pISSN 2394-6032 | eISSN 2394-6040

Original Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20164707

Road traffic accidents with head injury: delay in treatment and socioeconomic and legal impact

Urfi¹*, Ali Amir¹, Salman Khalil¹, Mohd F. Hoda²

¹Department of Community Medicine, ²Department of Neurosurgery, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

Received: 10 November 2016 **Revised:** 28 November 2016 **Accepted:** 06 December 2016

*Correspondence:

Dr. Urfi,

E-mail: urfiislam@yahoo.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Road traffic accidents (RTAs) with the head injury warrants early treatment. The delay in receiving the specialized care adversely affects the outcome. Economic losses due to RTA with the Head Injury amount of Rs 550 crores (12.5 billion dollars), an amount that equals our defense budget. Insurance of vehicles and victims and compensation claims are related legal issues. The Objectives of the study were: 1. To analyze the delay in reaching the hospital following the Road Traffic Accident with Head Injury. 2. To study the pattern of pre-hospital treatment received. 3. To measure the socioeconomic and legal impact of Road Traffic Accident cases with Head Injury.

Methods: A hospital based cross-sectional study was conducted in casualty and allied departments of Jawaharlal Nehru Medical College and Hospital, Aligarh. All cases of RTA with Head Injury admitted from August 2010 to July 2011 who were 15-45 years of age were included in the study using purposive sampling. Data was analyzed with SPSS 20.

Results: A total of 463 patients were included in the study. Almost two-third of patients i.e. 315 (68.0%) were brought to hospital within 6 hours and the remaining 148 (32.0%) reached hospital after lapse of 6 or more hours. Of all patients who reached hospital before 6 hours, only 70 males and 10 females received some form of pre-hospital treatment. The mean expenditure during hospital stay was Rs.3663.71. About 51.6% of patients had to stay for 1-3 days in hospital following a head injury. As many as three-fourth of vehicles involved in accident were insured while just 14.3% of patients were insured. Only 5 (1.1%) out of the 463 patients applied for compensation till the time of interview.

Conclusions: Reaching hospital early has direct bearing on final outcome of accidents. RTAs with Head Injury lead to variable out-of-pocket expenditure for patients and their attendants. Majority of victims do not have insurance, though insurance of vehicles is a common practice.

Keywords: Head injury, Insurance, Pre-hospital treatment, Purposive sampling, Road traffic accident

INTRODUCTION

Transportation is increasing day by day. This increase is also associated with the rise in Road Traffic Accidents (RTAs) and premature deaths, as well as physical and psychological handicaps.¹ RTA is an important

determinant of head injury. Head Injury following RTA warrants early treatment. The delay in receiving the specialized care adversely affects the outcome of RTA. A positive linear as well as logarithmic trend has been observed with delay in admission to the hospital and severity of outcome.² Equally significant are the rising costs of health services and the added burden on public

finances. Low-income and middle-income countries account for 91.8% of the DALYs lost due to RTAs worldwide. Economic losses due to RTAs with the head injury amount to Rs 550 crores (12.5 billion dollars), an amount that equals our defense budget. Insurance is another important aspect in lowering the cost of RTA. Insurance of vehicles as well as of occupants is important. The present study was planned to explore the socio-economic and legal impact of RTAs with head injury with the following objectives: 1. To analyze the delay in reaching the hospital following the RTA with head injury. 2. To study the pattern of pre-hospital treatment received. 3. To measure the socioeconomic and legal impact of RTA cases with head injury.

METHODS

A hospital based cross-sectional study was conducted in casualty and allied departments of Jawaharlal Nehru Medical College and Hospital, Aligarh. Study subjects included all patients of RTAs with head injury in agegroup 15-45 years who were admitted to Jawaharlal Nehru Medical College Hospital between August 2010 and July 2011. Purposive sampling was used to include the subjects. The subjects who did not give consent to be a part of study or were immediately referred to higher centre or brought dead were excluded from the study. A total of 463 patients were included in the study. The following operational definition of Road Traffic Accident was used: A collision involving at least one vehicle in motion on a public or private road that results in at least one person being injured or killed.^{5,6} Before discharge patient's neurological status was assessed as per Glasgow

Coma Scale (GCS) to classify the patient into recovered completely and recovered with some deficit. Recovered completely was defined as having GCS score of 13-15 at the time of discharge while recovered with some deficit as having GCS score of 12 and below. Other outcomes considered were died, referred to higher centre during course of hospital treatment and left against medical advice. Data was analyzed with SPSS 20. Chi-square was used to assess the relationship of outcome with time to reach hospital and duration of hospital stay.

RESULTS

A total of 463 patients were included in the study. 376 (81.2%) were males and 87 (18.8%) were females. 315 (68.0%) patients were brought to hospital within 6 hours and the remaining 148 (32.0%) after lapse of 6 or more hours (Figure 1).

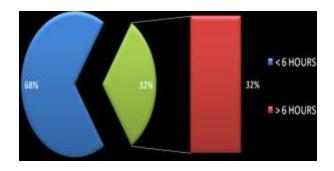


Figure 1: Distribution of patients according to time to reach hospital.

	Time to reach hospital					
Treatment	< 6 Hours		>6 Hours	>6 Hours		
	Male	Female	Male	Female	— Total	
A. Treatment received						
Yes	70 (18.6%)	10 (11.5%)	94 (25.0%)	28 (32.2%)	202	
No	190 (50.5%)	45 (51.7%)	22 (5.9%)	4 (4.6%)	261	
Total (n=463)	260 (69.1%)	55 (63.2%)	116 (30.9%)	32 (36.8%)	463	
B. Type of treatment						
First aid	66 (40.2%)	9 (23.7%)	75 (45.7%)	24 (63.2%)	174	
Medical/surgical	1 (0.6%)	1 (2.6%)	3 (1.8%)	0 (0%)	5	
First aid + medical/surgical	3 (1.8%)	0 (0%)	16 (9.8%)	4 (10.5%)	23	
Total (n=202)	70 (42.7%)	10 (26.3%)	94 (57.3%)	28 (73.7%)	202	

Table 1: Pattern of prehospital treatment received.

None of the patient received treatment at the site of an accident or on the way to hospital. Most of the patients who received one or other form of treatment went to either some health center or private clinic before reporting to this hospital. Out of 260 (69.1%) males and 55 (63.2%) females who got to the hospital before 6

hours, 70 males and 10 females received some sort of pre-hospital treatment. On the other hand, among 116 (30.9%) males who reached the hospital beyond 6 hours, 94 received some form of pre-hospital treatment. The patients who experienced some sort of treatment prior to admission were more among the ones reporting late to the

infirmary. The overall number of patients who received treatment was 202 (43.6%) (Table 1).

The expenditure which either the patient or his/her attendants had to endure during the hospital stay till the fourth dimension of the interview was also noted to nearest rupee (Table 2). Minimum expense noted was Rs.200 while the maximum noted was Rs.25, 000. Majority 268 (57.9%) of patients had to expend between 2000 and 3999. Apart from out of pocket expenditure socioeconomic and legal impact was also assessed in terms of duration of hospital stay, presence of insurance and outcome of the fortuity.

Table 2: Distribution of out of pocket expenditure.

Amount spent in Rs.	N	%	
≤2000	33	7.1	
2000- ≤3999	268	57.9	
4000- ≤5999	122	26.3	
6000- ≤7999	20	4.3	
8000 and above	20	4.3	
Total	463	100.0	

Just above half 239 (51.6%) of patients stayed for 1-3 days in hospital followed by 4-7 days stay in 178 (38.4%) patients (Table 3). Only 66 (14.3%) of patients had insurance of which 57 were males and 9 were females. Remaining 397 (85.7%) had no indemnity. On the other hand 293 (77.5%) of total vehicles involved in accidents were insured of which 235 belonged to male patients and 58 vehicles belonged to female patients. However, only 5 (1.1%) out of the 463 patients interviewed has applied for compensation till the fourth dimension of the interview, though many more may have applied for compensation later on being released from hospital. 69 (14.9%) of patients recovered with some deficit. 18 (3.9%) of the patients dropped dead as the result of an accident and 6 (1.3%) were conveyed up to the higher center for further management.

The time lag in making the hospital beyond 6 hours bore a substantial relationship with the severity of outcome of RTAs (p-value=0.001). Also as the duration of hospital stay increased, the outcome became worse (p-value<0.001).

Table 3: Socio-economic and legal impact.

	Gender	Cender			
	Male	Female	Total		
	N (%)	N (%)	N (%)		
Duration of hospitalization (Days)	, , ,	,			
1-3	197 (42.5%)	42 (9.1%)	239 (51.6%)		
4-7	143 (30.9%)	35 (7.6%)	178 (38.4%)		
>7	36 (7.8%)	10 (2.2%)	46 (9.9%)		
Total	376 (81.2%)	87 (18.8%)	463 (100.0%)		
Insurance					
Is victim insured					
Yes	57 (12.3%)	9 (1.9%)	66 (14.3%)		
No	319 (68.9%)	78 (16.8%)	397 (85.7%)		
Total	376 (81.2%)	87 (18.8%)	463 (100.0%)		
Is victim's vehicle insured					
Yes	235 (62.2%)	58 (15.3%)	293 (77.5%)		
No	71 (18.8%)	14 (3.7%)	85 (22.5%)		
Total	306 (81.0%)	72 (19.0%)	378 (100.0%)		
Outcome					
Recovered completely with no deficit	275 (59.4%)	66 (14.3%)	341 (73.7%)		
Recovered but with some deficit	58 (12.5%)	11 (2.4%)	69 (14.9%)		
Left against medical advice (LAMA)	22 (4.8%)	7 (1.5%)	29 (6.3%)		
Referred to higher centre	6 (1.3%)	0 (0%)	6 (1.3%)		
Died	15 (3.2%)	3 (0.6%)	18 (3.9%)		
Total	376 (81.2%)	87 (18.8%)	463 (100.0%)		

Table 4: Outcome with time to reach hospital and duration of stay.

	Outcome				
	Recovered completely	Recovered with some deficit	Died	Total	P-value
Time to reach hospital					
< 6 Hours	243(83.5%)	42(14.4%)	6(2.1%)	291(100.0%)	0.001
>6 Hours	98(71.5%)	27(19.7%)	12(8.8%)	137(100.0%)	
Total (n=428)	341	69	18	428	
χ^2 =13.218; d.f.=2					
Duration of stay (Days)					
1-3	186(86.5%)	20(9.3%)	9(4.2%)	215(100.0%)	<0.001
4-7	134(80.2%)	27(16.2%)	6(3.6%)	167(100.0%)	
>7	21(45.7%)	22(47.8%)	3(6.5%)	46(100.0%)	
Total (n=428)	341	69	18	428	
χ^2 =43.570; d.f.=4					

DISCUSSION

Arriving at the hospital early has an important presence on the final result of accidents. The importance of first golden hour cannot be underestimated in reducing the death rate and morbidity due to RTAs. Gururaj noted 69% of total RTA victims reached hospital within 6 hours and remaining 31% reached after more than 6 hours had passed. However Mishra² found that 10% of victims were admitted to the hospital within one hour, 41.67% between 1 and 6 hours while the rest beyond 6 hours. 4.2% of victims contacted the infirmary inside the first 15 minutes, 20.4% reached within half an hour and 48% attained in the next one hour and remaining 16% were rushed to hospital in more than one and half hours.8 The results of the present survey were similar to other studies as the transportation system, road design and availability of nearby hospitals is more or less similar.

Availability of treatment at the site of the accident as well every bit on the way to hospital helps in cutting down the adverse result of chance events. Similar effects were noted by Singh and Dhattarwal where none of the victim received any treatment or first aid at the site of the fortuity. The first-aid coverage in the study conducted by Mishra was 59.16%. However Gururaj noted nearly 85% of victims had first aid soon after the trauma. This may be due to increased accessibility to trauma care there.

Hospital stay led to loss of work of victim and relatives. Apart from out of pocket expenditure, it also led to loss of school days of children as household had to take care of the victim. Pikoulis⁹ noted the common period of hospitalization for all groups was the 1–2 and the 22+days. Bidgoli noted mean length of hospital stay of 6.8 days.¹⁰

Insurance of vehicle is commonly practiced, but life of patients is rarely guaranteed. Like the present study

Bidgoli too noted majority of patients (58.9%) were without any insurance. ¹⁰ In order to decrease the out of pocket expenditure and losses incurred by patients and their relatives more and more individuals shall have some form of insurance which would cut down their medical bills.

The result is directly related to severity of injury incurred by the patient together with the quality of treatment they experience and the time to start the treatment. This is apparently described by a statistical significant difference when the final result was compared with time to get to the infirmary. Similarly duration of stay in hospital tends to be longer among those seriously injured and it increases the prospects of receiving an untoward effect.

Limitations

As this was a hospital based study and there are a great number of hospitals in Aligarh district where patient seeks medical or surgical attention. Thereby due to dispersion of patients to different hospital study group do not symbolize the overall burden RTAs in this section. As data was grounded solely on the data gathered from patients or their attendants, it may not be supported with actual issues or facts.

CONCLUSION

Arriving at the hospital early has direct presence on the final result of accidents. RTAs with head injury lead to variable out-of-pocket expenditure for patients and their concomitants. The legal age of victims does not have insurance, though insurance of vehicles is a usual pattern. In order to decrease the out of pocket expenditure and losses incurred by patients and their relative's insurance in one or another form is the need of the hour which would cut down their medical bills.

ACKNOWLEDGEMENTS

Authors wish to take this opportunity to thank Chief Medical Officer and other casualty staff of Jawaharlal Nehru Medical College Hospital along with residents of neurosurgery department for their support in data collection and making the work feasible for me.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

REFERENCES

- World Disasters Report 1998. International Federation of Red Cross and Red Crescent Societies .Oxford University Press 1998.
- 2. Mishra B, Sinha ND, Sukhla SK, Sinha AK. Epidemiological study of road traffic accident cases from Western Nepal. Indian J Community Medicine. 2010;35(1):115-121.
- 3. WHO: Global status report on road safety: Time for action. Geneva 2009. (www.who.int/violence_injury_prevention/ road_safety_status/2009).
- 4. Madan VS. Road Traffic Accidents: Emerging Epidemic. Indian J Neurotrauma. 2006;3(1):1-3.

- WHO: World report on road traffic injury prevention. Geneva 2004. (http://whqlibdoc.who.int/ publications/ 2004/ 9241562609.pdf)
- 6. Patil SS, Kakade RV, Durgawale PM, Kakade SV. Pattern of road traffic injuries: A study from Western Maharashtra. Indian J Community Med. 2008;33(1):56-8.
- Gururaj G, Kolluri SVR, Chandramouli BA, Subbakrishna DK, Kraus JF. Traumatic Brain Injury: National Institute of Mental Health & Neuro Sciences, Publication no. 61, Bangalore, India 2005.
- 8. Singh H, Dhattarwal SK. Pattern and distribution of injuries in fatal road traffic accidents in Rohtak (Haryana). JIAFM. 2004;26 (1):20-3.
- Pikoulis E, Filias V, Pikoulis N, Daskalakis P, Avgerinos ED, Tavernarakis G, et al. Patterns of injuries and motor-vehicle traffic accidents in Athens. Int J Injury Control and Safety Promotion. 2006;13(3):190-3.
- Bidgoli HH, Saadat S, Bogg L, Yarmohammadian MH, Hasselberg M. Factors affecting hospital length of stay and hospital charges associated with road traffic-related injuries in Iran. BMC Health Services Research. 2013;13:281.

Cite this article as: Urfi, Amir A, Khalil S, Hoda MF. Road traffic accidents with head injury: delay in treatment and socioeconomic and legal impact. Int J Community Med Public Health 2017;4:25-9.