



Prevalence of head injuries in patients undergone road traffic accidents in West Bengal

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Abstract

Road accidents have earned India a dubious distinction. With over 130,000 deaths annually, the country has overtaken China and now has the worst road traffic accident rate worldwide. Injuries due to RTA depend upon a number of factors such as human errors, driver fatigue, poor traffic sense, poor road condition, mechanical fault of vehicle, violation of traffic rules, traffic congestion, and road encroachment etc^[2]. Head injuries following the road traffic crashes (RTCs) are the most common cause of morbidity and mortality in most developed and developing countries and may also result in temporary or permanent disability or ultimately death of the victim. Based on above findings the present study was planned to study the Prevalence of Head Injuries in Patients Undergone Road Traffic Accidents in West Bengal.

The present study was planned in Department of Forensic Medicine, Sri Ram Krishna Institute of Medical Sciences, Durgapur, West Bengal from Dec 2018 to Aug 2019. Total 50 cases of the road accidents with head injuries admitted to our hospital were evaluated in the present study. Every eligible patient present in ward or casualty on the scheduled day was interviewed. Information of patient admitted to casualty was taken from casualty register while that of patient admitted to ward, information was taken from ward admission register. After screening of eligible patients they were contacted either in ward or casualty. They were told the purpose of the study and were invited to participate in the same.

Road traffic accidents with head injuries are much more common in young working males as compared to females and that to in those who were pedestrians and motor cyclists. The rate of incidence is higher in India because of bad traffic patterns and possibly the lack of awareness about traffic rules and also lack of good hospital services to our victims of RTAs. Road traffic accidents are an unfortunate economic burden on developing countries like India. Head injury due to RTA is a recognized public health problem causing death and disability. It is required from concerned government authority to take appropriate and immediate measures for reducing the incidence of head injury. At the same time, people should be educated for taking good preventive actions to avoid head injury.

Keywords: head injury, intracranial haemorrhages, road traffic accidents, skull fractures

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 projected that road traffic injuries will move up to the third position by the year 2020 among leading causes of the global disease burden. They are considerable economic losses to victims, their families, and to countries as a whole. The Global status report on road safety 2013 indicates that worldwide the total number of road traffic deaths remain unacceptably high at 1.24 million per year. Road traffic injuries are the leading cause of death among young people, aged 15–29 years. Children, pedestrians, cyclists and older people are among the most vulnerable of road users constituting half of those dying on the world's roads. Majority of the world's fatalities on the roads occur in low-income and middle-income countries, even though these countries have approximately half of the world's vehicles. India is no exception and data showed that more than 1.3 lakh people died on Indian roads, giving India the dubious honour of topping the global list of fatalities from road crashes. Rapid urbanization, motorization, lack of appropriate road engineering, poor awareness levels, nonexistent injury prevention programmes, and poor enforcement of traffic laws has exacerbated the situation.

Rather than mechanical, its human factor that contribute significantly to increasing number of road accidents in

India. Drunken driving, over speeding, refusal to follow traffic rules, and reckless driving are main reasons for road accidents. Drunken driving is one of the major causes of road traffic accidents especially among commercial vehicle drivers on highways. Data shows drunken driving to be responsible for 70% of road fatalities in Delhi and Mumbai. The risk of being involved in a crash increases significantly above a blood alcohol concentration (BAC) of 0.04 g/dl. Over speeding increases the probability of fatal injuries for car occupants from near zero to almost 100% as the change of speed during the impact increases from 20 kilometers per hour to 100 kilometers per hour. Pedestrians have a 90% chance of surviving car crashes at 30 kilometers per hour or below, but a less than 50% chance of surviving impacts at 45 kilometers per hour or above.

Reckless driving like use of mobile phones during driving, non-use of helmets, non-use of seat-belts are significant contributing factors for road traffic accidents and should be avoided. Driver fatigue and sleepiness also contribute to crashes. Improper designing of roads and lack of pedestrian pavement are other contributing factors. Only 28 countries have comprehensive road safety laws on major key risk factors like drunken driving, speeding, and failing to use helmets, seat-belts, and child restraints. This is a major cause of concern and both society and government should work together to reduce this preventable cause of death.

Helmets for two-wheeler riders: Setting and enforcing

mandatory helmet use is an effective intervention for reducing injuries and fatalities among two-wheeler users. Wearing a helmet decreases the risk and severity of injuries by about 72% and likelihood of death by 39% as per WHO road safety manual on use of helmets.

Seat-belts and child restraints: It should be mandatory to wear seatbelts both for the front and rear occupants of the car. Wearing a seat-belt reduces the risk of a fatality among front-seat passengers by 40–50% and of rear-seat passengers by between 25–75%. Children of any age should not be seated in the front seat and should have child restraints. The latter is also effective in reducing injuries that can occur during non-crash events, such as a sudden stop, a swerving evasive manoeuvre or a door opening during vehicle movement.

Setting and enforcing speed limits: Pedestrians have a 90% chance of survival if hit by a car travelling at a speed of 30km/h or below, but less than a 50% chance of surviving an impact of 45km/h or above. Speed-monitoring cameras and radars and speed-limiting governors in vehicles are useful devices in enforcing the speed limit.

Setting and enforcing alcohol limits: Drinking and driving is one of the main causes of road crashes worldwide. Laws that establish blood alcohol concentration (BAC) of 0.05g/dl or below are effective at reducing the number of alcohol-related crashes.

Banning drivers from using hand-held mobile phones: Drivers using a mobile phone are approximately four times more likely to be involved in a crash than when a driver does not use a phone.

Road Safety: The central and the state governments have been implementing measures to make our roads safer. But the magnitude and gravity of the problem is such that these alone will not suffice. There is a need for the society at large to take cognizance of the issue and to join hands to make road safety a social movement. To give all the stakeholders an opportunity to take part in concerted action for the cause, "Road Safety Week" is observed throughout the country every year in the month of January. The theme of Road Safety Week in the year 2014 was "When on the road, always say, "Pehle Aap". The theme of Road Safety Week for 2015 is "Build a safety culture for sustainable supply chain" The link of National Road Safety Policy is given below.

Road Safety and Transport Bill, 2014: The Government has proposed a new Road Safety and Transport Bill, 2014, making the penalties more stringent, with an obvious aim to curb traffic violations. Its vision is to provide a framework for safer, faster, cost effective and inclusive movement of passengers and freight in the country. A draft for the proposed new Act to replace the existing road safety legislative framework is placed on the official website of the Ministry of Road Transport and Highways seeking feedback from the public and stakeholders.

The term "golden hour" is commonly used to characterize the urgent need for the care of trauma patients. This term implies that morbidity and mortality are affected if care is not instituted within the first hour after injury. If proper first aid is given, road accident victims have a greater chance of survival and a reduction in the severity of their injuries.

There is a relative ignorance on part of public to come forward to help the road crash victims, for the apparent fear that they might be involved in police case. The Hon'ble Supreme Court in the case of Pt. Parmanand Katara vs.

Union of India has also stressed that the victims of road crashes need to be provided medical aid in the first instance and thereafter, the procedural laws could operate.

"Every injured citizen brought for medical treatment should instantaneously be given medical aid to preserve life and thereafter the procedural criminal law should be allowed to operate in order to avoid negligent death. There is no legal impediment for a medical professional when he is called upon or requested to attend to an injured person needing his medical assistance immediately. The effort to save the person should be the top priority not only of the medical professional but even of the police or any other citizen who happens to be connected with that matter or who happens to notice such an incident or a situation. "There are no provisions in the Indian Penal Code, Criminal Procedure Code, Motor Vehicles Act, which prevents doctors from promptly attending to serious injured persons and accident cases before arrival of the police and their taking into cognizance of such cases, preparation of F.I.R. and other formalities by Police."

Following the Supreme Court order in 1989, the Motor Vehicles Act was amended in 1994, to make it mandatory on both the driver/owner of the vehicle to take the accident victim to the nearest doctor, and the doctor to treat the victim without waiting for any formalities. This makes the duty of the driver mandatory by law and failure to comply is punishable under Section 187 of the Motor Vehicles Act 1988.

Every doctor whether at a Government hospital or otherwise has the professional obligation to extend his services with due expertise for protecting life. No law or State action can intervene to avoid / delay the discharge of the paramount obligation cast upon members of the medical profession. The obligation being total, absolute and paramount, laws of procedure whether in statutes or otherwise which would interfere with the discharge of this obligation cannot be sustained and must, therefore, give way. The treatment of the patient should not wait for the arrival of the police or completion of legal formalities. All hospitals and doctors are required to provide immediate medical aid to all the cases, whether medico-legal or not.

Police authorities in Delhi have instructed that the members of the public, who rendered voluntary help to persons injured in accidents, should not unnecessarily be questioned and detained at police stations. Those who bring accident victims to hospitals are to be treated with utmost courtesy and should not be harassed in any way. Even if they are unwilling to give their particulars, the same should not be insisted upon. Delhi Administration circular also instructs that the local police should pay the transportation expenses (upto Rs 100) to the public man who brings the victim to the hospital. Government of India has instructed all the Director General of Police of all States/UT to follow action on Delhi Police lines ^[1].

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and may also result in temporary or permanent disability or ultimately death of the victim. Based on above findings the present study was planned to study the Prevalence of Head Injuries in Patients Undergone Road Traffic Accidents in West Bengal.

Methodology

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All the patients were informed consents. The aim and the objective of the present study were conveyed to them. Approval of the institutional ethical committee was taken prior to conduct of this study.

Following was the inclusion and exclusion criteria for the present study.

Inclusion criteria: All patients of RTAs with head injury in age-group 20 – 60 years who have admitted in casualty and admitted to Hospital.

Exclusion criteria: The patients not giving consent to be a part of study, patients who were immediately referred to higher centre, patients who were brought dead and those below 20 years and above 60 years of age.

Results & Discussion

India is a developing country where poverty and unemployment pushes people towards urbanized cities. This rapid and unplanned urbanization associated with incompetent traffic system, unplanned roads and highways, violation of traffic rules by drivers and pedestrians, overcrowding of people and vehicles, unlicensed rickshaws, reckless driving, etc. are responsible for highest rate of road traffic accidents [3].

Nowadays, the increasing modernization of road traffic, a hike in road traffic accidents (RTAs), becomes exponentially more frequent and serious. Indeed, according to the World Health Organization’s (WHO) predictions, in 2030, traffic accidents will be the leading cause of morbidity and mortality of young people worldwide [4]. This morbi-mortality is largely related to the frequency and severity of the brain lesions caused by this type of accidents. Brain trauma is considered to be the leading cause of death following a traffic accident. On the other hand, the majority of epidemiological studies on head trauma are not exclusively devoted to traffic accident-related head trauma, since they often include other mechanisms, as well (falls, aggressions, etc.).

Table 1: Age & No. of Cases

Age	No. of Cases
20 – 30 years	12
31 – 40 years	20
41 – 50 years	11
51 – 60 years	7
Total	50
Sex	
Males	35
Females	15
Total	50

Table 2: Type of injury

Type of injury	No. of cases
Head injury	8
Head, neck, face injuries	16
Head + other body injuries	26
Total	50

Table 3: Fracture of vault

Fracture of vault	No. of Cases
None	5
Fissured of vault	13
Fissure of base	2
Depressed	3
Comminuted	3
Fissured + depressed	4
Fissured # of vault and base	8
Fissured + depressed + comminuted	2
Depressed + comminuted	1
Crush	7
Craniotomy/ burr holes/ drain/ other surgical procedures	2
Total	50

Among head injury, the most common cause was road traffic accidents followed by fall from height. Similar findings are seen in studies done by Chen CL *et al* which showed 70% road traffic accidents, 15.3% fall from height and assault in 8.7% cases [5]. Results of Kumar L *et al* and Kremer C *et al* do agree on the same [6-7].

In the developing world, RTAs account for a majority of maxillofacial trauma [8-11]; the introduction of seat belts and improvements in car design have greatly decreased the incidence of fatalities and RTA-associated maxillofacial trauma [12]. The most important factor in determining the extent of injury which patients sustain in RTAs is the direction of the collision. Drivers involved in head-on collision have an 18% increase in survival [12]. Like seat belts, the airbag has proven to be effective in reducing injury and fatalities in motor vehicle accidents. Airbags work best when combined with a belted driver, reducing fatalities by more than 50%. In an unbelted driver, airbags reduce fatalities by up to one-third and the decrease in facial injuries due to the prevention of direct facial impact onto the steering wheel, dashboard, or seat [13-14]. Despite the incontrovertible evidence, it is alarming to note that a large number of car occupants and motorcyclists involved in

RTAs failed to wear either safety belts or crash helmets. These findings may be partially explained by the association of injuries with alcohol and/or drugs. The other factor that significantly affects the severity of injury is the speed at which an accident occurs. Because of the concept of applied force/kinetic energy ($K = 1/2 MV^2$), even small increase in speed results in disproportionate intensification of injury. The converse is inevitably true: small reductions in speed reduce the seriousness of the injuries sustained^[15-16].

Similar observations were reported in studies from Iran and USA^[17]. Out of 90 head injury cases, most commonly found intracranial haemorrhage was extradural haemorrhage (42%) which is consistent with other studies^[18-19]. No significant variation was evident in the incidence of fatal vehicular accidents by days of a week in our study. This pattern differs from earlier study conducted in Delhi according to which highest numbers of accidents were on Saturdays^[19]. In study of Wanger AK *et al*, they reported approximately one third of patients with moderate head injury and half of patients with severe head injury were operated, most of them being for cerebral contusions and/or subdural hematomas^[20]. Mortality following head injury has been reported to be in the range of 39-51%^[21].

Hence it is believe that there is an urgent need to sensitize the general public and police about the transportation and pre-hospital management of such severe head injury patients. Our peripheral hospitals need to be well equipped for treatment of such patients. Treatment of such unknown patients can entail a huge expenditure and therefore, every hospital should allocate funds for the above purpose and only those patients who are in need of higher medical care should be referred to higher centre.

Conclusion

Road traffic accidents with head injuries are much more common in young working males as compared to females and that to in those who were pedestrians and motor cyclists. The rate of incidence is higher in India because of bad traffic patterns and possibly the lack of awareness about traffic rules and also lack of good hospital services to our victims of RTAs. Road traffic accidents are an unfortunate economic burden on developing countries like India. Head injury due to RTA is a recognized public health problem causing death and disability. It is required from concerned government authority to take appropriate and immediate measures for reducing the incidence of head injury. At the same time, people should be educated for taking good preventive actions to avoid head injury.

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