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STUDY OF ROAD TRAFFIC ACCIDENTAL (RTA) DEATHS IN AND AROUND BARPETA DISTRICT: AN AUTOPSY BASED STUDY

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ABSTRACT: Road Traffic Accident is any vehicular accident occurring on the roadway i.e. originating on, terminating on, or involving a vehicle partially on the roadway. Causative factor of accident may be human or environmental. But whatever may be the cause once accident occurs, person falls and results either morbidity or mortality. According to the WHO road traffic accidents causes 2.5% of total deaths in age group of 5-44 years in India, which is as high as 10% and is among six leading causes of death. This study was carried out at Fakhruddin Ali Ahmed Medical College, Barpeta during the period from March' 2013 to August' 2014. All total 182 RTA cases were selected for the study. Where no of male victim outnumbered the female victims. Younger generation of the age group 21-30 years was commonly affected. It was also found that majority of the accidents were occurred on National Highways, mostly injured organs were lower limbs, upper limbs and head & neck region. Most of the people die on the spot with head injuries, where common offending vehicle was trucks. So this study was conducted to understand the magnitude of problem in and around Barpeta district with an intention to analyze the various factors related & to formulate preventive measures to reduce the burden caused by such accidents.

KEYWORDS: Fatal Road Traffic Accident, Injuries, Cause of Death, National Highways, Trauma Mortality.

INTRODUCTION: Accident has been defined as the sequence of events which occurs suddenly, unexpectedly and inadvertently under unforeseen circumstances and "Usually produces unintended injury or death or property damage."^[1] Road Traffic Accident is any vehicular accident occurring on the roadway i.e. originating on, terminating on, or involving a vehicle partially on the roadway.^[2] This includes collision of an automobile with a, rider / pillion rider / driver / passengers/pedestrian or another automobile or with a non-automobile on the roadway or fall from a moving vehicle causing injuries or death of the individuals is involved.

The causative factors may be human or/and environmental.^[3] The important factors are human errors like driver fatigue, poor traffic sense, speeding and overtaking, violation of traffic rules, mechanical fault of vehicle, poor road conditions, traffic congestion, road encroachment etc. out of which most of them are 'preventable'.

Whatever the cause may be, once the accident occurs and person falls from the vehicle, it definitely results in either morbidity or mortality.

The first death due to a motor vehicle was registered in 1896 in the United Kingdom.^[4] RTAs are considered as the third deadly killer, next to heart disease and cancer.^[5] So accidents are considered as a major epidemic of non-communicable disease in the present century.

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Worldwide, each year the number of people killed due to RTA is almost 1.2 million, while the number of injured may be as high as 50 million.^[6] In India, per year over 80,000 persons die in road traffic accident while over 1.2 million get injured seriously and about 300, 000 get disabled permanently. According to the WHO road traffic accidents causes 2.5% of total deaths in India & in age group of 5-44 years, which is as high as 10% and is among six leading causes of death.^[6]

As like any other disease accidents also has its own natural history and it obey the same epidemiological pattern i.e. the agent, the host and the environment, interacting together to produce injury or damage. They occur more frequently in certain age groups, at certain times of day and week and at certain localities.

Therefore, the present study is smallest attempt to understand the magnitude of problem and aimed at analyzing the various factors related to, so that it helps in formulating preventive measures to reduce the burden caused by such accidents.

MATERIALS AND METHODS: The present study was conducted at the Department of Forensic Medicine, Fakhruddin Ali Ahmed Medical College & Hospital, Barpeta. This study includes all fatal cases of Road traffic accidents brought for medico-legal postmortem examination to the mortuary of FAAMCH, Barpeta during the period of March 2013 to August 2014. From that period out of 778 autopsies, 182 cases of Fatal Road Traffic Accidents were selected for the present study. The decomposed bodies & controversial RTA cases were excluded from this study.

Information regarding the particulars of the victim e.g. age, sex, address, religion, occupation, personal habits, socio-economic status, the date, time and place of accident, type of offending vehicle, position of victim during RTA i.e. whether driver/pedestrian/occupant, nature & type of injury, the survival time of the victim following the injuries and cause of death were collected from the police papers e.g. inquest report, dead body chalan, hospital records, post-mortem examination reports and also by interviewing the relatives of the victim. All these information were recorded in a specially designed proforma, analyzed and tabulated.

OBSERVATION: All total 778 no of medico-legal autopsies conducted during the study period, out of which no of road traffic accident (RTA) were 206 cases (26.48%). But for this study 182 cases of road traffic accident cases are selected. The no of selected males were 159(87.36%) and the no of females 23(12.64%). The male/female ratio was approximately 6.91:1 [Table 1].

Sex	No. of cases	Percentage (%)
Male	159	87.36
Female	23	12.64
Total	182	100

TABLE 1: Sex wise distribution

The maximum number of RTA fatalities was recorded in the age group of 21-30 years (30.77%) and the minimum no of RTA cases were of above 70 years of age (1.10%). [Table 2]

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Sl. No.	Age (years)	No. of Cases					
		Male		Female		Total	
		No	%	No	%	No	%
1	0 – 10	2	1.26	1	4.35	3	1.65
2	11 – 20	15	9.43	0	0	15	8.24
3	21 -30	51	32.08	5	21.74	56	30.77
4	31 – 40	42	26.42	2	8.69	44	24.17
5	41 – 50	24	15.09	8	34.78	32	17.58
6	51 – 60	18	11.32	6	26.09	24	13.19
7	61 – 70	6	3.77	0	0	6	3.30
8	>71	1	0.63	1	4.35	2	1.10
	Total	159	100	23	100	182	100

TABLE 2 : AGE AND SEX DISTRIBUTION OF CASES

Among the deceased of this study the no of literates were 133(73.08%) & no of illiterates were 38(20.88%) while in 11(6.04%) cases information available regarding their educational status was doubtful. [Table 3]

Sl. No.	Educational status	No. of Cases					
		Male		Female		Total	
		No.	%	No.	%	No.	%
1.	Literates	121	76.10	12	52.17	133	73.08
2.	Illiterates	27	16.98	11	47.83	38	20.88
3.	No information	11	6.92	0	0	11	6.04
	Total	159	100	23	100	182	100

TABLE 3: EDUCATIONAL STATUS

According to season the maximum number of RTA cases (33.52%) occurred in the winter season followed by Autumn season (24.72%), then Spring season (21.43%) and lastly Summer season (20.33%). [Table 4]

Sl. No.	Season (Months)	No. of cases	Percentage (%)
1	Winter (Dec to Feb)	61	33.52
2	Spring (Mar to May)	39	21.43
3	Summer (Jun to Aug)	37	20.33
4	Autumn (Sept to Nov)	45	24.72
	Total	182	100

TABLE 4: SEASONAL VARIATION OF CASES

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The maximum numbers of RTA cases (48.35%) were reported to occur between 12 noon to 6 P.M. followed by the period of 6 A.M. to 12 noon (23.08%) then between 6PM to 12 midnight and lowest between 12 midnight to 6 AM. [Table 5]

Sl. No.	Time	No. of cases	Percentage (%)
1	12 Midnight – 6 AM	15	8.24
2	6 AM – 12 Noon	42	23.08
3	12 Noon – 6 PM	88	48.35
4	6 PM – 12 Midnight	37	20.33
	Total	182	100

TABLE 5: DIURNAL VARIATION

It was noted that majority of the accidents happened in the National Highways (62.09%) followed by State Highways (25.27%) and link roads (12.64%). [Table 6]

Sl. No.	Types of Roads	No. of Cases	Percentage (%)
1	National Highways	113	62.09
2	State Highways	46	25.27
3	Link road	23	12.64
	Total	182	100

TABLE 6: TYPES OF ROADS

According to the different types of Victims, the maximum numbers of victims (37.91%) are of pedestrians, which were followed by bicyclist (18.13%). [Table 7]

Sl. No.	Category of victim	No. of cases	Percentage (%)
1	Pedestrian	69	37.91
2	Bicyclist	33	18.13
3	Two wheeler		
	Rider	16	8.79
	Pillion rider	21	11.54
4	3/4/6- Wheeler or more		
	Driver	19	10.44
	Occupant	24	13.19
	Total	182	100

TABLE 7: ACCORDING TO THE TYPES OF VICTIMS

In this study, it is found that the frequent offending vehicles in 65(35.71%) deaths were trucks, which is followed by Buses in 42(23.08 %) deaths, two wheeler vehicles in 39(21.43%) cases Four wheeler vehicles in 30(16.48%) deaths, three wheeler vehicles in 4(2.20%) deaths and tractors in 2(1.10%) death. [Table 8]

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Sl. No.	Types of vehicles	No of cases	Percentage (%)
1	Truck	65	35.71
2	Bus	42	23.08
3	Tractor	2	1.10
4	LMV (4 wheeler)	30	16.48
5	Three wheeler	4	2.20
6	Two wheeler	39	21.43
	Total	182	100

TABLE 8: TYPES OF OFFENDING VEHICLES

In this study contusions & lacerations both were found in 143(78.57%) no of deaths each, graze abrasions found in 125 (68.68%) no of cases, while other types of abrasions were found in 128(70.33%) no of death cases, Fractures both of long bones and flat bones were found in 57 (31.32%) no of deaths. While it is seen that in 26(14.29%) no persons received penetrating wounds on their body and only in two persons amputation of limbs were seen. [Table 9]

Sl. No.	Injuries	Male	Female	Total	
				No	(%)
1	Grazed Abrasions	105	20	125	68.68
2	Other Abrasions	113	15	128	70.33
3	Contusions	129	14	143	78.57
4	Lacerations	125	18	143	78.57
5	Penetrating wound	18	8	26	14.29
6	Fractures	43	14	57	31.32
7	Amputations	2	0	2	1.10

TABLE 9: MAGNITUDE OF INJURIES

In this study it was also found that lower limbs received injuries in maximum no of RTA cases 159(87.36%); upper limbs received in 143(78.57%) no of deaths; Head and Neck was injured in 120(65.93%) RTA cases; Abdomen injured in 83(45.60%) and Chest injured in 40(21.98%) no of RTA cases respectively. While it was found that the spinal injuries were seen in only 7(3.85%) deaths. [Table 10]

Sl. No.	Part of the Body injured	Male	Female	Total	
				No	(%)
1	Head and Neck	108	12	120	65.93
2	Chest	36	4	40	21.98
3	Abdomen	72	11	83	45.60
4	Upper Limb	129	14	143	78.57
5	Lower Limb	141	18	159	87.36
6	Spine	4	3	7	3.85

TABLE 10: PARTS OF THE BODY INJURED

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Following the road traffic accidents, most of the victims 58(31.87%) died on the spot. While 35(19.23%) died within 1 hour after the accident, 43(23.63%) survived for a periods of 1-6 hrs, 25(13.74%) cases died within 6-12 hours, 6(3.30%) no died between 12-24 hours, 12(6.59%) RTA cases died between 1-3 days and 3(1.65%) no of cases survived for 3-7 days. [Table 11]

Sl. No.	Survival Period	Cases			
		Male	Female	Total	
				No	(%)
1	Spot	50	8	58	31.87
2	Within 1hr	31	4	35	19.23
3	1 – 6 hrs	38	5	43	23.63
4	6 – 12 hrs	21	4	25	13.74
5	12 – 24 hrs	4	2	6	3.30
6	1 – 3 days	12	0	12	6.59
7	3– 7 days	3	0	3	1.65
	Total	159	23	182	100

TABLE 11: PERIOD OF SURVIVAL OF VICTIMS

It was found that Head injuries has become the Cause of Death in maximum no of RTA cases 77(42.31%) in this study; next comes multiple injuries to different organs of the body i.e. in 36(19.78%) deaths then trauma to abdomen in 33(18.13%) cases, injuries to chest in 28(15.38%) no of cases and injuries to limbs in 8(4.40%) cases of RTA. [Table 12]

Sl. No.	Cause of Death	Cases		Total	
		Male	Female	No	(%)
1	Head Injury	69	8	77	42.31
2	Injury to the Chest	25	3	28	15.38
3	Injury to the Abdomen	29	4	33	18.13
4	Injury to the Limbs	7	1	8	4.40
5	Multiple Injuries	29	7	36	19.78
	Total	159	23	182	100

TABLE 12: CAUSE OF DEATH

DISCUSSION: Road traffic accidents (RTAs) are increasing with rapid pace and presently these are one of the leading causes of death in developing countries like India. In this study out of a total of 778 autopsies, 206 cases were due to RTA. This incidence is second only to suicidal death. Out of 206 cases 182 cases are included in this study. Here no. of males outnumbered females.^[7] This male predominance is also observed by other authors like Harish D, Sharma BR, Kumar S and Vij K,^[8] Biswas G, Verma S K, Sharma JJ and Aggarwal NK,^[9] and Tirpude BH, Naik RS, Anjankar AJ and Khajuria BK^[10] Which may be due to the fact that males are the main earning member of the families and so they has to spent most of their times outdoor, that exposes them to the hazards of roads.

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It was also observed that the most vulnerable age group was 21–30 years 56(30.77%) and the least affected group were those above 70 years 2(1.10%).^[11-12] Which is 2% according to Gupta S et al^[13] & 1% according to Menon A and Nagesh KR.^[12]

In present study it was found that literacy has no role in causation of accidents or deaths, as good number of people, who met with accidents which resulted in death, are from literate area.

Majority of these accidents occurred in the National Highway 113(62.09%).^[14,15,16] Which can be due to the fact that main 4 lane National highway passing through BARPETA district being constructed recently and is in good condition so most of the vehicles travel in high speed.

Maximum number of cases 61(33.52%) was recorded in the winter months, which is in concurrence with Dhillon S et al^[15] who reported 32% and also Singh H and Dhatarwal SK.^[16]

In the present study, it was found that during day time the maximum number of accidents occurred with a peak period between 12 Noon–6 PM, 88 no of cases (48.35%) followed by the period between 6 AM – 12 Noon 42 of cases (23.08%). These findings may be due the fact that the BARPETA is under developed area and main working hour of the people is the day time. Which is consistent with the findings of Kachre R V, Kachre VH and Asawa SS,^[15] but contrast to the observations made by Biswas G, Verma S K, Sharma JJ and Aggarwal NK^[9] & Ghangale AL^[16] where peak incidence of RTA found between 6 PM–12 Midnight.

In the present study commonest victims of fatal accident are pedestrians 69 no (37.91%). This may be due to lack of traffic sense & traffic rule ignorance of pedestrians or may be due to improper footpath. Which is followed by bicyclist 33 no (18.13%) and occupant of 3 or more wheeler vehicles 24 no cases (13.19%). Whereas, according to the observation of Singh H and Dhatarwal SK^[16] the frequent victims are pedestrians (28.7%) followed by vehicular occupants (25.8%) and motorcyclists (23%).^[11,17,18]

In the present study, main offending vehicles is trucks in 65 cases (35.71%) followed by buses in 42 cases (23.08%).^[10, 16, 17]

The predominant injuries seen in the present study are abrasions including the grazes. However lacerations and contusions are also sharing the major part of the injuries.^[19] Fractures and penetrating injuries, amputations and avulsions lacerations are seen in most of the run over accidents The body part which is found commonly injured is lower limb, which followed by upper limb, head & neck.

In this study it was found that after accident most of the victims die on the spot 58 (31.87%). Of those who survived after the accident, 19.23% died within 1 hrs & 23.63% died within 6 hours. Whereas finding of Singh H and Dhatarwal SK^[16] is 39.5% deaths within 1hr, and of Sharma BR et al,^[7] are 27% spot death & total 51% died within 6 hrs. The findings of this study reflect the severity of the injury, which in most of the cases are due to head injuries.

In the present study, the commonest cause of death is detected as due to head injuries 77 cases (42.31%) followed by injury to the multiple organs in 36 cases (19.78%) and injuries to abdomen 33(18.13%) & chest 28(15.38%) respectively. Which is different with the findings of Singh H and Dhatarwal SK^[16] and Biswas G et al^[9] who reported that shock and haemorrhage (36.9%) was the common cause of death followed by severe brain injury (19.6%).

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CONCLUSION: Road traffic accident are more common in the younger age group as a result there is a huge lose to country's economy. So incident of these accidental death has to be reduced with proper road safety measures, by educating public with traffic rules, by giving training to common public about emergency & first aid measures by constructing suitable and proper roads to accommodate the load of increasing transport and by establishing proper equipped treating centre.

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Lastly I tender my word of apology to those whose name is missing due to inadvertency and lapse of memory.

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