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Original Research Article

Retrospective study of impact of social factor in pediatric trauma at teaching hospital of Vindhya region of India

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ABSTRACT

Background: Pediatric trauma i.e. Fall, RTA, burn and other type of trauma is primarily seen in neglected young children, these children's are unattended to and unprotected at home due to overburdened parents in nuclear family busy with various household and outdoor jobs. In present study aims to analyse the different aspect of social factors that related to trauma in pediatric age group.
Methods: The present retrospective study was carried out in 367 patients of the age group <1-15 years during the period 2015-2016.A detailed history taking (from parents/relatives/children) and examination was done and all patients were assessed with regards to their age, sex, mode of trauma/injury, type of injury, site of trauma, place of trauma, and mortality, type of family, number of family members, parents job to create data. The children were classified according to age group. Modes of trauma were divided in groups; the types of injury were divided into subgroups. The places of trauma were divided into the following: Home, road, farm, school/playground or park and others.
Results: Out of total 36.96% of cases were pediatric trauma, (127) belongs to the age group1-5 years. In the less than one year age group burns was the major cause of trauma (47.05%). Boys was dominating (63.21%) over girls (36.78%) on whole but girls were at an increased risk of burn injuries (32.59%) than boys (14.66%) most of the pediatric trauma occurred when the child was unaccompanied (59.9%) as compared to accompanied with elders (40.1%)unaccompanied male was more prone to injury than an accompanied. Head injury was (47.41%) and incidence of fall was (53.45%). Mortality rate was maximum (70.6%) in age group less than one year followed by 11-15 years age group (17.0%). mortality rate was higher in female15.67% as compare male 12.9.
Conclusions: The study shows that needs to focus on maintain data analysis to make a policy for management of pediatric trauma, incidence of all type trauma can be reduced by awareness of society members, a large number of public illiterate and unaware even when literate to take care of children's. Needs to make special awareness program to give a massage to society make well designed home and playground don't make children's free to play in road or other places except to play ground.

Keywords: Burn, Pediatric trauma, Social factors

INTRODUCTION

About 5 million children die from trauma each year the burden of child injuries in India is not clearly known because our knowledge is inadequate about their epidemiology.[1] Trauma is the leading cause of death in this age group in the United States greater than all other diseases combined.[2] National centre for statistics and analysis, 2015, NCRB, 2015, Office of the Registrar General and Census Commissioner, 2015 shows that the

total number of deaths in 2014 was 12 times greater than in 1970 with an average annual compound growth rate (AACGR) of 6%, and the fatality rate in 2014 was 5.2 times greater than in 1970 with an AACGR of 3.9%.[3]

Pediatric trauma is primarily seen in neglected young children, these children's are unattended to and unprotected at home due to overburdened parents in nuclear family busy with various household and outdoor jobs. Preschool and school going children's are more prone to injury during lunch break and just after school hours specially they try to cross the road as they are unaccompanied by elders then. Teen age groups often come to school on bicycle or bikes thus increasing the likelihood of road traffic accidents. In present study aims to analyze the different aspect of social factors that related to trauma in pediatric age group.

Pediatric burns are also known to occur due to several social factors, including lack of proper supervision, use of common areas for both cooking and sleeping, traditional habits of cooking over low stoves or in large pots, consuming food while sitting on the floor, transferring hot liquids in open containers from one place to another, and sterilization of milk by boiling rather than pasteurization. fall from terrace, during play without supervision and in road.[4]

METHODS

The present study was carried out in 367 patients of the age group <1-15 years admitted to the general surgical ward and burn unit of Sanjay Gandhi Memorial Hospital, associated Shyam Shah Medical College Rewa India during the period 2015-2016.

A detailed history taking (from parents/relatives/children) and examination was done and all patients were assessed with regards to their age, sex, mode of trauma/injury, type of injury, site of trauma, place of trauma, and mortality, type of family, number of family members, parents job. The children were classified according to age group as: I (<1 year), (1-5 years), (6-10 years) and (11-15 years). Modes of trauma were divided as: Fall from height, road traffic accident (RTA), burn, assault (sharp, blunt) the types of injury were divided into subgroups Head Injury Chest Injury Abdominal injury Multi organ Injury Burns. The places of trauma were divided into the following: Home, road, farm, school/playground or park and others. The mortality data were shown according to different age groups as described earlier and according to the sex.

RESULTS

Trauma patient constituted 16.78% of all admission in general surgical ward during the study period, pediatric trauma patient was about16.35% of total no. of admission of this about 36.96% of cases were pediatric trauma cases maximum no. of pediatric trauma cases were in the month of May and June.

Maximum no. of cases (127) belongs to the age group1-5 years fallowed by 6-10 years (123) There was a marginal decrease in the incidence of fall from height as the child age i.e. from35.89% at 1-5 years to 25.64% at 11-15 yrs. In the less than one year age group burns was the major cause of trauma (47.05%) whereas fall from height contributed to most of the trauma cases over the next 14 years.

Table 1: Age group wise distribution of causes of pediatric injury.

Age (years)	Fall	RTA	Assault	Burns	Total
<1	6	1	2	8	17(4.63%)
1-5	56	35	7	29	127 (34.60%)
6-10	54	46	7	16	123(33.41%)
11-15	40	24	11	25	100(27.25%)
Total	156(42.50%)	106(28.89%)	27(7.36%)	78(21.25%)	367(100%)
Cause of injury					
Male	103	74	21	34	232(63.21%)
Female	53	32	6	44	135(36.79%)
Total	156(42.50%)	106(28.89%)	27(7.36%)	78(21.25)	367(100%)
Type of injury					
Head injury	93	63	18		174=47.41%
Chest injury	11	5	2		4.10%
Abdominal injury	18	5	5		28=7.63%
Multi organ injury	34	33	2		69=18.80%
Burns				78	21.25%

In sex wise distribution boys was dominating (63.21%) over girls (36.78%) on whole but girls were at an increased risk of burn injuries (32.59%) than boys (14.66%) most of the pediatric trauma occurred when the child was unaccompanied (59.9%) as compared to accompanied with elders (40.1%) unaccompanied male

was more prone to injury than an accompanied. As for as female children were concerned being accompanied/unaccompanied made little difference to the incidence of trauma.

Head injury was the most common injury sustained among pediatric trauma (47.41%) and incidence of fall was the cause of injury in (53.45%). Most of the pediatric patient suffers burns to less than 25% of the TBSA.

Table 2: Distribution of accompanied and unaccompanied patients.

Cause of injury	Accompanied	Unaccompanied
Fall	110	46
RTA	54	52
Burns	37	41
Assault	19	8
Total	220(59.9%)	147(40.1%)

Table 3: Age and sex wise distribution of accompanied and unaccompanied patients.

Age (years)	Male		Female	
	Accompanied	Unaccompanied	Accompanied	Unaccompanied
<1	3	3	6	45
1-5	40	37	22	28
6-10	66	22	23	12
11-15	48	13	12	27
Total	157(42.78%)	75(20.44%)	63(17.17%)	72(19.62%)

Table 4: Background related to trauma.

Variables		No. of cases (n=367)	%
Fathers occupation	Farmer	183	49.86
	Laborer	121	3297
	Office worker	38	10.35
	Shopkeeper	12	3.27
	Driver	6	1.63
	Garbage collector	4	1.09
	Photographer	1	0.27
	Mechanic	1	0.27
	Cook	1	0.27
Mothers occupation	House wife	220	59.95
	Office worker	37	10.08
	Laborer	110	29.97
Family size (members)	1-5	166	45.23
	6-10	150	40.87
	>10	51	13.89
Place of sustaining trauma	Kitchen	50	13.62
	Living room	48	13.08
	Terrace/tree/other	80	21.79
	Bathroom	1	0.27
	garden	10	2.72
	Agriculture farm	38	10.35
	Road	110	29.97
	Play ground	9	2.45
	Class room	2	0.55
	Working site	19	5.18
Family type	Joint	219	59.67
	Nuclear	148	40.33
Residential locality	Rural	258	70.30
	Urban	109	29.70
Type of house	Kachcha	259	70.57
	Pakka house	51	13.89
	Pakka house designed	45	12.26
	Tent	12	3.27

Mortality rate was maximum (70.6%) in age group less than one year followed by 11-15 years age group (17.0%). For every 100 patients brought to the hospital within 6 hours of injury 13.01% death occurred, while for patients brought to the hospital after 6 hours 16.33% die. When mortality compared sex wise then noted that mortality rate was higher in female 15.67% as compare male 12.9% in about 6% cases cause of trauma was domestic violence in which type of trauma was different i.e. burn, head injury chest injury abdominal injury multi organ injury.

Table 5: Mortality rate of different age groups.

Age (years)	Total no. of patients	No. of deaths
<1	17	12(70.6%)
1-5	127	14(11.02%)
6-10	123	8(6.50%)
11-15	100	17(17.0%)
Total	367	51(13.89%)

Table 6: Sex wise distribution of mortality.

Sex	Total	Total no. of death
Male	232	30(12.93%)
Female	135	21(15.56%)
Total	367	51(13.89%)

DISCUSSION

In India, children between 1 and 15 years constitute about 35% of the total population.[5,6] There are many studies on trauma in children; they mainly represent the scenario in developed countries. There is a paucity of studies from developing countries like India. The concept of a pediatric trauma registry and Pediatric Trauma Care centers are relatively uncommon in our country until

now. There is the lack of proper trauma database in India and even in Indian studies the population covered was metro city based .[7]

Home being the most common place of injury nationally and internationally.[8,9] Maximum cases has been reported in 1-2 years age group and RTAs as the most common cause.[10,11] However in our current study we found that maximum cases (34.60%) in 1-5 years age group falls accounted maximum for 42.50%of injuries in the pediatric age group and RTAs (28.89%). The predominant cause of pediatric trauma in this study was fall as in many parts of the world, most childhood injuries treated in hospitals are due to falls that occur mainly at home.[12] A mixed intervention consisting of safer play areas, safer construction, and safer furniture for sleeping and playing and improved supervision has been recommended.[13] Improving road safety will always go a long way in reducing overall trauma burden; this may not be enough in pediatric trauma especially up to 12 years of age group, in the setting as well as some others.[14]

Efforts should be directed at reducing childhood injuries in the home. In developing countries, provision of crèches, supervised nurseries at workplaces, increased awareness of risk factors in the peri-domestic environment, adequate parental supervision and child-friendly homes with safeguards on windows and covered balconies in multz QDCWi-storey buildings have been suggested. Large impacts of simple accident prevention programs in the peri-domestic environment are exemplified by the 'Kid's Can't Fly' campaign of York, England.[15] Improving student-to-teacher ratios to enhance supervision and legislation to discourage physical abuse by teachers have been recommended. Equipment functionality should be actively sought to decrease sport-related injuries. Play floors should be made of materials that cushion a fall effectively. Loose-fill surfacing materials of 12-inch depth made of sand, pea gravel, wood and shredded rubber products are recommended.

Many studies have been done from Bangladesh, Iran, Nigeria, Thailand Singapore and from major Indian cities, and these studies have found boys to be more commonly injured then girls.[16-27] In our study too, boys were more commonly (63.21%) hospitalized than girls (36.79%), Male children are given more freedom, opportunities, and facilities than females in all aspects in our society. Likewise, they are more exposed to potential risk factors and potential environment suitable for trauma such as playing on roads, rooftop, on trees, or near construction sites. The cultural role of males as bread earners could also be responsible for increased likelihood of being exposed to potentially risky environment.[28,29]

In this study maximum children's were injured in group of farmer, house wife and belongs to rural area living in kachca house even in public living in joint family injured more as compared to other professionals suggest lack of attention exposure to outdoor play specially in road and public places other than play ground that may be lack of knowledge in illiterate and poor knowledge about safety and security. Farmers work in agriculture farm and left kids at home alone or accompanied in field without supervision so have more prone to injury. This could be explained by the lack of safety measures in unsupervised kids. Factors predisposing to pediatric trauma have rarely been investigated and currently there are no injury prevention programs for pediatric population. The high incidence of pediatric trauma on roads and falls indicates the need for more supervision during playing and identification of specific risk factors for these injuries in our setting. School-based programs with cartoons and comics characters should be done on regular basis to educate the children regarding road safety measures. Parents need to be counseled regarding giving either two wheelers or four wheelers to their children only after they reach the legal age of driving. Active participation of children in these programs can keep the momentum up to prevent the pediatric road injuries. Play areas and children parks should be properly walled to prevent injuries. A significant proportion of fall-related injuries in younger children resulted during unsafe work-related activities in our study. Child labor needs to be addressed on an urgent basis secondly worker safety norms need to be implemented strictly.

Road traffic injuries are predictable and preventable, the magnitude of social burden can be bring down by focusing on human, machine, and environmental components like lifestyle, condition and type of vehicle, and road condition, attitude of driver, talking in mobile phones while driving, age of driver, knowledge of traffic rules, not using road safety precautions are some of the influential factors which lead to road traffic injuries. As the children are in growing age and in the stage of social and intellectual development, succumbing to injuries has impact on social development.[3]

In 2015, WHO research studies shows that in India vehicle ownership is 6 per 100 person but road traffic fatalities are 11 per 100 person, while compared to other countries where much higher vehicle ownership rates than India but lower road traffic injury fatality rates. This indicates that increase in vehicle ownership need not be a reason for increase in fatality rates. In the 1998 study of highways the proportions of motor vehicle occupants and vulnerable road users were 32 and 68 per cent respectively, whereas the numbers for urban areas were 5%-10% vehicle occupants and the rest were vulnerable road users.[4]

Approximately 90% of burns are caused by household accidents. In children younger than three years, scalds are responsible for most of the burns, Scald burns usually occur when a child accidentally pulls the container with hot liquid onto himself.[30,31] It may also result from bathtub submersion injuries usually by an unattended child. In older children, flame burns are more common. Firecracker injuries and household fires are the common

etiologic factors for these burns, which are often of full thickness.[32]

In contrast to the reductions in childhood mortality from trauma by up to 50% in high-income countries (HICs) between 1970 and 1995, the burden and pattern of childhood injuries are just now being studied in low and middle-income countries (LMICs).[33] Though malnutrition and infections are still the leading causes of mortality in LMICs traumatic deaths are also five times higher than industrial nations.[34]

In this study overall mortality rate was (13.89%) the maximum mortality rate of the (70.6%) was noticed when trauma was sustained in <1-year age group. this may be because they have inadequate reserves to tide over major stress. For male trauma patients12.93% end up dead but for female 15.56% die. This is usually due to the delay in bringing the female child for treatment. In this area as elsewhere in India a male child is given more attention and care than a female child.

CONCLUSION

Like developed countries needs to focus study on pediatric trauma to know factors responsible and maintain data to provide policy makers so it will be easy to make policy for prevention and management. As other studies also in our study high incidence of trauma noted in age up to one year or less occurred at home. In our study maximum children's were injured in group of farmer, house wife and belongs to rural area living in kachca house even in public living in joint family injured more as compared to other professionals suggest lack of attention exposure to outdoor play specially in road and public places other than play ground that may be lack of knowledge in illiterate and poor knowledge persons about safety and security. These factors belongs to society status, literacy and lack alertness because pupils unaware to mortality and morbidity of trauma.

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