A Retrospective study on Non Fatal Motor Vehicle Accident cases in the Emergency Department, Saveetha Medical College, Chennai

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Abstract

Aim & Objectives: To retrospectively study non fatal RTAs in the emergency department of SMCH with help of AR registers while studying various factors involving like pattern, site and time of injuries and age of the person involved.

Materials and Methodology: Data was collected for complete one year and all the cases in the year were included in the study, which thus constitute sample for the study. The retrospective study group consisted of all the RTA victims reporting to Emergency Department of SMCH in the study period from 1st January 2018 to 31st December 2018. These collected data were compiled with help of Excel.

Results: In this study a total of 911 cases were included who were admitted in the emergency department of SMCH. Males were the most commonly involved. Around 95% of the cases involved 2 wheelers. 65% of the accidents took place in the 6pm to 9pm range. Commonly involved age group is 18-30. 20% showed head injuries but the majority had injured their limbs.

Conclusion: This suggests that there has to be more awareness created amongst the youth population encouraging them to wear helmets and seat belts. More advancement is required in the field of automotive safety. Road safety must be embedded in the children's curriculum from lower grade itself. More involvement of Traffic police, NGOs and other public awareness groups are required to enforce this.

Keywords: *Accidents, Awareness, Non-fatal injury, Trauma*

Introduction

A **road traffic accident** (RTA) is any injury due to crashes originating from, terminating with or involving a vehicle partially or fully on a public road. It is predicted that road traffic injuries will move up to the 3rd place by the year 2020 among leading causes of the global disease burden. An accident is not just 1 bad event; it's the combination of a series of mechanical failures and a very bad luck.

Road traffic injuries are the 8th leading cause of death globally and sadly is also more prevalent in the most important age group that is needed for the growth of a country which is 15–29 years. WHO report says more than a million people die each year on the world's roads and the cost of dealing with these consequences of these incidents runs to crores of rupees. Current trends suggest that by 2030 road traffic deaths will become the fifth leading cause of death (from 8th position) unless urgent action is taken.

Accidents are just not because of incompetence, but are due to carelessness, thoughtlessness and over confidence. The morbidity is particularly high in India is mainly because of our rapidly motorizing economy with poor or under developed roads with lack of proper road infrastructures and other safety needs on roads. The rules also play an important role as they don't strictly enforce the rider to wear a helmet. When this is viewed from a better angle, it causes an economic problem nation wise, especially in developing and underdeveloped countries.

Most of us know the facts that, you're most likely to die on the way to the airport than while you're flying in an airplane. This means that car accidents are more incidental than air crash. 2008 Traffic Safety Facts Data says there are 1.27 fatalities per 100 million vehicle miles traveled. While the same report works out to nearly zero accidents per million flying miles. According to the aviation report, most of the mid air emergencies have been safely handled and no one died[1]. In actuality, driving is more dangerous, with more than 5 million accidents. Whereas there has been only 15 accidents on average per year. 2017 was the safest year with only 10 accidents throughout and only 44 lives were lost. This fact is true because of the volume of cars in the world when compared to airliners. All these facts show us that air travel is much safer. The odds of death in a car accident are to be 1 in 98 for a lifetime.

In 2004, the World Health Organization (WHO) and the World Bank launched the World report on road traffic injury prevention. It also aims to monitor the whole decade and to give suggestions on how to improve road safety[2]. In spite of all these efforts there has been no overall reduction in the number of people killed on the world's roads: about 1.24 million deaths occur annually. But since there's been a corresponding 15% global increase in the sales of number of registered vehicles, suggesting that interventions to improve global road safety have failed to account for this fact. And therefore there is still rise in RTA deaths except in about 8 developed countries which has successfully decreased their RTA mortality rates.

This lack of attention to road safety issues further adds to the load of problems of road traffic injuries and need public health concerns. Thus reducing the epidemic of accidents. This study was planned to understand the major causes/risk factors as well as nature, type and mode of occurrence of road traffic accidents in and around the areas of our hospital Saveetha Medical College, Thandalam, Chennai.

Materials and Methodology

This is a retrospective study. The study was conducted using AR (Accident Registers) logs available at the department of medical records, Saveetha Medical College, Thandalam, Chennai. The study period was from January 1st, 2018 to December 31st, 2018. A total of 911 cases were reported during this period. All of these cases were taken into the study. I took six factors for the analysis of the study. These are as follows;

Age (person admitted)

Sex (person admitted)

Mode of transport involved (both parties)

Time of accident

Site of Injury

Pattern of Injury

All these data were collected from the AR log books manually. It was then compiled with the help of Microsoft Excel (2007). These compiled data was then analyzed using SPSS software. All the frequencies and percentages were also obtained from this.

One important factor that was not included in this study is the cause of the accident which includes drunken driving, sleeping while driving or of exhaustion.

The minimum that was recorded in my study was 8 years and maximum was 69 years. So the age groups were split into groups of 15 years each. For example, 0-14 years and 15-29 years and so on. This makes it easier to study which age group is more affected and which is less affected.

Mode of transport involved were 2 wheelers, 4 wheelers, HMVs like lorry, 3 wheelers like auto rickshaws and pedestrians. The whole 24 hours of the day were split into a 3 hour segment. So there are 8 segments. Segment I is from 0000 hours to 0300 hours, Segment II is from 0301 to 0600 hours so on and so forth.

For the study of site of injury, I had split upper limb injuries into two (proximal and distal) and lower limb injuries into two (proximal and distal). Proximal in upper limbs are above the level of the elbow and distal means elbow and below level. In lower limbs proximal is above the level knee and distal means knee and below level. Trunk includes abdomen, thorax and back.

Results

In this study, all cases of poly traumatic injuries as well as simple trauma injuries. Multiple trauma is 55% of cases and 45% of cases came with simple traumatic injuries. It implies the presence of two or more separate injuries, at least one or a combination of which endangers the patient's life[3].

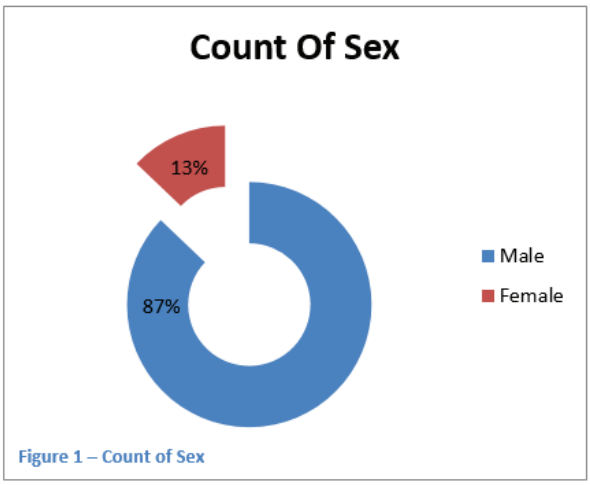


Figure 1 – Count of Sex

There were a total of 911 cases noted. Out of these victims who came to the ER, 87% of them were males and 13% were females.

However this couldn't be because of the population distribution of Tamil Nadu, as it is 955 females per 1000 males according to the 2011 census[4].

The most commonly involved age group was 15-29 years[5]. This category contains the bunch of teenagers and young adults. Main reasons behind these accidents are carelessness, thoughtless driving and experimental stunting. This accounts to about 62.8% of the total accidents recorded. It amounts to 572 cases. Next highest category is the 30-44 years which accounts to about 21% which is 187 cases. Only 19 accidents involved children less than 14 years of age and 29 accidents were involved by senior citizens.

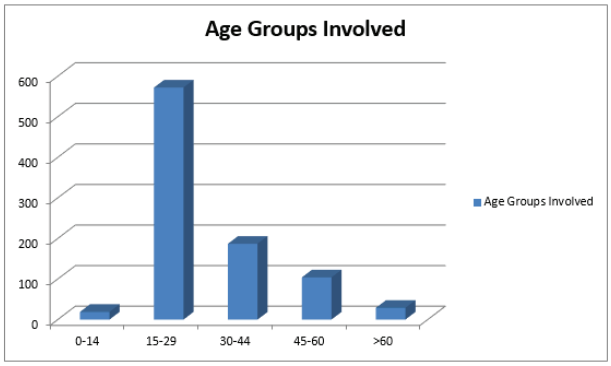


Figure 2 – Age Groups Involved

Traffic is of peak during 6pm to 9pm around Thandalam region. Therefore the accidents are also more during this time. 250 accidents were recorded during these hours. Second most highest is recorded in 9pm-12am part with 150 cases. Although we might tend to think that early morning accidents should be more common, these trends were not seen in my study. This peak hour accidents could also be because of social factors like the mindset of the person who are returning home from office after a stressful day. Distractions also play a role. People using phones whilst driving, their spatial processing is reduced by 37%.

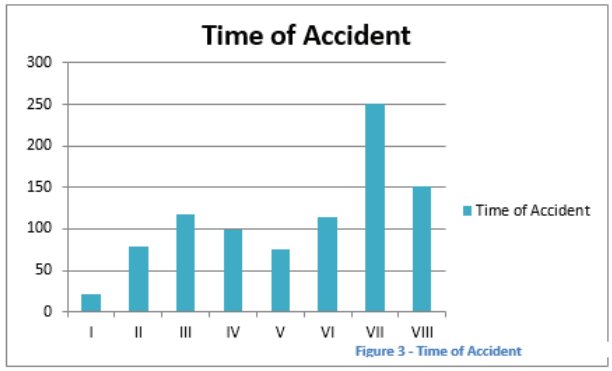


Figure 3 - Time of Accident

The number of 2 wheelers in urban areas like this significantly high, and so they are the most involved[6] .The sales of 2 wheelers in India reached 20 million mark in 2018, which was double the number sold in 2010 which was at 11.24 million. This boom is very much evident in this study too as the two wheelers involved were 93.4% of total cases i.e. nearly 850 cases of 911 accidents[7]. Less than 1% involved pedestrians.

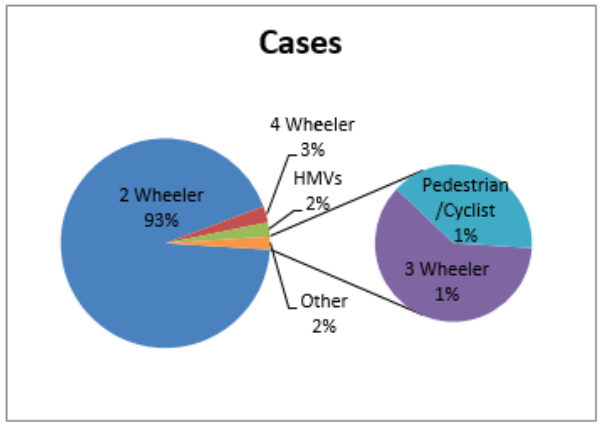
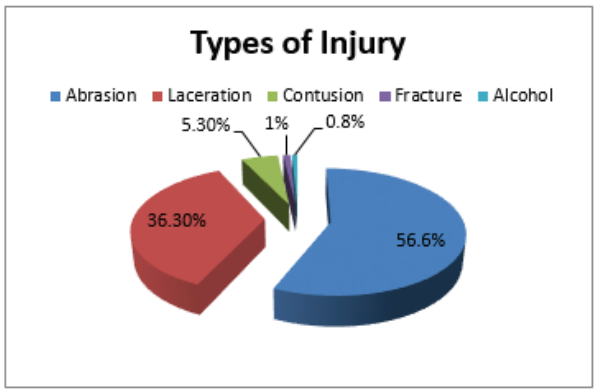


Figure 4 – Mode of Transport Involved

Most of the injuries were of abrasion type[8]. Abrasion is defined by an injury of destruction of the skin, which involves only the superficial layers of the epidermis and also doesn't involve the whole thickness of skin[9]. Number of cases which had abrasion type injury is 516 cases. This is the most common type of injury, as the study takes in cases only about non-fatal road traffic accidents. Abrasion is just mild. Others like laceration or contusion or even fracture can be fatal. Next commonest is laceration type with 36.3% of total cases.

This amounts to about 331. Followed by contusion and fracture at 5.3% and 1% respectively.



Data analysis is conclusive that most commonly injured sites are the distal parts of the lower limbs. This accounts to about 24.8%. All of the injuries were within close reaches of this value, that is, all of the bodies were injured equally. Next closest is Distal upper limbs at 23.4% followed by proximal upper limbs at 22.6%. Proximal lower limbs were at 20%. Unlike other case studies, head injuries involved in my study were surprisingly less. But this can be explained by the fact that this being a non-fatality study, prevalence of head injuries was low at a staggering 9%.

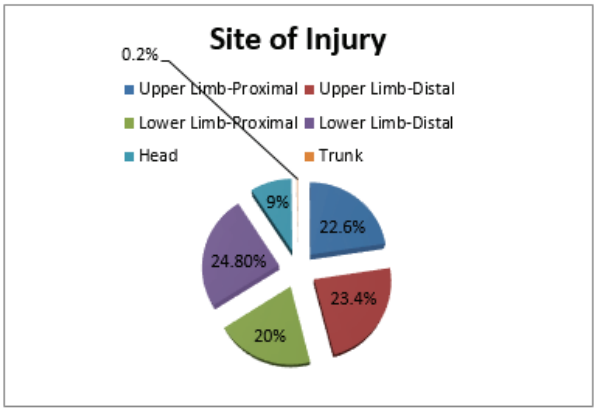


Figure 6 - Site of Injury

Discussion

Age seems to be one of the major factors. Teens with their bodies fully pumped with hormones make them indulge in various dangerous activities like speeding, not following traffic lights and entering wrong ways. But this just a small factor among the major ones. The main factor is the rapid urbanization of our cities, this trend is seen worldwide but in India it is even more as it's a developing country. Bike population is this country is second in the world after China which has 22.4 million bike sales in 2015, while India had 20.7 million 2 wheelers in 2018.

This rapid urbanization side by side with motorization must be addressed. But this can't be stopped until we control the population explosion. All we can do is to prevent these accidents from happening. Encouragement of use of public transport can reduce this significantly. Doing this has double benefits: First of all it reduces accidents and number of vehicles on the road, and secondly it reduces the carbon footprints of all of us. But many of Indian population look down upon or refuse the use of public transport due to various reasons like to avoid the crowd and for reasons of hygenicity. So, in order to counteract this, the transport department must increase the frequency and number of buses or rails and ensure proper hygiene techniques are used.

From the school level itself we must create awareness among the children and teach them about the consequences. If bikes are the preferred transport, then proper driving equipment should be used. From wearing helmets to wearing gloves. To protect injuries to spine we have spine guards too. But for at least an average protection wearing of seat belts and helmets is to be made mandatory. Road safety measures are very simple solutions to these complex problems. There should be good road lighting and segregation of slow moving vehicles from fast moving vehicles, pedestrians safety in highways by use of Zebra crossing and sub ways for pedestrians[10]. They can add proper signs along the sides of the road to warn the drivers[11]. Nowadays there's AI mediated driving technology growing.

Peak hour traffic can be managed by better road laying techniques and maintaining proper conditions of signals. In this study we found that 6pm to 9pm the accidents were the highest. This because of the traffic in the Thandalam area during that time. Strict implementation of rules by the court of law is much needed.

Last of all and most important change we have to bring in is the medical support. In case of an accident, ambulances must reach the site within a very short time and extensive training for paramedical staff is also one of the cornerstones to provide the first aid needed in the field. Better equipped ER with advanced trauma care must be in use.

Conclusions

This study was conducted in Saveetha Medical College, Thandalam, Chennai. Total of 911 cases were studied retrospectively about the non-fatal road traffic accidents that came to the emergency department during January 1st, 2018 to December 31st, 2018. Road vehicles have no respect for the human anatomical boundaries. They occur to people irrespective of age, sex, caste or religion.

The most involved age group was from 15-29 years. 87% were male. 55% had multiple injuries. Knees, legs and feet were the most injured parts with 56% of them had abraded type of injury. What we need is bee hive coordination between doctors, engineers and government to tackle this problem and not some pinnacle of technology to save us.

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Ethical Clearance: Obtained from institutional ethical clearance bar

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