutinising our practice, and we believe that a national or regional trauma registry is the need of the hour in Pakistan. This will highlight the concerns specific to our society in providing quality trauma care.

Keywords: Low budget, Trauma registry, Low and Middle Income Countries, LMICs, Trauma databank.

Introduction

Traumatic injuries are the fourth leading cause death in the United States currently, but it is expected to go to the third position due to increase in population and number of vehicles.[1] However, in Low and Middle Income Countries (LMICs) the situation is bit critical and the reason is increase in the number of road traffic accidents (RTAs) due to violation of traffic rules and lack of structured pre- hospital care. In Pakistan, trauma-related disabilities have changed from being the 5th leading cause in 1990[2] to the 2nd leading cause in 2013[3] and traumatic injuries are the 11th leading cause of unnatural deaths in Pakistan.[3] Trauma-related morbidities and mortalities can be reduced by analysing the practice of managing trauma and the patterns with which they present. The first step towards this is the surveillance of traumatic injuries through a registry.

Trauma registries play an essential role in collecting and analysing pertinent epidemiological data which is then used in quality care improvement and research. Establishing of trauma registries will further support in increasing investment in the field of trauma by identifying the areas where work needs to be done and in devising injury prevention programme.[4] Currently, trauma registries of the High Income Countries (HICs) include the National Trauma Data Bank (NTDB) which is the biggest collection of United States trauma registries from all over the country, the Trauma Audit and Research Network (TARN) of the United Kingdom and the Victorian State Trauma Registry (VSTR) in Australia.[5] However, there is scattered data of established trauma registries in LMICs and often they are reported from a single centre. Issues in establishing and maintaining a well-structured trauma registry include first and foremost lack of funding. As per an Australian study, the maintenance cost of trauma registry is $100 per case[5], Besidxes, lack of health-related information technology personnel and lack of interest in doctors towards this area are aslo among the relevant issues.[6] Therefore, we decided to produce our own domestic trauma registry with minimal resources available. The current paper was planned to present the methods and techniques adopted in order to build a user-friendly, professional trauma registry. Approval from institutional ethics review committee was not sought as the registry comprised retrospective entry of patients' data.

Methods

The task of building a trauma registry was taken voluntarily by fresh medical graduates while doing research in the department of General Surgery, Aga Khan University Hospital. The software used was Microsoft Access for Windows because of its ease of use, quick development style and support for database design. Centre for Disease Control (CDC) trauma registry was used as a guideline for our new registry and changes were made according to our needs. Few variables were

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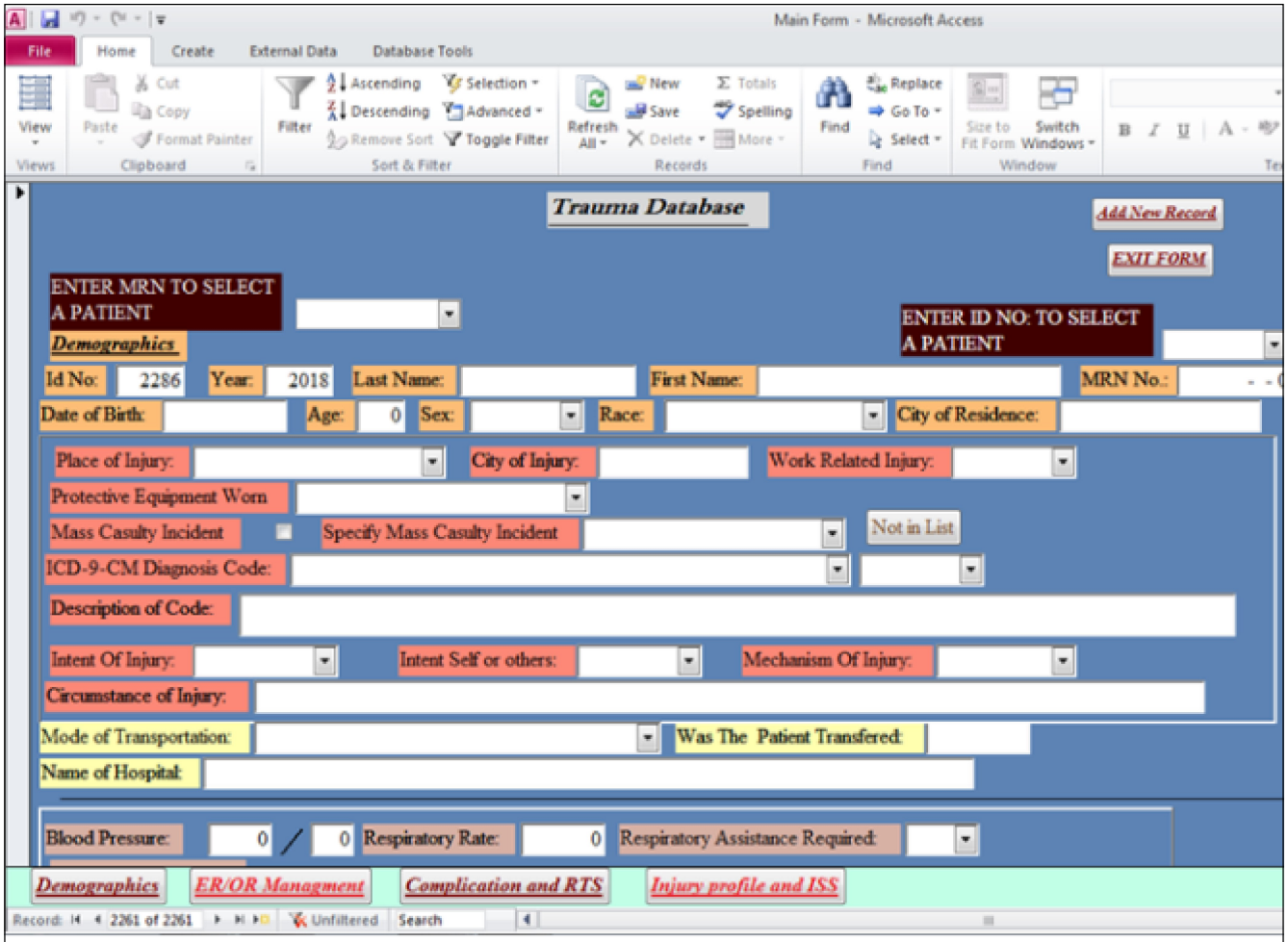

Figure-1: Main form of registry.

replaced with data items more relevant to Pakistan, such as details of patients transferred and their mode of transportation and in-hospital complications more pertaining to our settings.

Drop-down menus and check boxes were used and the flow of data entry was organised from top to bottom to reflect the chronological flow of admission history, physiological assessment, physical examination, subsequent care provided and the final outcome. This was done to facilitate accurate and rapid data collection. Regular discussions with the trauma team and piloting it over on few patients assisted in the final version of the registry.

Variables included in the registry were demographics, description of injury, International Classification of Disease 9th Clinical Modification (ICD9-CM) external injury classification codes, date and time of arrival, length of hospital stay, referral to and from hospital, physiological assessment, surgical procedures, ICD9-CM diagnosis codes (E800-E959) in drop-down menus and final outcome (deaths versus discharge from hospital). A measure of injury severity also included, such as the Glasgow Coma Score (GCS), Revised Trauma Score (RTS), and the Injury Severity Score (ISS) (Figures 1-2).

The trauma registries are the databases that help in evaluating the nature and pattern of trauma that is presenting to a hospital. Trauma registries in HICs have been an incredible tool to gain the volume and types of injuries and at the same time formulate strategies to avoid them. Currently, the NTDB from US contains comprehensive data on over 7.5 million electronic records from more than 900 trauma centres.[7] LMICs face a number of obstacles to the development of trauma registries, and

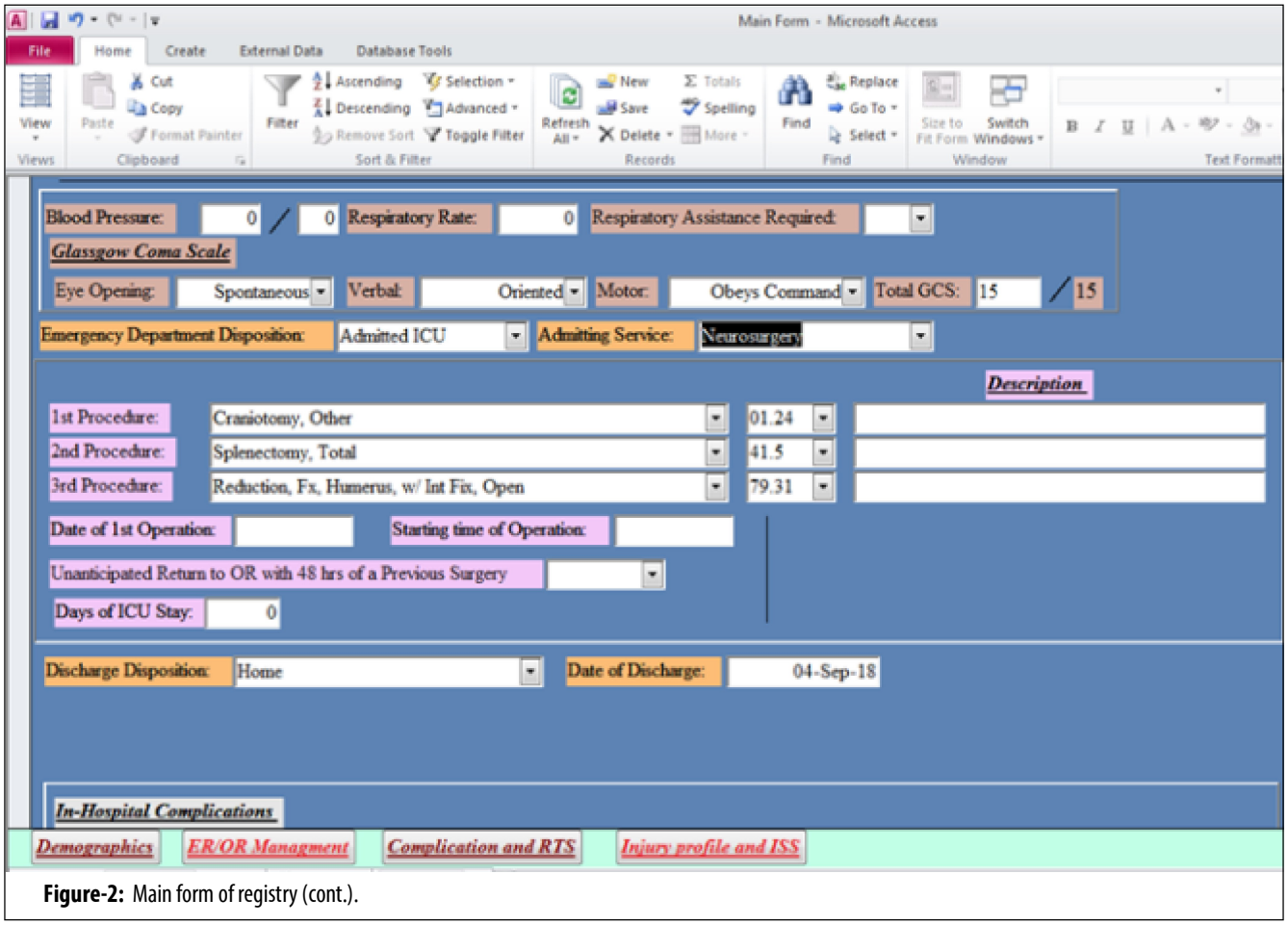

Figure-2: Main form of registry (cont.).

a few of them have been successful in developing local registries. According to the literature review from majority of LMICs, only one to two studies are reported showing their results of trauma registry analysis compared to the reports from HICs which include from US (288), UK (13), Germany (32) and Australia (45).[4]

The importance of trauma registries is explained by the fact that the patients with potentially treatable life-threatening injuries die six times more in LMICs compared to HICs where there is structured trauma system.[8] The idea behind our discussion is to encourage our fellow medical colleagues in both the public and the private sectors to establish a trauma registry with minimal resources. In this information age where almost everyone has some basic knowledge of the computers or almost every institution has some information technology (IT) professional working who can help in making a registry on software similar to ours.

The prime advantage of this kind of registry is its cost effectiveness. As described in literature, a substantial amount is required in a registry making and its maintenance. Like in Japan, for registering in the Japan trauma databank the amount is around ¥100,000. According to TARN, the annual fee of maintenance is £8,700[9]. Even a study reported from our region required $9,600 for the trauma registry development by a software developer.[10] But almost every national trauma registry in the developed nation is government-funded or grant-based.

We stress on the importance of having such low-cost trauma registries in all trauma centres in our region due to limited health budget in Pakistan. The data can be combined on an yearly basis in a combined meeting. Data from the Microsoft Access can be transferred to SPSS for analysis. Steps need to be taken by surgical residents or medical students who have sufficient computer skills to come forward in this regard. Since our registry was developed, we were able to maintain it on a daily basis

with the help of our residents in training who see trauma cases on a daily basis.

Conclusion

Trauma registries are valuable sources of evidence that could possibly be used in quality of care advancement, policy expansion, injury anticipation, and clinical and epidemiological research. Our stress is on development of trauma registries in all tertiary care hospitals in our country followed by interconnection of these registries nationally and internationally.

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