Pattern and relevant factors of child injury – Hospital based study in accident and emergency service unit at Lady Ridgeway Hospital, Sri Lanka

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Abstract

The aim *of this study was to assess the Pattern and relevant associated factors of injuries among children admitted to accident and emergency service at Lady Ridgeway Hospital* ***Material and Methodology:*** *This descriptive cross sectional study was conducted in the accident service of LRH in 2016 with a total of 354 children admitted injuries. Children were recruited using systematic random sampling at the accident and emergency service unit. Data was analyzed using standard descriptive statistics on Statistical Package for Social Sciences version 21 and associations were analyzed using chi square test, taken p< 0.05 as significant.* ***Results:*** *Most of child injuries occurred at home (n=264, 74.6%) and Most frequently occurred injury was fall (n=243, 60%) followed by road traffic accidents (38, 10.9%) and cut injuries (39, 11.4%) respectively. Most of admitted children (n=248, 70.1%) were boys. Majority (n=182, 51.6%) of them were between 3 to 6 years of age and 103(29.2%) of children were less than three years of age. More than 90% of children were not suffering from chronic illness or disability.* ***Conclusions:*** *Majority of children admitted with injuries was boys and between 3 to 6 years of age .Three fourth of the injuries occurred at home and fall was the commonest injury. Majority of injured children were previously healthy.*

Key words: child, injury, pattern, factors

1. Introduction

Injury is defined as "the physical damage that results when a human body is suddenly subjected to energy in amounts that exceed the threshold of physiological tolerance or lack of one or more vital elements, such as oxygen"(Peden, 2008). Injuries can be categorized in number of ways according to intention, type, place of occurrence, age of the victim, causative factor for injury, activity at the time of injury occurred of the victim etc. International Classification of Diseases 10th revision (WHO, 2004) categorizes injury broadly as intentional and unintentional. Unintentional injuries are injuries occurred with no intention of harm. Such injuries are frequently called "accidents" in common usage (Lewit and Baker, 1995). Intentional injuries are the purposely inflicted injuries by him/herself or someone else (e.g. self-inflicted injuries, interpersonal violence, child abuse and neglect)

According to the World Report on Child Injury Prevention also low- and middle- income countries bear the biggest burden of child injuries while more than 90% of child injuries were occurring unintentionally (Peden, 2008). Children are not little adults. Their physical, physiological and mental structure and function greatly differs from adults. Children are at risk for unintentional injuries because of their normal curiosity and desire to gaining new skills. Young children have not fully formed physical coordination and cognitive abilities. Therefore they

are at greater risk of falls and developing bones and muscles may make them more susceptible to higher damage than adults (Arias, 2008). Globally, around 950 000 children under the age of 18 years die due to injury and violence each year (WHO, 2014). Rates of child deaths from injuries are four times higher in low and middle-income countries compared to developed countries (WHO, 2014). Majority (86%) of injury deaths among children were due to unintentional injuries (ALONGE. O at al 2008).

Epidemiology and pattern of child injuries of injuries varies with the age of child and region to region of the world. Infants are injured most often by suffocation. Toddlers most frequently by fallen and drown. As children become older they become more vulnerable to traffic injuries. Child injury was the fourth leading cause of death in children less than 5 years old in 2003 in Sri Lanka and accounted for 17.3% of the total burden of injuries in 2007 (Peden, 2008).

Childhood injuries lead to multiple problems and burden to the society (Vic S. Sahai, 2001). According to The World Report on Child Injury Prevention (Peden, 2008), nearly 50% of young children with unintentional injuries that present to a hospital are left with some form of disability. It is a burden to the family as well as to the society It is a burden to the family as well as to the society. These disabilities may be physical, mental or psychological. Death is the most severe end result of injury but it is not the only outcome or the most common. This study attempt to explore the pattern of unintentional child injuries in hospital based approach in the leading specialized children Hospital in Sri Lanka. Thus this paper identifies the socio demography of injured children, type of child injuries, and Family background of them their risk factors and estimates the burden faced by families. This information will help to design appropriate injury prevention interventions and mitigate the impact of child injuries to the society.

2. Materials and Methods

This cross-sectional study was conducted at Accident service in Lady Ridgeway Hospital (LRH) Sri Lanka. Study was conducted among children admitted to accident service with injuries at LRH during study period of one month 2016. Study sample was selected using Systematic random sampling technique and admission register at the Accident service OPD used as sampling frame. Study eligibility was limited to children admitted with unintentional injuries and severally injured children were excluded from study sample. Finally eligible sample of children for this study was 354.

A written informed consent obtained from parents of children. Pre tested interviewer administered questionnaire and check list were used as study instruments. Interviewer administered questionnaire contained sub sections of questions Socio demographic information of children, previous illness and Information of the current injury and other relevant factors. All questions were close ended questions and content of the Questionnaire was assessed by experts in the field of community medicine, medical administration and pediatric surgery and emergency medicine. Ethical clearance obtained from the ethical review committee at Faculty of Medicine, University of Colombo Sri Lanka.

Only one interviewer other than principal investigator was involved in collection of data to minimize the inter-observer bias. Data collection was done at the Accident service unit where patients are kept before transfer to special units. After checking the eligibility criteria, the parents were informed about the study, given adequate time to ask questions and verbal consent was obtained. Parent's informed that they are free to not participate at all or to withdraw from the study at any time despite consenting to take part earlier. Interviewer was very keen not to interrupt treatments of the child and other activities between child and parent while filling the questionnaire. Parents were ensured that personal data which can use to identify them will not be obtained.
Data analysis was done by using statistical package for social science SPSS version 20. Qualitative data expressed as frequencies and percentages .Quantitative variables presented as mean, standard deviation (SD), mode and range. Chi squared test used as tests of significance. $P < 0.05$ was considered significant. Overall knowledge was calculated by adding total marks of correct answers .Total mark was converted into percentages as follows

3. Results

This study was conducted at LRH accident and emergency service over period of one month time with using systematic random sampling method.

During the period of study 393 children were selected but only three hundred and fifty eight met the eligibility criterion of the study. Out of them, 354 responded, thus achieving a positive response rate of 98.8 %.

Variable	No N=354	%
Sex		
Male	248	70.1
Female	106	29.9
Age group (Years)		
≤3	103	29.2
3- ≤6	182	51.6
6- ≤9	54	15.3
9- ≤12	15	3.9
Ethnicity		
Sinhalese	225	63.8
Tamil	52	14.7
Moor	77	21.5
District		
Colombo	289	81.7
Gampaha	38	10.7
Kalutara	18	5.2
Puttalam	3	0.8
Others	6	1.6
Type of House		
Single story	258	73.1
Double story	73	20.6
Total	**354**	**100.0**

3.1 Socio demographic factors of injured children

Most of admitted children (n=248, 70.1%) were boys. Majority (n=182, 51.6%) of children admitted were between 3 to 6 years of age and 103(29.2%) of children were less than three years of age.

Table.1Socio demographic factors of injured children

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More than three quarter of admitted children (n=271, 76.6%) with injuries were either first or second one of the family. Majority of children (n=193, 54.5%) were living at school and one quarter of children (n=91, 25.7%) at home during day time

3.2 Description of family background of injured children

Most of the families were nuclear families with 60% having 1or 2 children in the family. Mother was the principal caregiver in 73% (n=282) of occasions, followed by grandparents (n=61, 15.88%).About three fourth of injured children were either 1st or 2nd child of the family and majority (90%) of the injured children were admitted with mother to the LRH.

Table 2. Family background of injured children

Variable	N =354	%
Family type		
Nuclear family	224	63.2
Extended family	130	36.8
Number of children in the family	N=354	%
1	86	24.3
2	126	35.6
3	106	29.9

4	26	7.3
>4	10	2.8
Birth order of the child		
1	145	41.0
2	126	35.6
3	59	16.7
4	19	5.4
>4	5	1.3
Principal caregiver		
Mother	282	73.43
Father	2	0.005
Grand parents	61	15.88
Relatives	6	0.15
Others	3	0.007
Parent admitted with the injured child		
Mother	321	90.7
Father	33	9.3
Total	**354**	**100.0**

3.3 Description of the past medical history status of the injured children

Only three children (0.8%) had disability and more than ninety percent (n=332, 93%) of children were free of chronic illness. Most of admitted children (320, 90.4%) had not past history of admitting with injuries to hospital

Table 3: Distribution of children according to their past medical history

3.2 Pattern of injuries and related factors of current injury

Presence of chronic illness	**N**	**%**
Yes	22	6.2
No	332	93.8
Presence of disability		
No	351	99.2
Yes	3	0.8
Previous history of injuries with hospital admissions		
Yes	34	9.6
No	320	90.4
Total	**354**	**100.0**

Most common type of injury was fall (n=243, 60%) followed by road traffic accidents accounted (38, 10.9%) and cut injuries (39, 11.4%) respectively. There were 12(3.4%) burn injuries and 31(8.7%) animal bite injuries during study period. Three fourth (264, 74.6%) of injuries has occurred at home (n=186, 52.5%) followed by school and preschool (30, 8.5%). Most of injuries (n=273, 76.1%) had occur during day time [06.01AM – 06.00 PM] out of that (157, 44.4%) of them occurred between 12 pm to 6 pm. At the time of injury majority of children (n=160, 45.2%) were engaged with playing at home while 52(14.6%) were doing leisure activities at home. Thirty (30, 13%) children got injured while activity at school while 29(8.3%) of children got injured while walking on road and 9(2.5%) at travelling in vehicle.

Table 4: Description of type of injury, place, and time of injury occurred

Type of injury	**No n=354**	**%**
RTA	38	10.9
Cut	39	11.4
Fall	215	60.7
Burn	12	3.4
Animal bite	31	8.7
Aspiration	6	1.7
Collision while running	4	0.6
Others	9	2.6
Place of injury		
Home	264	74.6
Preschool	11	3.1
School	19	5.4
Road	29	8.2
Vehicle	9	2.5

Others	22	6.2
Time of injury		
06.01AM – 12.00	116	32.7
12.01PM – 18.00PM	157	44.4
18.01PM - 24.00	79	22.3
00.01AM - 06.00AM	2	0.6
Total	**354**	**100.0**

3.5 Description of the activity of child during the time of injury

Activity	**N**	**%**
Playing at home	160	45.2
Leisure activity at home	74	20.9
Playing in the garden	52	14.6
Activity at the School/Pre school	30	8.5
Walking on the road	29	8.3
Travelling in vehicle	9	2.5
Total	**354**	**100.0**

Most of injuries (n=342, 96.6%) have occurred while someone was available with the child while only 12(3.4%) were injured when they were alone. Parent (Mother or father) was with the child in 143 (40.4%) occasions only while grandparents also present in 117(27%) occasions. Teacher was present at 27(7.6%) injuries with the child

4. Discussion

Multicenter study done at England, during period 2008-09 and 2012-13, there were almost 40,000 emergency hospital admissions boys were more likely to be admitted to hospital for injuries than girls, 55% compared with 45% respectively .Current injury majority of children (70.1%) were males and most common age group was between age 3 to 6 years 182(51.6%). This corresponds with results of study done by Kalubowila T.K et al., (2003) in Lady Ridgeway Hospital Sri Lanka accident service has found 696 (69.3%) of children were males and majority (52%) were below 5 years of age. hospital based study conducted by Dharmawardana (2007) at Lady Ridgeway Hospital with 425 children has found mean age of admitted injured children were 5.16 years and nearly two third (62%) of them were males .Community-Based Study on Family-Related Contributory Factors for Childhood Unintentional Injuries in an Urban Setting of Sri Lanka(2016) by Punyadasa D at el found higher proportion of injuries in the 25 to 59 months age group compared with that of 12 to 24 months age group. Therefore mean age of the most of the injury occurring and boyhood is almost similar in the regional studies as well as outside the region.

Current study revealed that most of children with injuries were first or second child of family and almost all of them were previously healthy children .Majority of them173 (48.9%) were living at home during day time. Most instances principal care giver was mother 79%.

Punyadasa D at el (2016) Presence of any adult in the family in addition to parents was also significantly associated with having lower occurrence of unintentional injuries in the study group (P = .013).Current study also reveals that occurrence of injuries (n=224, 63.2) among children from Nuclear family compared to Extended family (n=130, 36.8).This means more members other than parents in the family may prevent occurring injuries of children or treating without admitting to Hospitals. More than 95% of injured children in the current study were not having disability or any chronic illnesses and it is compatible with findings of Kalubowila T.K et al., (2003) of (99%) not had previous disability nor chronic illness (94%) at same study setting.

Current study 60% of families had either one or two children and among the injured children three quarter of injured children came with families with more than one child. Dharmawardana (2007) at el at same study setting Majority of injured children were (81%) first or second one of the families. Birth order and number of children among injured children is almost same.

According to World report on child injury prevention Motor vehicle injuries dominate among teens (Peden, 2008). Community based study done by

Pant (2015) at, Nepal to find out over 80% of injuries of children aged 1–4 years were occurred in and around home. The proportion of injuries occurring at home declined with increasing age. Current study also revealed 264 (74.6%) of injuries occurred at home and 160 (45.2 %) of them occred while Playing at home . Most of injuries have occurred at 12.00 to 18.00 PM (44.4%) compared to 6.00 to 11.00 AM (39%). Majority of injuries have occurred in and around home 271(63%) and out of injuries occurred outside home 152 (35%), 91 (59%) have occurred at road.

In the current study most of children admitted were due to fall 215(60%), 10% of injuries were due to RTA,11% of them had cut injuries and 5.9% of injuries were due to Animal bites. This corresponds with place of injury, majority were occurred at home 264(74.6%) only 10% of injuries were occurred at school or preschool. Current study further describes nearly two third of injuries occurred while child was either playing or doing leisure activity at home. More than 96% of injuries were occurred when someone was with the child and parents were present at 48% occasions. Hospital based Study in Turkey (2015) has found that 45.2% of admitted children were due to fallen and 40% of children had cut injuries. Difference of pattern of injuries could be due to variation of environmental condition in two different regions. The study was conducted in the Erzurum Regional Training and Education Hospital in Turkey (2015) on unintentional injuries in preschool age children has found that 45.2% of admitted children were due to fallen and 40% of children had cut injuries. Compared with current study cut injuries are bit high may be due to socio cultural difference at two regions.

5. Conclusions

This study was conducted in order to explore the Pattern and relevant factors of injuries among children who are admitted to accident and emergency service in Lady Ridgeway Hospital of Sri Lanka. There were total of 354 of children who included to the study and respondent rate was 98%.More than three quarter of admitted children were at less than 6 years of age with more males (male: female ratio was 7:3).More than 90% of children were previously healthy .Majority of them were living at home during day time (49%) under care of parents(79.2%).Most frequent place of injury occurrence was home (74%) and majority of injuries were falls (60%).Most of injuries (44.4%) were occurred at afternoon (12pm to 6 pm).Majority of injuries were occurred when someone is available (96.6%) in most instances parents were there (48.5%).Most of injuries occurred while Playing at home 160 (45.2).Therefore introduction of safety practices for injury prevention on children specially less than 6 years should be more concentrated on home environment .

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