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Original Research Article

Prevalence of road traffic accident in children: retrospective study in tertiary centre

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ABSTRACT

Background: Road traffic accidents (RTA) are the leading cause of unnatural deaths in the world and a major burden on the world's economy. The aim was to study the prevalence of road traffic accident among children.
Methods: It is a retrospective cross sectional study. Data collected from the hospital records in PICU. Children studied are either admitted directly for road traffic accident or referred to our centre for complicated injuries. children of 1 to 18 years are studied, details of address, locality (either rural, urban) road safety precautions used, mode of injury, type of vehicle, type of injury, number of passengers, complications, outcome of injury are collected and entered in prescribed proforma, and impact of each one is analysed and magnitude is studied. Study period was from June 2014 to June 2016.
Results: This study shows that road traffic accident prevalence is more in 15-18 year age group (31%), and males are affected more commonly (79.5%), among these majority of children were from rural area (73%), more common type of injury were complicated injuries (85.1%). Children travelling in 2 wheelers were affected more (74.9%). Results analysed with age of victims and type of injury, p value <0.05 is considered significant.
Conclusions: To bring the mortality rate down, children especially with rural background should be made aware about the importance of strict compliance to traffic rules and regulations. Government need to start implementing traffic rules awareness programme among rural people.

Keywords: Accidents, Children, Death, Education, Fatalities, Injury

INTRODUCTION

Road traffic accidents (RTA) are the leading cause of unnatural deaths in the world and a major burden on the world's economy. It is also the foremost cause of unnatural deaths in children, contributing to an annual loss of more than 260,000 lives in the 0 - 19 year age group. India contributes one-sixth of the world's population, 29.5% of which belongs to the 0 - 14 year age group.[1] Road accidents are extremely common and the injuries suffered by those involved can differ greatly from minor whiplash to fatal injuries. Accidents happen as a result of the combination of several factors and are often not caused by a single cause. Contributing factors for accidents to occurs includes road conditions, lack of knowledge of traffic rules, speed of vehicle, number of passengers, type of vehicle, age of driver. Now a-days we have seen so many adolescent children driving vehicle which might be one of the important cause. The main reason for this may be because they are still growing and not mature enough. These may succumb children to severe type of morbidity, and deformities which impairs their social and psychological development. According to the World Health Organization's (WHO's) road traffic injuries defined as "fatal or non-fatal injuries incurred as a result of a road traffic crash" and road traffic crash is defined as "collision or incident that may or may not lead to injury, occur on a public road and involving at least one moving vehicle". In developing countries, road use is dominated by two-wheel vehicles (Worley, 2006) such as

motorcycles. Motorcyclists are at high risk in traffic crashes, particularly for head injury. It has been reported that road traffic injuries are the second most frequent cause of death in the 5 - 14 year age group in India.[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%. In India the proportion of fatalities for the age group 15 - 59 is greater than their representation in the population and less for the age groups 0-14 years (1:7.9 of the population) and >59 years (1:1.4 of the population). In the USA children <15 years have a much lower representation in RTI fatalities as compared to their ratio in the population (1:5.1) but all the other age groups have a slightly higher representation3.The reason for lower incidence in India is not known, more number of studies need to conduct on this.

METHODS

The present study is an analysis of case details of 195 children who admitted and treated in PICU of SSIMS and RC, Davangere, Karnataka, India from period of June 2014 to June 2016. Data collected from in patient registers and case notes of all cases in medical record section. children of age group 1 to 18 years are included who are admitted for RTA with various type of injuries. Injuries were divided in to simple and complicated depending on severity and requirement of surgical interventions, children were divided according to age (Group 1) 1-5 years, 5-10 years (group 2), 10-15 years (group 3), >15 years (group 4), further divided according to type of injury in to simple (group 1) and complicated (group 2), wounds which are abrasions, does not require intensive care or surgical interventions were considered as simple, and those which require intensive care of wound like suturing under anaesthesia, fractures, intracranial injuries, head injuries ,lacerated facial injuries etc. were considered complicated injuries.

Children who got primary care at the site of accident or not is also considered, further divided in to groups according to type of vehicle in which they have travelled, pedestrian (group 1), 2 wheeler (group 2), 3 wheeler (group 3), 4 wheeler (group 4). Victims are divided again in to groups according to area from which they came, rural (group 1) or urban (group 2) and also categorised according outcome of injury either survived (group 1) or died (group 2). Results were analysed using epi info 6 software. each variable is compared with type of injury and magnitude of contributing factors were calculated p value <0.05 is considered significant.

RESULTS

Out of 195 victims of this study, 155 (79.5%) were boys and 40 (20.5%) were girls, out of them 143 (73.3%) were resident of rural area and 52 (26.7%) were resident of urban area.

Table 1: Profile of road traffic accident fatalities in children.

Parameters		Simple injury	Complicated injury	N	p value
Age (in years)	1-5	0 (0.0%)	14 (100.0%)	14 (100.0%)	0.125
	5-10	6 (9.8%)	55 (90.2%)	61 (100.0%)	
	10-15	10 (17.2%)	48 (82.8%)	58 (100.0%)	
	15-18	13 (21.0%)	49 (79.0%)	62 (100.0%)	
Sex	Male	22 (14.2%)	133 (85.8%)	155 (100.0%)	0.600
	Female	7 (17.5%)	33 (82.5%)	40 (100.0%)	
Place	Rural	22 (15.4%)	121 (84.6%)	143 (100.0%)	0.739
	Urban	7 (13.5%)	45 (86.5%)	52 (100.0%)	
Type of vehicle	Pedestrian	2 (18.2%)	9 (81.8%)	11 (100.0%)	0.018
	Two wheeler	16 (11.0%)	130(89.0%)	146 (100.0%)	
	Three wheeler	5 (41.7%)	7 (58.3%)	12 (100.0%)	
	Four wheeler	6 (23.1%)	20 (76.9%)	26 (100.0%)	
No. of passengers	<3	10 (9.8%)	92 (90.2%)	102 (100.0%)	0.037
	3-5	19 (20.4%)	74 (79.6%)	93 (100.0%)	
Primary care	Available	3 (33.3%)	6(66.7%)	9(100.0%)	0.111
	Not Available	26(14.0%)	160 (86.0%)	186 (100.0%)	
Intervention	Conservative	28(15.6%)	152(84.4%)	180(100.0%)	0.353
	Surgical	1 (6.7%)	14 (93.3%)	15 (100.0%)	
Outcome	Improved	29 (14.9%)	166(85.1%)	195 (100.0%)	
	Total	**29 (14.9%)**	**166 (85.1%)**	**195 (100.0%)**	

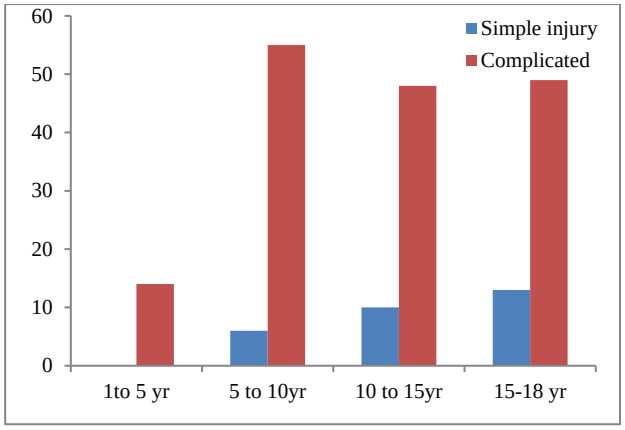

Figure 1: Correlation of age with type of injury.

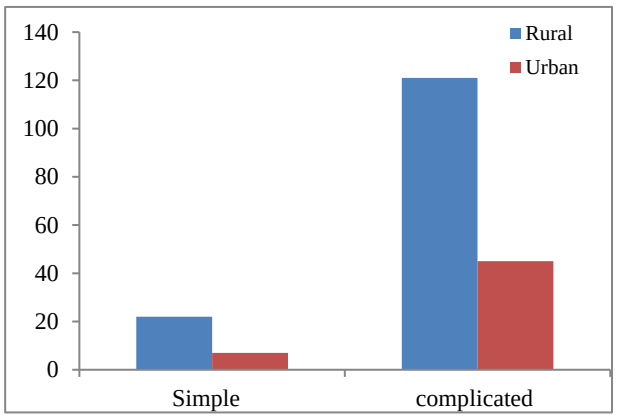

Figure 2: Correlation of type of injury with locality.

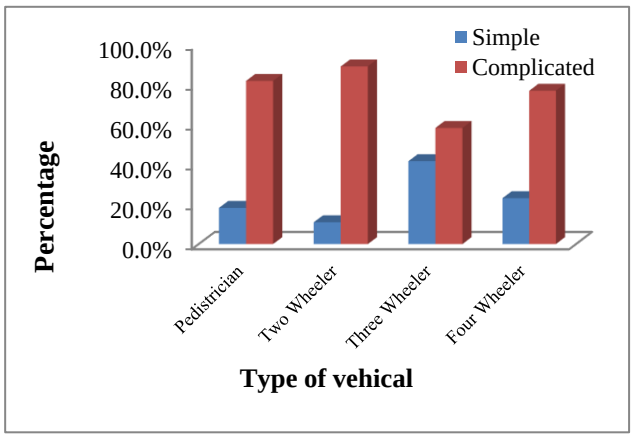

Figure 3: Correlation of type of injury with type of vehicle.

Road traffic accident injuries were more common in boys than girls and rural population is involved more.15 - 18 year age group children were involved more (31.8%), followed by 5-10 years (31.3%) even though statistically not significant. Among the victims 85.1% had complicated injuries and 14.9% had simple injuries. Victims of 2 wheelers were more injured (74.9%) followed by four wheeler victims (13.3%). 86% of victims with complicated and 26% of simple injuries were couldn't get primary care at or near the site of accident, and passengers with number less than 3 in one vehicle were injured more .co relation between no.pf passengers and type of vehicle with type of injury is statistically significant (p value <0.05).

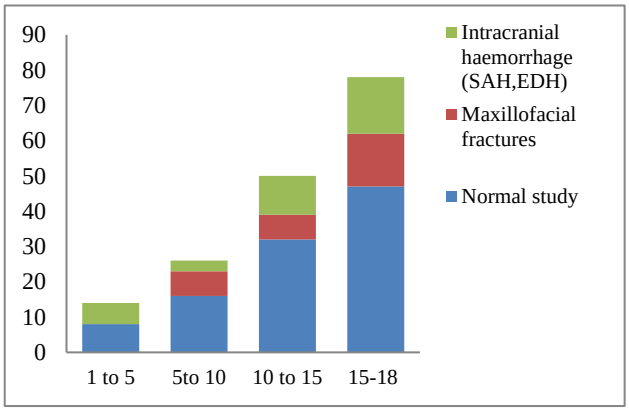

Figure 4: Correlation of severity of injury with age.

DISCUSSION

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.

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.[4] This indicates that increase in vehicle ownership need not be a reason for increase in fatality rates.

Research in several countries shows that, 90 percent of all road traffic accident are caused by human error and only a small portion's caused by vehicle defect, poor road design and inadequate maintenance and also driver impairment is the most crucial component of road traffic accident worldwide.[5] According to official statistics 141,526 persons were killed and 477,731 injured in road traffic crashes in India in 2014 (NCRB, 2015). However, this is probably an underestimate, as not all injuries are reported to the police.[6,7]

The situation in India is worsening and road traffic injuries (RTI) have been increasing over the past twenty years .This may be partly due to the increase in number of vehicles on the road but mainly due to the absence of coordinated evidence-based policy to control the

problem. 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. Though the motor vehicle fatalities are higher on highways than in urban areas, as would be expected, the differences are not as high as in western countries. Compared to these studies our study results shows involvement of rural population is more (73.3%) and pedestrian is less (5.6%), this may be because of increase in the vehicle population in urban area and road users are less as now a days people are dependent on vehicle even for a travelling to short distance, and improvement in economic status of people compared to older days leads to purchasing of more vehicle. According to road safety data from transportation research and injury prevention programme (TRIPP) by Indian Institute of Technology Delhi in collaboration with WHO by Dinesh Mohan, Geetam Tiwari and Kavi Bhalla shows that vehicle population is increased to 140000 in 2015 from 20000 in 1970.

Saija KK and Patel CD (2002) and Shrinivas, PLL (2004) analysed road traffic crash data obtained from the police records for the state of Gujarat and Tamil Nadu respectively at a macro level but considered national highway data in combination with other roads.[8,9] Kumar RP et al. have done a study of crashes on Palani D section of NH 209 and report that about 50% of the crashes involved buses and 25% of the victims were pedestrians and that two stretches of the highway had a higher number of crashes than other section.[10,11] In contrast to these studies, our study results shows that high involvement of rural location (73.3%) rather than other location and two wheelers are more involved (74.9%) in this study rather than pedestrians (5.6%) and heavy vehicle victims(13.3%).

Shaheem S. et al have published two detailed studies on road traffic crashes on the national highway in Kerala.[12] They report that heavy vehicles had a high involvement and pedestrians and cyclists were 28% of the victims. In contrast to these studies data from our study reflects RTA in rural area rather than highway, and high involvement in two wheelers (74.9%), followed by four wheelers (13.3%), this could be pedestrians involvement is less, which could be because two wheeler vehicle populations is more in rural area of Karnataka, pedestrians will be less now a days due to increased dependency on vehicles.

CONCLUSION

Prevalence of road traffic accidents are high among children of age group between 15 -18 years (31.8%) and high involvement with passengers of two wheelers (74.9%) in rural populations (73.3%). The contributing factors for these prevalence could be road conditions in Indian rural areas, less knowledge and negligence in following traffic rules, carrying children in front part of vehicles is more common in rural India. Road traffic accidents and their consequences are a significant burden to all societies in developed and developing counties. Interventions should be planned for particular situations and need to be appropriate for country specific. In general human error is the most common cause of all RTA.

The present study observed that most of road injury fatalities in children involved males in the age group of 15-18 years, most commonly affected were travellers in two wheelers and none of them died, but none of the victims wear helmet. The rural population was most commonly involved. To bring the mortality rate down, children, especially with rural background should be made aware about the importance of strict compliance to traffic rules and regulations. One of the best ways to do it is to include road safety issues in school curriculum, educating the public at gram panchayat level, and government need to start educating public and to create awareness among rural people at village level. Compulsion on wearing helmet for two wheelers is most welcome step by government, it need to extend to paediatric age group so that can prevent mortality and morbidity in children. Road traffic accident were the most common and most neglected non-infectious cause of morbidity and mortality in children. India despite having the distinction of being the second most populous country contributed only 0.7% articles on road traffic injuries, with this aspect more number of studies need to be conduct on RTAs we need to focus on this .

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