ABSTRACT

Introduction / Background

Major unintentional, physically traumatic injuries are a leading cause of mortality and morbidity among children, resulting in adverse socio-economic implications on affected families and the country. Hence, an urgent need exists for the identification and control of major unintentional child injuries. However, the key constraint in advocating for such major child injury prevention programmes in Sri Lanka, is the lack of information and research evidence on these specific injuries.

Objectives

To describe the characteristics and risk factors of major unintentional, physically traumatic injuries of hospitalized children aged 5 to 12 years, residing in the Colombo district of Sri Lanka, and to examine the resulting post injury short term activity limitations, estimate its cost of care and identify community perceived factors associated with major child injuries in the same district.

Methods

Study included community-based, focus group discussions (FGDs) and in-depth interviews (IDIs), and hospital-based descriptive study of major injuries, case control studies for risk factors assessment, a prospective study for short-term activity limitations assessment, and an estimation of cost of care. Study setting was Colombo district and, study population included children aged 5 to 12 years, permanently residing in Colombo district.

For community-based studies, children aged 10 to 12 years, mothers and teachers of the study population and doctors, were selected, using multistage random sampling and purposeful sampling. Eight FGDs each, with 40 mothers and 40 children, and 4 FGDs with 19 teachers and IDIs with 4 doctors, were performed. Hospital-based studies included all eligible patients being hospitalized over a predefined time period. All hospital study components recruited children with major unintentional injuries as cases, while the case control studies in addition, involved patients with minor injuries (control group 1) and patients with no injuries (control group 2). Data collection was carried out for 3 months at 4 MOH areas and for 6 months at 4 hospitals. Short term activity

limitations were assessed at post injury 72 hours and 30 days respectively. Cost assessment was conducted over 3 months, with 1-month post discharge follow-up. Discussion guides, Dictaphone, structured, pre-tested, interviewer administered questionnaires and a cost diary were the study instruments utilized, while data collectors were trained pre-intern doctors.

Results

Content and thematic analysis of data from the discussions and interviews, followed by method triangulation, were conducted based on Braun and Clarke's six step framework (Braun and Clarke, 2006). It enabled the identification of important factors associated with major child injuries. Adverse child behavior including hyperactivity, poor attitudes of parents and child overprotection, strong influences from friends and peers for indulging in high injury risk activities, adverse physical environment in schools and negative teacher characteristics, adverse transport modes of school children and lack of road safety, and finally, the poor attitudes of the media and administrative authorities in the country, towards ensuring an injury safe culture for children, were raised as the main factors that resulted in the persistence of child injuries in the society.

Descriptive study of 672 children with major injuries, revealed the mean age of the patients as 8.8 years (SD $\pm$ 2.3 years), predominantly boys (70.4%). Common major injury types were fractures (75.4%), deep soft tissue injuries (17.6%) and burns (5.8%). Forearms (58.2%), legs (15.8%) and thighs (13.9%) were frequently affected, while main causes were falls on the ground (53.1%), road accidents (13.8%) and falls from heights (13.4%). Multiple major injuries were present in 12.1% of patients.

The 174 pairs each of the two case control studies, revealed that long term illness (OR = 5.0, CI: 1.5 to 17.3) and low monthly family income (OR = 3.3, CI :1.3 to 8.3) were risk factors when compared to children who had sustained minor injuries, whereas, academic performance of the child (OR = 0.35, CI: 0.21 to 0.6), low education level of mother (OR = 5.6, CI 3.2 to 9.9) and employed mothers (OR = 4.6, CI: 2.4 to 8.9) were found to be the risk factors, when compared with children with no injuries.

Of the 450 of these patients assessed for short term activity limitation, prevalence of 30-day partial activity limitation was 57.0% and complete activity limitation was 25.2%.

Cost assessment of 131 of these patients, revealed that per day per patient mean institutional cost was Rs. 7,694.86. The mean "out of pocket" expenditure per patient

per day was Rs. 553.00. The average "out of pocket" expenditure for a 30 day follow up was Rs. 2,162.00.

Conclusions and Recommendations

The common major, unintentional injury types were fractures and soft tissue injuries, caused by falls, road accidents and burns. Boys were predominantly affected. Majority suffered short term activity limitations during the first 30 days since the injury. Factors associated with child behavior, attitudes of parents, school environment, friends and peers and environment related factors were important factors identified as being associated with major child injuries. An average total cost of Rs. 8,248.00 had been incurred per patient, per day of hospitalization with major injuries.

From the current study findings, several recommendations can be suggested towards minimizing the burden and impact of major child injuries. The implementation of a system of identification of patients with serious injuries at the time of admission, further research on identification of the burden of post injury activity limitations in children and the resulting socio-economic implications, the planning and implementation of a strong and sustainable first aid training programme for selected groups in the community, improvement of the "Health promoting school" concept with the inclusion of an injury safe environment activities, reviewing the school curriculum to include practical sessions on safe living practices, ensure the construction of playing and ground equipment adhering to the child safety standards, further improvement of the hospital based cost assessment programme which has been initiated, and to formulate a method for periodic review of child injuries.

Key Words: Major Injuries, Unintentional, Childhood, Risk Factors, Sri Lanka.