Community survey of childhood injuries in North-Central Nigeria

LO Abdur-Rahman, JO Taiwo, CKP Ofoegbu, AO Adekanye, OO Ajide, CY Ijagbemi and BA Solagberu

Background and purpose **Childhood injury is of great significance globally and epidemiological data on the subject in most developing countries are inadequate. Informed demographics can help direct resources toward research and programs most likely to reduce the burden.**

Methods **A survey to determine the prevalence, mechanism of injury, and intervention measures was conducted using pretested questionnaires distributed to consented parents/guardians of children 15 years and younger who presented at six selected hospitals (representing public and private and low or high income clientele hospitals) for healthcare needs for any reason. Results were analyzed using Epi Info (6.04) and SPSS software (version 15).**

Results **There were 1088 respondents comprising parents (96.5%) and guardians (3.5%). Most were 21–40 years old (86.2%) and 51.9% of them had more than three children living with them. Over 50% had witnessed injuries of their wards within the previous 12 months and about a quarter admitted that a child was injured more than once. The risk of injury was twice in the male child mainly in the 1–4 years age group. Most injuries (65.2%) occurred at home, with 98% being unintentional from falls (62.6%) and 71.9% of the times the parents witnessed the injury as it occurred. The intentional injuries (2%) followed assaults during fights among peers. Treatment was provided at home in 58.5% of children by the parents, whereas only 27.5% took their wards to the hospital; 12.6% received treatment at patent medicine stores and 1.3% from the herbal/traditional bone setters' home. Two deaths resulted from the injuries from fall, whereas six children had residual deformity as a result of home injury. Three-quarter (74.8%) of the respondents believed childhood injuries were preventable.**

Conclusion **Childhood injuries are not uncommon in the community. The significant proportions of respondents using inappropriate means of treatment and who believed that injuries are not preventable represent targets for health education and counseling in the community.** ***Ann Pediatr Surg*** **11:136–139 © 2015 Annals of Pediatric Surgery.**

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Promotion (CIRASP), Department of Surgery, University of Ilorin Teaching Hospital, University of Ilorin, Ilorin, Nigeria

Correspondence to LO Abdur-Rahman, MD, Center for Injury Research and Safety Promotion (CIRASP), Department of Surgery, University of Ilorin Teaching Hospital, University of Ilorin, Ilorin, Nigeria
Tel: +234 803 391 6138; e-mail: bolarjide@yahoo.com

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Introduction

Every day, worldwide, the lives of more than 2000 families are torn apart by the loss of a child to unintentional injuries [1]. Child injuries are a growing health problem and although data of incidence are available for most parts of the developed world, there is a lack of evidence of the magnitude of the problem and thus inadequate political will to intervene in many parts of the developing world [1–6]. The world report on child injuries and prevention launched in 2008 aims to bring attention to the magnitude of the problem, its preventability, and make recommendations that can be implemented by all countries [1]. In Nigeria and some developing countries, injury is known to constitute a high magnitude of burden surpassed only by the burden of poverty and infectious diseases [7–10]. However, only a few child injuries are reported to the physicians in developing countries because most are taken care of at home by the parents or by consulting patent medicine shops and herbal/traditional bone setters for various reasons, which include tradition, ignorance, supposedly cheap and quicker services, and faith [11–13]. These factors may result in an inadequate representation of the actual incidence of childhood injury affecting its perceived magnitude, thus damping the political will to act. This study describes the burden of child injuries and its relationship with the socioeconomic and cultural factors in an urban community in North-Central Nigeria.

Methods

This community-wide study was carried out in six hospitals (both public and private) in metropolitan Ilorin, North-Central Nigeria; it examined the burden of child injuries and its relationship with socioeconomic and cultural factors prevalent in this part of the developing world. The six hospitals were selected on the basis of their even spread across the metropolis and their high patronage of low-income, middle-income, and high-income patients. An interviewer-administered questionnaire was used to obtain information from consenting parents or guardians of children presenting to the selected hospital. Data on household demographics, socioeconomic status, injuries to children in the preceding 12 months, and the treatments provided were collected. The questionnaire was pretested and validated by a pilot study carried out in one of the selected hospitals. Data were analyzed using Epi Info (6.04;

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Atlanta, Georgia, USA) and SPSS (version 15.0; Chicago, Illinois, USA) statistical software and level of significance was set at *P* value of 0.05.

Results

The 1088 (80.6%) questionnaires that were fully completed comprised 992 (91.2%) mothers, 58 (5.3%) fathers, and 38 (3.5%) guardians. Majority of the respondents were 21–40 years old [938 (86.2%)], and others were less than 20 years [54 (5%)], 41–60 years [89 (8.2%)], and more than 60 years [7 (0.6%)]. Five hundred and twenty-three (48.1%) respondents had 1–3 children living with them (median = 3), and 51.9% of respondents who had more than three children living with them recorded a higher proportion of injury (relative risk = 1.25, odds ratio = 1.62) (Table 1).

The marital statuses of respondents were as follows: 1058 (97.3%) married, 18 (1.6%) single parents, and 12 (1.1%) unmarried guardian. Education status of respondents showed that 60.3% had the basic level of education (primary, Arabic, and secondary), 10.2% had no formal education, and 29.5% had tertiary higher education. The chance of occurrence of injury in children of educated parents was lower (relative risk = 0.45, odds ratio = 0.17) (Table 2).

Nearly half [540 (49.6%)] of the respondents were petty traders of low socioeconomic class, 474 (43.6%) were middle-class civil servants, and 74 (6.8%) were professionals. Of the respondents, 602 (55.3%) recalled injuries of their wards within the past 12 months and about a quarter [148 (24.6%)] admitted that a child was injured more than once. Of those injured, 386 (64.1%) were male, whereas 216 (35.9%) were female (male : female = 1.8 : 1). The injury occurred mainly in the 1–4 years age group (39.0%), followed by the 5–9 years (34.2%), 10–15 years (17.9%), and less than 1 year in 8.6%. About 30% of respondents had more than one child living with them injured.

Most of the injuries (65.2%) occurred at home, whereas 26.2, 5.3, 1.0, and 2.3% occurred in the school, parents' office, guardian's office, and the road, respectively. Ninety-eight percent of the injuries were unintentional and 71.9% of the times, the parents witnessed the injury as it occurred. The intentional injuries were because of assaults during fights among peers. The frequency and types of injuries are shown in Fig. 1, where falls accounted for 62.6% and road traffic injury (RTI), although the least was all among pedestrians.

The lower limb was injured in 51.6% respondents, face in 19.2%, the upper limb in 15.3%, and the trunk in 10.3%. Multiple injuries occurred in 3.6% (Fig. 2).

Treatment was given at home to 352 (58.5%) children by the parents, whereas only 166 (27.5%) took their wards to the hospital. This was immediate in 4.3%, when no desirable response to initial treatment was observed in 4.3% and when complications developed in 18.9%. Seventy-six (12.6%) children received treatment at patent medicine stores and eight (1.3%) received treatment from the herbal/traditional bone setters shop.

Four deaths resulted from the injuries from fall, whereas 12 children were deformed from burns injury and poorly treated bone fractures.

Three-quarter of the respondents [814 (74.8%)] believed that childhood injuries are preventable by removing

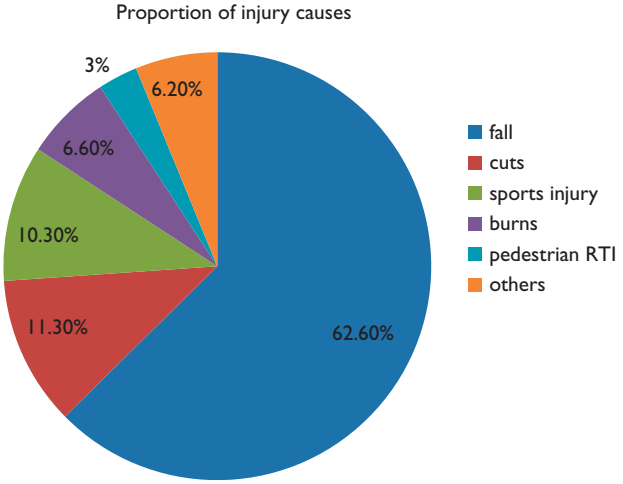
Table 1 **Number of children 15 years or less in the household**

Number of children	Respondents [*n* (%)]
1	61 (5.6)
2–3	462 (42.5)
>3	565 (51.9)
Total	1088 (100)

Table 2 **Education status of respondents**

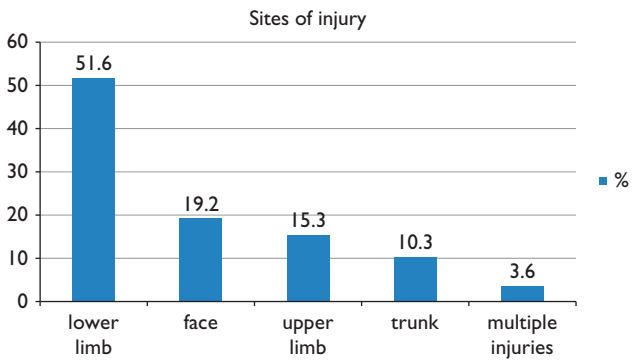
Education levels	Respondents [*n* (%)]
Primary/Arabic school	470 (43.2)
Secondary	186 (17.1)
Tertiary	321 (29.5)
No formal education	211 (10.2)
Total	1088 (100)

Fig. 1



Etiology of childhood injury. RTI, road traffic injury.

Fig. 2



The sites of common injuries in childhood.

Table 3 Summary of treatment after injuries in children

Treatments	Number of respondents [*n* (%)]
Home	637 (58.5)
Hospital/clinics	299 (27.5) (immediately 4.3%, failed home treatment 4.3% when complications set in 18.9%)
Patent medicine stores	137 (12.6)
Herbal home	15 (1.4)
Total	1088 (100)

injurious agents and adequate education on preventive measures, whereas 25.2% believed that childhood injury is inevitable and is determined by fate (Table 3).

Discussion

In this study, about 90% of respondents were mothers, who, in our community, spend more time with their children. The prevalence of reported injury among children in this study was 55.3%, which is significantly higher than the 9% reported by Adesunkanmi and colleagues on hospital-based data. Our hospital-based trauma registry from September 1999 also showed that only moderate to severe childhood injuries usually from RTI presented to our hospital. This is in agreement with our premise that the hospital-based data provide poor evidence on the burden of child injuries in our community and may account for the lack of political will to intervene.

Majority of the injuries occurred in male children who were younger than 4 years of age, which is similar to findings in other studies [14,15].

The injuries occurred more at home and nearly three-quarters were witnessed by the parents, suggesting witness bias. A recall bias could have occurred in this study even though some parents witnessed the injury and many parents who were not attending the selected hospital and who could have useful contribution were excluded (selection bias). The one-quarter of cases not witnessed by parents were probably minor injuries that could have escaped notice (severity bias) as supported by local and international reports [8,16,17]. Despite these biases, this study has highlighted the significant burden of child injury in our community and shown areas for possible prevention strategies.

The majority of injuries in this study were from falls, which resulted in various degrees of sprains, abrasion, and laceration. Some injuries, which occurred outside the home environment, were usually minor and many children would have concealed these because of the fear of being reprimanded by their parents.

In China, drowning was the leading cause of childhood injury and deaths, with more than 30% of all potentially productive years of life lost to premature mortality [16]. Childhood injuries occurred more in children in larger families, children of young mothers, and parents with a low level of education as found in this survey, and these are potential target groups for prevention strategies. These factors are established as associated with morbidity and mortality in the injured child [18]. This is also in agreement with the finding of Scholer *et al.* [19], who found that children had at least a 50% increased risk of injury mortality if they were born to a mother who had less than a high school education. Injury-prevention efforts targeted toward children from economically disadvantaged populations and young parents are therefore suggested.

Nearly all the injuries were unintentional and extremities were affected in more than half of the cases because of falls. A hospital-based report by one of us (B.A.S.) showed the predominance of RTI and burns as the leading causes of injury deaths in children; this confirms the severity biases of hospital-based data in trauma studies as only the moderate to severely injured often present to the hospital [9]. This community-wide study eliminates this limitation of a hospital-based study by providing the actual prevalence of child injuries in the community.

Conscious efforts toward preventing these injuries are important to prevent unwanted morbidity and mortality [20]. Stevens *et al.* [21], in USA, reported that many parents are not utilizing anticipatory guidance or injury-prevention measures received from their child's physician because of inadequate/limited time to discuss injury-prevention measuress, which many parents wanted. This missed opportunity for needed care could be prevented in our setting (and possibly applicable in communities in other developing countries) by introduction of parental education on preventive measures such as use of baby gates, window guards, padding of hard surfaces, adjustment of water thermostat, and rules on the use of roads; these could be incorporated into the primary healthcare programs during immunization of children and at attendance of the growth and development clinics for children younger than 5 years. This could enable achievement of the fourth mellinium development goal, particularly reduction of under-5 mortality. The caregivers and the government should educate the parents and guardians on the need to report all significant injuries to the hospital. However, the definition of significant injury is a problem in this community in the face of poverty and ignorance. Perhaps, the newly introduced health insurance scheme, if extended to most citizens, would enable more people to present injuries to the clinics. A longitudinal study of indexed children will aid in determining the frequency of occurrence of multiple injuries per year.

Our broad-based community-wide study provided a balanced representation of the community taking into consideration the distance to the health facilities, attendance at the facilities, and the socioeconomic background of the respondents. We decided to use selected hospitals as the point for interview and not homes because locality home visits for enquiry of health status are often treated with suspicion and this may decrease the number of consenting respondents.

Conclusion

We found a high prevalence of child injuries in our community. These injuries were more common in larger families, children of young mothers, and parents or guardians with a low level of education. Achieving the goal of prevention of child injuries in the developing world will entail more health education targeted at risk groups; campaigns to alert stake-holders on its significant

burden in the community; and the design of effective, implementable prevention strategies.

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Conflicts of interest

There are no conflicts of interest.

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