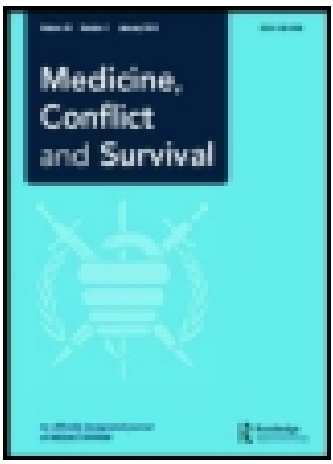

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Implementing a hospital based injury surveillance system: a case study in Nigeria

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A pilot study of violent injury surveillance was implemented in two hospitals in Kano, Nigeria, in two phases: a formative evaluation including training and arranging the collection of hospital information, followed by a 6 month prospective data collection. Road traffic injuries constituted about 80 per cent of the cases, gunshot injuries were the commonest in victims of interpersonal violence (IPV). The causes and context of IPV, the relationship of victims and perpetrators, and the place, related activities and anatomical site of injuries from IPV are summarized.

Keywords: hospital based injury surveillance; interpersonal violence; Nigeria; violence and injury prevention

Introduction

Implementing a pilot violent injury surveillance system at two hospitals in Kano, Nigeria, as case studies, had benefits and challenges. Two phases were undertaken. The first phase was a formative evaluation that included training of trainers, and arranging collection of hospital information including demographics and samples of patient records. The second stage was a 6 month prospective data collection. Road traffic injuries (RTI) constituted about 80 per cent of the cases, whereas injuries from gunshots were the majority among victims of interpersonal violence (IPV). This was not necessarily reflective of all injuries in Kano as these hospitals represented only a subset of the entire population area and lack of 24-hour coverage resulted in missing data.

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Background

Documentation of violent injuries in a hospital emergency room can provide valuable information on the characteristics and occurrence of such injuries, which is useful for the immediate management of cases and also for future prevention. Our study, a part of a multinational injury surveillance system pilot project in five African countries, focussed on documentation of injuries collected from two hospitals in the northern Nigerian city of Kano[1].

The National Orthopaedic Hospital, Dala, Kano is a specialized trauma centre that handles trauma cases from three of the six geopolitical zones of Nigeria and neighbouring countries of Niger, Chad and parts of Northern Cameroon. The Aminu Kano Teaching Hospital (AKTH) is also located in Kano, a city of 3.8 million according to the 2006 census. AKTH is a modern and well equipped hospital with over 600 staff in all essential departments that provides primary, secondary and tertiary health care services. Information on the activities of the respective hospitals is given in Table 1.

Data on interpersonal injuries, especially on homicides where firearms were the weapons, have been limited both in the records of the police and the hospitals. Also, it has been acknowledged that injuries and, perhaps, mortality from weapons during conflicts may not be well-documented[2,3]. Several factors have been advanced for the constraints on documentation of injuries during such situations, depending on the context in which these injuries occur[4]. Our objective was to determine the feasibility of implementing a surveillance system at these hospitals, with a focus on injuries sustained from interpersonal origin (IPV), with a special emphasis on firearm violence due to its often lethal nature.

Methods

We approached the injury survey in two phases. Phase I consisted of a formative evaluation of the participating hospitals, National Orthopaedic Hospital Dala, Kano, and Aminu Kano Teaching Hospital, Kano both in

Table 1. Hospital information.

	Aminu Kano teaching hospital	National orthopaedic hospital, Dala
Bed capacity	230	190
Out-patients (in 2003)	101,036	13,497
In-patients (in 2003)	8937	6896
Homicide (daily)	1	1–2
Suicide (daily)	–	–
Armed conflict (daily)	1	2–3
RTI (daily)	10–15	20–25

the north of Nigeria. This stage involved gathering information on case loads, bed capacity and yearly patient flow in the participating hospitals. Also, we were interested to know the daily case load under the following headings: homicide, suicide, armed conflict and RTI. One member of our research team participated at a 3-day 'train the trainers' session held at Jomo Kenyatta National Hospital in Nairobi, Kenya in March 2006, as a capacity building process aimed at understanding the surveillance system we intended to utilize. The participants tested entries into the software-EPI Info and compared a standard hospital form at the emergency department to the questionnaire we would be using in Phase II data collection designed by the Pan American Health Organization and the United States Centre for Disease Control and Prevention. Ethical clearance was applied for and received from all the hospital's ethical review committees. At the end of the workshop, participants were equipped with the knowledge for the task ahead as well as the tools to train colleagues at the hospital emergency rooms. We met with colleagues at our hospitals for orientation to the project and to review the basic information on each hospital (Table 1). Funds that were available were used to acquire and install the necessary laptops and software. Other supplies including questionnaires were printed and also made available in paper format, and were readied to be made available at the emergency departments of our participating hospitals.

Phase II began with prospective data collection on 1st January 2007. Data collected during this phase were entered into a database and cross-checked by one of the authors for quality control. Edited reports produced were circulated among the authors for corrections and submitted electronically to the co-ordinating centre at the Ponce School of Medicine in Puerto Rico, where analysis was done.

Results

This article will focus on injuries caused by IPV. Between January and June 2007, 337 new violent injury cases were recorded; 271 of these were RTI, 80 per cent of all cases documented. There were 57 injuries from IPV, representing 16.9 per cent of all injuries documented. Six (1.8 per cent) self inflicted injuries were reported; two cases had undetermined intent whereas one had a missing code. Implementation of this system as assessed by data entry monthly ranged from 7.5 to 30 per cent. Figure 1 shows the summary of the absolute number of cases recorded in every month.

Injuries sustained from interpersonal violence

There were many more male (89.5 per cent) than female cases (9.4 per cent) of IPV injuries. The victims of IPV belonged to several age groups: 8.8 per cent were between 0 and 19 years of age; 76.7 per cent were between 20 and

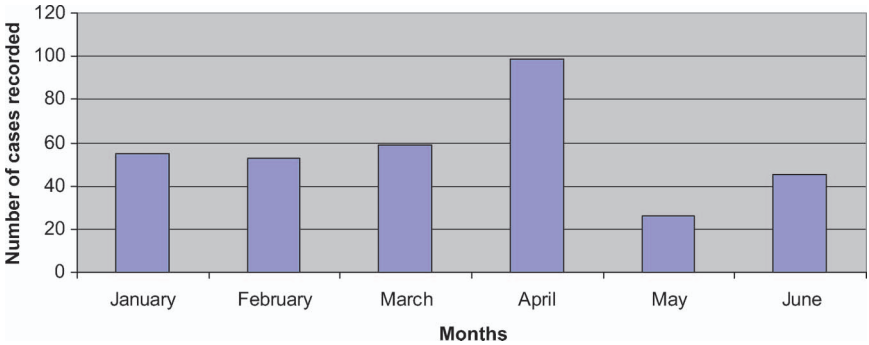

Figure 1. Implementation of injury surveillance per month.

39 years; 12.3 per cent belonged to the 40 to 59 years group; and those more than 60 years of age comprised 2.2 per cent of the cases.

Gunshot injuries comprised 42 per cent of the injuries documented in our study. Stab wounds and injuries from blunt force accounted for 25 per cent and 21 per cent, respectively. The perpetrators were predominately male. In context, 16 per cent of IPV injuries occurred during a quarrel or fight and 12 per cent during robbery. Other contexts accounted for eight per cent; for 61 per cent data was missing. Table 2 summarizes the gender of the perpetrator of the injury and their relationship to the victim. Thirty five per cent of injuries relating to IPV were recorded at home, whereas school provided the least common environment for IPV, 3.5 per cent (Table 3). Most of the injuries relating to IPV were during sports (43.9 per cent) and in 51 per cent, the head was the site most affected.

Discussion

Implementation of a new system in an establishment often poses challenges and opportunities. From the onset, when this idea was discussed, the participating hospitals welcomed the innovation and were motivated to follow through, but there were impediments. Several approaches have been adopted by researchers to evaluate surveillance systems[5,6]. Some authorities have advanced several criteria that could fulfil an effective evaluation of surveillance systems. These include the simplicity of the methods used, the flexibility of the system to new questions needed to provide detailed information on emerging injury patterns in the community, and the acceptability of the system to be implemented by the implementers themselves and the hospitals.

Phase I of this pilot study went fairly smoothly but the new design of the more detailed questionnaires received mixed reactions. Some colleagues at the emergency departments of the participating hospitals felt it was too long

Table 2. Relationship of victim to perpetrator and gender of perpetrator.

Relationship	Partner or Ex-	Parents	Unknown	Missing
	5.3	15.8%	17.5%	61.4%
Gender		Male	Female	Unknown
		64.9%	3.5%	31.6%

Table 3. Place, activities and anatomical site of injuries from interpersonal violence.

Place	%	Activity	%	Anatomical site	%
Home	35.10	Working	22.80	Head	50.90
School	3.50	Studying	5.30	Chest and abdomen	15.80
Street	36.80	Sports	43.90	Upper limbs	19.30
Work	15.80	Travelling	17.50	Lower limbs	10.50
Bar/restaurant	–	Recreation	10.50	Pelvis/genitals	3.50
Other	8.80	Others	–	Multiple	0.2

and cumbersome to be completed when their staffs were busy resuscitating and/or providing critical care to patients.

Evaluation of Phase II revealed some positive aspects of implementation of the surveillance system, including the increased knowledge of the medical staffs regarding research. Availability of extra information on injuries was seen as an improvement compared with previous medical records. Involvement of medical students and medical assistants in data collection raised awareness of the need for systematic collection of injury data. The pilot study also increased the capacity of both collection of data and entry into a complex software system for future analysis. Acceptance of the questionnaire and the process by the hospital authorities was also a positive aspect of this endeavour. There was a presumption at the outset that data entry would be conducted by qualified personnel who were computer literate, which was not always true. There was insufficient funding to maintain research staff and assistants for 24 hours and 7 days for the 6 months (although it should be noted that paying hospital staff to participate was never part of the approach). Availability of emergency department staff, who were always very busy, to take on additional work was limited. High patient turnout could slow down data entry at busy times. Lack of sufficient computers and poor internet connections to send reports electronically to the Principal Investigator hampered timely input and output; this relates to inadequate funding[7].

IPV leads to injuries that may lead to several forms of morbidity, and in some cases, fatalities. Though the outcomes of injuries were not the primary focus in our brief study, it is worth noting their impact on the health of individuals, society and the country, especially of gun related injuries, which

include not only immediate physical trauma but displacements of people, truncated social and health developments and breeding a culture of violence[8,9]. Injuries from blunt force were equally important. Robbery is closely related to the socio-economic conditions of a country that moved from an era of prolonged military rule to civil governance less than 10 years ago. Increasing levels of poverty, and decline in social services, impose stress on citizens which may be expressed in anger and quarrels at the slightest provocation. The implementation of a surveillance system requires a politically stable environment to be effectively sustained.

Conclusions

This brief study provided positive opportunities to increase the knowledge of IPV in the setting of a developing country that is overloaded with patients and often short of adequate staffing by health care providers. Improved investment in technology for documentation and training of personnel are essential in a modern health delivery system. Adequate data collection, especially for injuries, will be needed for proper planning and development of intervention strategies for injury and violence prevention. It will therefore be suggested that a sustainable system built into the daily routines of our hospital is warranted.

We acknowledge limitations in this study. This includes the small number of cases captured within the short time available for this study. The inability to mount a 24-hour daily coverage probably resulted in missing data. Also, our conclusion may not be generalized to the whole country because our participating hospitals may not necessarily represent the entire population of patients in Nigeria. A more elaborate study conducted in the six zones of the country is urgently needed.

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