International Journal Dental and Medical Sciences Research
Volume 3, Issue 1, Jan-Feb 2021 pp 856-862 www.ijdmsrjournal.com ISSN: 2582-6018

"Study of Common Household Injuries and Poisoning in Children in Tertiary Care Hospital of Western Maharashtra"

Dr. Karthik S Kolkur[1], Dr Sanjay Chavan[2], Dr Sharad Agarkhedkar[3]
[1]Resident, [2]Professor, [3]Professor & Head, Department of Pediatrics, Dr. DY Patil Medical College, Hospital & Research Centre, Pimpri Pune 411018,Maharashtra, India

Submitted: 02-02-2021 Revised: 15-02-2021 Accepted: 18-02-2021

ABSTRACT: Childhood injury is a major public health problem that requires urgent attention. Injuries are a health concern in every country around the world, affecting both developed and developing countries.Major causes of unintentional injuries include road traffic injuries, drowning burns, and falls in children up to14 years. Poisoning has also been the 3rd most common injury treated in emergency rooms for children <16 years of age. Common household injuries and poisoning lead to childhood morbidity and mortality that is preventable.This study will be conducted to study demographic variables in children brought with common household injuries and poisoning, to assess the incidental factors causing household injuries and poisoning in children, to assess outcomes in children with household injuries and poisoning.

METHODS:A cross-sectional observational study conducted on children between 6 months to 12years in casualty, paediatric OPD, and IPD, from August 2018 to Aug 2020.All the required information was recorded in the data collection form. Data will be entered and analysed using SPSS v 15 and P values <0.05 have been considered significant.

RESULTS: Among the injury participants, the age of the children was significantly associated with the cause of injury. (p=**0.030)and**Level of awareness about unintentional injuries, left a child with another child and Child education level were found to be significantly associated with cause of injury. (p=0.050,p=0.012 respectively)(p<0.001*).However, age and gender of the children did not significantly associate with outcome of injury. Among poison study participants age, gender, place of poisoning, treatment with antidote, type of poison is not significantly associated. **Conclusion:** TheUnintentional injuries and poisoning among children < 5 years is quite high with Males being the majority. Falls are the most common accidents in older children,head injury being major consequence. Majority of children recovered completely.Hydrocarbon ingestion (kerosene) was the most common poisoning and vomiting was most common presentation observed in our study. The findings warrant education of the general population about the risk of poisoning at home. The health and hospital authorities should take initiatives in creating awareness.

KEY-WORDS:Children, Household injury, Poisoning.

I. INTRODUCTION:

Childhood injury is a major public health problem that requires more attention. Injuries are a health concern in every country around the world, affecting both developed and developing countries, causing over 5.8 million deaths per year or 15,000 deaths per day in children.[1]

It is predicted that over the next two decades, the disease burden from injuries in many populations (especially low- and middle-income countries) will equal or exceed that caused by infectious diseases. This increasing burden of injuries in developing countries affects both adults and children. In 1990, injuries in these countries contributed to 13% of total disability-adjusted life years among children. It is expected that by 2020, this share will increase to 22%. [2]

Major causes of unintentional injuries include road traffic injuries, drowning burns, falls, poisoning. The leading cause of death in children upto14 years is road traffic injuries next to lower respiratory infections among children are the leading cause of presentation to the emergency department. [3] Child injuries place a significant burden on the overstretched health care system. So we need to develop and implement a child injury prevention policy. [4]

Among the major causes of injury, poison as a form of injurious agent stands 2nd with falls being the first and burns, drowning following on. Poisoning has also been the 3rd most common injury treated in emergency rooms for children less than 16 years of age.[5]

Accidental ingestion of poisons and household substances is a likely source of morbidity and mortality in children all over the world. [6]

New research indicates that various social and demographic factors like family size, socioeconomic condition, attention to the child as well as a storage place of poison are important risk factors which remarkably influence the acute household poisoning cases in children. [5]

Substances that are found in and around the home are most commonly involved in childhood poisoning.Common household injuries and poisoning lead to childhood morbidity and mortality that is preventable. [4]

This study will be conducted to demonstrate the clinical course and outcome of children with household injuries and poisoning over some time with the objective to assess the incidental factors causing household injuries and poisoning in children, to assess outcomes in children with household injuries and poisoning.

II. MATERIAL AND METHODS:

A cross-sectional observational study conducted on children between 6 months to 12years in casualty, paediatric OPD, and IPD, from August 2018 to Aug 2020.Sample size is calculated keeping prevalence as 36%, Error as 10% and confidence 95% which lead to 90.All children of both gender and ethnicity presenting with any household injuries or poisoning between 6 months to 12 years, Parents who give informed consent voluntarily were included in the study.Parents who do not give consent, Children>12years, Children discharged before completion of treatment, Children with unknown bite or food poisoning, Children with snakes, scorpion, and animal envenomation were excluded in the study. Ethical clearance was obtained from the ethical committee of Dr. D.Y. Patil Medical College, Pune, before the commencement of the study.Subjects were enrolled for study only after signing the informed consent form and those fulfilling inclusion criteria. All children aged 6months to 12 years with a suspected or alleged history of unintentional childhood injury admitted in paediatric casualty/ward were included in the study.

Relevant history was recorded as per proforma and a detailed clinical examination wasperformed. A total of 90 cases fulfilling the inclusion criteria were enrolled in the studyover 24 months. All the required information was recorded in the data collection form.Data will be entered and analyzed using SPSS v 15. Relevant biochemistry andhaematological investigation were performed as per proforma.

III. RESULTS:

In our study 68.5% parents were between 20-30 years of age,31.9% between 30-40 years of age.64.2% of children were less than 5 years of age and 36.2% were more than 5 years of age.57.1 % were males and 43.5% were females.In our study 75 % children were between 0-5 years of age and 25% between 6-12 years. 60 % were male and 40 % were female.**(Table 1)**

Age of the children was significantly associated with the cause of injury. Higher proportion of children (80%) who are above5 years reported fall as the cause of injury as compared to other children and causes. Higher proportion of males (60%) had fall as the cause of injury as compared to other causes and females. However, gender of the children did not significantly associated with cause of injury. **(Table 2)**

Level of awareness about unintentional injuries, left a child with another child and Child education level were found to be significantly associated with cause of injury. out of 68 parents who had low awareness level, higher number reported a fall as cause 39(58.8%), left the child with another child 28 (56%) out of 50. Out of 29 children being educated in school, high number 24 (82.8%) reported a fall as cause as compared to other causes of injury. **(Table 3)**

Out of 25 children who are above 5 years, higher number of children 24 (96%) reported recovered as the outcome of injury as compared to below 5 years children 40 (88.8%) out of 45 children. Out of 40 male children, 38 (95%) had recovered as compared to 27 (90%) females out of total 30 females. However, age and gender of the children did not significantly associate with outcome of injury**.(Table 4)**

In our study 85 % did not receive treatment with antidote compared with 15 % who had treatment with antidote. Based on the outcome of poison, 100 % of the children had recovered**.(Table 5)**

International Journal Dental and Medical Sciences Research
Volume 3, Issue 1, Jan-Feb 2021 pp 856-862 www.ijdmsrjournal.com ISSN: 2582-6018

TABLE 1: AGE AND GENDER WISE FREQUENCY DISTRIBUTION OF CHILDREN AND PARENTS IN INJURY AND POISON STUDY GROUP

Variable		Frequency and percentagen (%)
INJURY		
Age of children	<5 years	45 (64.3)
	>5years	25(35.7)
Gender of children	Male	40(57.2)
	Female	30(42.8)
Age of parents	20 - 30 years	48 (68.6)
	30 – 40 years	22(31.4)
POISON		
Age of children	0-5 years	15(75)
	6- 12 years	5(25)
Gender of children	Male	12(60)
	Female	8(40)

TABLE 2: ASSOCIATION OF AGE AND GENDER OF CHILDREN WITH CAUSE OF INJURY IN CHILDREN

Variables			Fall	Burns	Foreign body aspiration	Near drowning and drowning	p-value
Age of children	<5years	n (%)	20(44.4)	15(33.4)	7(15.6)	3(6.6)	**0.030***
	>5years	n (%)	20(80.0)	3(12.0)	1(4.0)	1(4.0)	
Gender of children	Male	n (%)	24(60.0)	11(27.5)	3(7.5)	2(5.0)	0.683
	Female	n (%)	16(53.3)	7(23.3)	5(16.7)	2(6.7)	

*Chi-square test; p<0.05 is statistically significant

TABLE 3: ASSOCIATION BETWEEN DIFFERENT VARIABLES AND CAUSE OF INJURY IN CHILDREN

Variable			Cause of injury				p-value
			Fall	Burns	Foreign body aspiration	Near drowning and drowning	
Level of awareness about unintentional injuries	Low	n (%)	39 (57.3)	18(26.5)	7 (10.3)	4 (5.9)	0.050*
	High	n (%)	0	0	1(100.0)	0	
Left a child with another child	Yes	n (%)	28(56.0)	17(34.0)	4 (8.0)	1(2.0)	0.012*
	No	n (%)	12(60)	1(5)	4 (20)	3 (15)	

International Journal Dental and Medical Sciences Research
Volume 3, Issue 1, Jan-Feb 2021 pp 856-862 www.ijdmsrjournal.com ISSN: 2582-6018

	In school	n (%)	25(83.4)	2(6.6)	1(3.4)	2(6.6)	
	No education	n (%)	15 (37.5)	16(40.0)	7 (17.5)	2(5.0)	

*Chi-square test; p<0.05 is statistically significant

TABLE 4: ASSOCIATION OF AGE AND GENDER OF CHILDREN WITH OUTCOME OF INJURY IN CHILDREN:

Variables			Outcome of injury			p-value
			Recovered	Recovered with sequalae	Death	
Age of children	<5years	n (%)	40(88.9)	2(4.4)	3(6.7)	0.665
	>5years	n (%)	24(96.0)	0	1(4.0)	
Gender of children	Male	n (%)	38(95)	0	2(5)	0.493
	Female	n (%)	27(90.0)	1(3.3)	2(6.7)	

*Chi-square test; p<0.05 is statistically significant

TABLE 5: FREQUENCY DISTRIBUTION OF TREATMENT AND OUTCOME IN POISONING STUDY GROUP

Variable		Frequency and Percentage n (%)
Treatment with antidote	No	17 (85)
	Yes	3 (15)
Outcome	Recovered	20 (100)

IV. DISCUSSION:

The finding of the children with accidental injuries in the present study was found that 64.2%(n=45) in the age group below 5 years, and the remaining 36%(n=25) found to be above 5 years, male children 57.1%(n=40) outnumbered females 43.5%(n=30) which is similar to Meenakshi M.S et al and Ahmed A et al studies.[7] [8]

In the present study age of the children was significantly associated with the cause of injury (p=0.030). Among accidents, a higher proportion of children 80%(n= 20) who are above 5 years reported fall as the cause of injury followed by burns 33.3%(n=15), foreign body aspiration 15.5%(n=7), near-drowning or drowning 6.6%(n=3) which is similar to a study by Giridara Gopal Parameswaran et al where it shows, Accidental falls (37.1%)followed by dog bites (25%), and road traffic injuries (18.9%)[1] , a study by Gopalkrishna Gururaj et al states 20 % of disabilities are due to injuries[9] and study by Meenakshi M. S et al results showed Road Traffic Accident (RTA) 22.2% is in higher proportion followed by Foreign body aspiration 7.8%, Burns 6.1%, Drowning 1.7 % in decreasing order of frequency.[7] In the present study, head injury was the major consequence of falls which was similar to in the study by Tandon et al, where, head injury was the major consequence of falls.[10]

In present study,18 children had burns where it is reported that most common sites involved are limbs and deep burns among them, 83% of cases recovered completely, 1% had a residual deformity and death in 16% of cases. Among foreign body aspiration coin ingestion was present in 70% of the cases, button batteries ingestion in 20% of the cases, safety pins and sharp objects in 10% cases was present which is similar to Sheriff A et al where 50% was due to coin ingestion and 50% due to organic matters. [11]

In present study, the accidental mode of injury is more common in below 5 years of age. Out of 45 children with age below 5 years, a higher number 39 (86.6%) of children had abrasion type of injury as compared to contusion and laceration which is similar to the study Anita Nath et al.[12] However, the age and gender of the children were not significantly associated with the type of injury in the present study.

In the present study, 17.4%(n=12) of parents had no education, 59.4%(n=41) with primary education,21.7% (n=15)with secondary education, and 2.85%(n=2) with a college education which is similar to the study by Juhee Hong et al where education of parents strongly associated with injury deaths in children. [13]

The occupation of a father was Laborer in 60.9%(n=42), 15.9%(n=11) were petty trader, 4.3%(n=3) were farmers and 14.2%(n=10) were drivers. The occupation of mother in 98.6%(n=68) was a housewife and 2.85 %(n=2) were laborer which is similar to the study by Juhee Hong et al where Parental occupation also had a significant effect on the risk in children aged 1–4 years. [13]

Findings of table 6, shows that level of awareness about unintentional injuries was low in 98.6%(n=68) of parents, 28.5%(n=20) of Parents did not leave their child with another child while 72.5 %(n=50) had left their child which is in contrast to the study by Carlsson A et al. [14]

Out of 25 children who are above 5 years, a higher number of children 24 (96%) reported recovered as the outcome of injury as compared to below 5 years children 40 (88.8%) out of 45 children. Out of 40 male children, 38 (95%) had recovered as compared to 27 (90%) females out of a total of 30 females. However, the age and gender of the children did not significantly associate with the outcome of the injury.

Acute poisoning most commonly noticed between 1 to 5 years age group and this was comparable with a study done by Gupta S.K et al [15] and Khadgawat R et al study showcases were in the age group of 1-5 years (79.85%).[16]

The male to female ratio among the poisoning cases from the present study was 1.5:1 i.e. male children are more often affected when compared to female children. Poisoning events are more common in male children because of their higher activity and the freedom they enjoy in our society which is similar to the other study results by Khadgawat P et al., and by Kumar V et al. [17][18]

It has been mentioned that the Peak incidence of accidental poisoning is in the second year of life and 85% of the accidental poisoning affects children under 5 years of age. The reported incidence of childhood poisoning in India varies from 0.3 to 7.6 %. Poisoning accounts for 0.03% mortality in infants, 0.16% in the 1-4 years of age, and 0.37% in 5-14 years of age group as per the statistics projected by the Government of India. [19]

In our study, Table no 13 describe, based on types of poison, most common were hydrocarbons 50%(n=10), followed by 20%(n=4) of household products and 15 %(n=3) were insecticides, which is in contrast with studies by Dr.Achinta Mandal et al where, 39(43.8%)major cases were organophosphorus poisoning.[20] and, another study by Sanjay Halder et al results showed that Commonest type of poisoning was household chemicals (73.68%) followed by hydrocarbon (64.71%). [21]

Out of 20, that the place of poisoning was 60 %(n=12) in the living room,30%(n=6) in the kitchen,5% (n=1)in the Yard, and 5%(n=1) at any other place and unavailable of poisoning products are 100% which is similar to the Kamyar Mansori et al study where poisoning incidents occurred in the living room or bedroom 50% (n=70) and the kitchen 41.4 % (n=58).[22]

The most common clinical presentation in the present study was vomiting 75%(n=15) which was similar to study Mathivanan M, Vignesh K[23]and another study by Achinta Mandal et al.[20]

In our study, 90 % (n=18) were from nuclear families and 10 %(n=2) from the joint family. 90 % (n=18) had household size less than or equal to 4 and 10 %(n=2) had more than 4. This was similar to the studies by Gupta R et al in which 60% of cases were from nuclear families and 40% from joint families.[24]

The socioeconomic status in 30 % (n=6)was lower-middle and 70 %(n=14) was upper-lower which is similar to the study done by Khan S et al.[25]

All the mothers were housewives and 55 %(n=11) of fathers were laborers and 45 %(n=9) of fathers had other occupation which is similar to the Khan S et al study where Maximum of the children's fathers was engaged in work(93.8%) and mothers were housewives(73.1%).[25]

The education among 85 %(n=17)parents was academic and 15 %(n=3) was non-academic which is similar to a study by, Khan S et al were, the majority of the children's fathers(40%) and mothers(26.9%) studied up to graduation. [25]

In our study based on the outcome of poisoning, 100 %(n=17) of the children had recovered which is similar to the study Halder S et al , S Budhathoki et al and by Dr. Achinta Mandal et al discharged or recovered from hospital.[21,26,20]

In our study, the association between the type of poison and type of the family (p=0.797), socioeconomic status(p=0.062) was not significant. Most of the children belonged to nuclear families 90% (18 out of 20) compared to joint familieswhich is similar to Meenakshi M. S et al study. [7]

In the present study, a higher number of children 10 (66.7%) reported the living room as a

place of poison when compared to other places. However, the age and gender of the children did not significantly associate with the place of poison(p=0.278, p=0.798) similar to a study by Rathore S et al. [27]

A major limitation of this study is that the injury was self-reported, and may have been underestimated due to recall bias. Due to fewer cases reported in a hospital, there is a limitation in poisoning outcomes. However, it surely gives information about the clinic epidemiological profile about childhood poisoning in our country and also emphasizes the need to perform further research on this important subject. As ours is corporate hospital, there is scarcity/less of poison cases admitted to the hospital when compared to Government hospital.

From the observations, results, and discussion of the present study, it was found that the environmental factors put the children at risk for injury athome. There are a number of interventions that can be done to overcome these problems. Policies and program to decrease child injuries should incorporate several approaches including the following-Environmental modification is an especially important strategy for home injuries,Health- promoting initiatives – Education, skills' development, and behavioral change programs for children (at schools) and parents should be included,Keeping in mind the inquisitive and explorative nature of children while they grow, parents need to be aware of keeping hazardous things and medicines, etc. out of reach of children,The government should enforce strict policies to sell kerosene in child-proof containers, and implement health education policies for parents/guardians.

V. CONCLUSION

Unintentional injuries and poisoning among children < 5 years is quite high.Males are more commonly involved than females in any type of unintentional injury.Falls are the most common accidents in older children and head injury was a major consequence of falls. Majority of children recovered completely. Accidents were more common in children from nuclear families.Hydrocarbon ingestion (kerosene) was the most common poisoning and vomiting was most common presentation observed in our study.The findings warrant education of the general population about the risk of poisoning at home. The health and hospital authorities should take initiatives in creating awareness.

REFERENCES:

[1]. Parameswaran GG, Kalaivani M, Gupta SK, Goswami AK, Nongkynrih B. Unintentional childhood injuries in urban Delhi: A community-based study. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine. 2017 Jan;42(1):8.

[2]. Injuries among children in Karachi, Pakistan—what, where and how J.A. Razzaka,*, S.P. Lubyb , L. Laflammea , H. Chotanib

[3]. Ellsässer G. Epidemiological Analysis of Injuries Among Children under 15 Years of Age in Germany--The Starting Point for Injury Prevention. Gesundheitswesen (Bundesverband der Arzte des Offentlichen Gesundheitsdienstes (Germany)). 2006 Jul;68(7):421-8.

[4]. WHO-UNICEF-children and poisoning world report on child injury prevention world health organization –in 2008

[5]. Peden, M.; Oyegbite, K.; Ozanne-Smith, J.; Hyder, A.A.; Branche, C.; Rahman, A.K.M.F.; Rivara, F.; Bartolomeos, K. World Report on Child Injury Prevention 2008; World Health Organization: Geneva, Switzerland, 2008; p. 203.

[6]. Retrieved from https://www.who.int/violence_injury_prevention/child/injury/world_report/Poisoning accessed on 3/02/2020

[7]. Meenakshi MS, Senthilprabhu R. Profile of accidental injuries and poisoning in children and analysis of the predisposing factors. International Journal of Research in Medical Sciences. 2017 May 27;5(6):2747-52.

[8]. Ahmed A, Arif A, Patti J, Tyrone F, Syed M. The Epidemiologyof Unintentional Non-fatal Injuries Among Children in the South Plains/Panhandle Region ofTexas. Texas J Rural Health 2003;21:(2):31-41.

[9]. Gururaj G. Injury prevention and care: an important public health agenda for health, survival and safety of children. The Indian Journal of Pediatrics. 2013 Mar 1;80(1):100-8.

[10]. Tandon JN, Kalra A, Kalra K, Sahu SC, Nigam CB, Qureshi GU. Profile of accidents in children. Indian Pediatr. 1993;30(6):765-69.

[11]. Sheriff A, Rahim A, Lailabi MP, Gopi J. Unintentional injuries among children admitted in a tertiary care hospital in North Kerala. Indian journal of public health. 2011 Apr 1;55(2):125.

[12]. Nath A, Naik VA. Profile of accidents in children less than five years of age belonging to a rural community in Belgaum district. Indian J Community Med 2007;32:133-4
[13]. Hong J, Lee B, Ha EH, Park H. Parental socioeconomic status and unintentional injury deaths in early childhood: consideration of injury mechanisms, age at death, and gender. Accident Analysis & Prevention. 2010 Jan 1;42(1):313-9.
[14]. Carlsson A, Dykes AK, Jansson A, Bramhagen AC. Mothers' awareness towards child injuries and injury prevention at home: an intervention study. BMC research notes. 2016 Dec;9(1):1-6.
[15]. Gupta SK, Peshin SS, Srivastava A, Kaleekal T. A study of childhood poisoning at national poisons information centre, All India Institute of Medical Sciences, New Delhi. J Occup Health. 2003;45:191-6.
[16]. Khadgawat R, Garg P, Bansal P, Arya A, Choudhary B. Accidental poisoning. Indian pediatrics. Volume-31 December 1999:1555-1557.
[17]. Khadgawat P, Garg P, Bansal P, Arya A, Choudhary B. Accidental poisoning. Indian Pediatr. 1994;31:1555-
[18]. Kumar V. Accidental poisoning in south west Maharashtra. Indian Pediatr. 1991;28:731-5.
[19]. National Crime Records Bureau(2010). Accidental deaths and suicides in India. New Delhi: Ministry of Home affairs, Government of India; 2010
[20]. Mandal A, Pal AC, Das PK, Dutta AK. Clinico-epidemiological profile of poisoning in children in a rural-based medical college and hospital. IOSR J Dent Med Sci. 2016;15:50-.
[21]. Halder S, Samanta S, Ghosh C, Datta A. Profile and Outcome of Childhood Poisoning Along with Bites and Stings Attending a Rural Medical College, West Bengal, India Original Research.
[22]. Mansori K, Soori H, Farnaghi F, Khodakarim S. A case-control study on risk factors for unintentional childhood poisoning in Tehran. Medical journal of the Islamic Republic of Iran. 2016;30:355.
[23]. Mathivanan M, Vignesh K. Epidemiological profile of acute poisoning in children admitted to a tertiary care hospital. Int J Contemp Pediatr 2019;6:829-32
[24]. Gupta RK, Gupta R. Home related accidents during infancy. JK Science. 2004;6(2):67-9.
[25]. Khan S,Tauheed N,Nawab S,Afzal S, Khalique N.Domestic accidents among under-5 year children: a study on the modern day epidemic.Int J community Med Public Health 2019;61529-35.
[26]. Budhathoki S, Poudel P, Shah D, Bhatta NK, Dutta AK, Shah GS, Bhurtyal KK, Agrawal B, Shrivastava MK, Singh MK. Clinical profile and outcome of children presenting with poisoning or intoxication: a hospital-based study. Nepal Med Coll J. 2009 Sep;11(3):170-5
[27]. Rathore S, Verma AK, Pandey A, Kumar S (2013) Pediatric poisoning trend in Lucknow District, India. J Forensic Res 4: 179.