

Original Article

Verbal Autopsy Of Road Traffic Accident Cases in and around Dhanbad, Jharkhand

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ABSTRACT:

The purpose of this paper is to analyse the Road Traffic Accident(RTA) at national, state and district level. An alarming state has been created due to increasing incidents of RTA cases. At present RTA is one of the important cause of morbidity and mortality in India along with other developing countries. Every year approx. One million people are injured whereas 10% of which are killed. Thus India loses around 5 crores annually which is around 2-3% of Gross Domestic Product(GDP). The study shall help to find out the measures of Prevention. Research question – To find out epidemiological factors resulting in RTA. Study design - Descriptive study. Statistical analysis - Proportions.

Key words: RTA, Road Safety, Trauma, Injuries, Accidents.

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INTRODUCTION

World's first official car accident fatality was recorded on 31st August 1869 in IRELAND killing famous scientist "Mary Ward". Without intervention RTA will become 5th leading cause of death from its 9th place today by 2030.¹⁻⁴ RTA is defined as "A collision involving atleast one vehicle in motion on a public or private road that results in atleast one person being injured or killed".⁵ WHO defined Accident as –"An unpremeditated event resulting in recognisable damage". An accident is thus an incidental and unplanned event or circumstances with lack of intention.

It usually implies a definite epidemiological pattern which might have been avoided or can be prevented if circumstances leading to the accident had been recognised and suitably acted upon prior to its occurrence which is essential for proper national health planning. Many causes of RTA are largely or wholly confined to a particular age, age-sex group, specific places, time and day of the week and other socio-economic profile. Aside from a few regional injuries surveys, the current data on the number and mechanisms of RTA deaths rely on police and hospital records, both of which can substantially underestimate death rates in poor, rural and uneducated people who still constitute large proportions of the Indian.

Therefore, Accidents can be studied in terms of 'AGENT', 'HOST' and 'ENVIRONMENT'. It can be described or classified into 'TIME', 'PLACE' and 'PERSON'.

Reliable information on the pattern of deaths by causes in the country due to some major diseases is essential for proper health planning. Many causes of death are largely or wholly confined to a particular age, age-sex group, region and socio-economic profile of the households.^{1, 2} Information on the pattern of causes of death reflects the health status and in turn is vital for socio-economic planning of the communities. This will also help us in defining the population at risk from a given cause of death as a national priority for medical research.^{3, 4} A Road traffic injuries (RTI) are a large and growing public health burden, especially in low-income and middle-income countries (LMICs) where 90% of the world's deaths due to RTI are estimated to occur. There are few high-quality epidemiological data on RTI to guide the development, implementation and surveillance of evidence-based policy and programmes in LMICs. The number of deaths due to RTI in India is projected to rise with increasing motorisation.^{5, 6} Aside from a few regional injury surveys, the current data on the numbers and mechanisms of RTI deaths in India rely on police or

hospital records, both of which can substantially underestimate death rates in the poor, rural and uneducated people who still constitute large proportions of the Indian

MATERIAL AND METHODS-

This study was conducted at Patliputra Medical College, Dhanbad from 1st August 2017 to 31st July 2018 and records of 1st August 2017 to 31st July 2018 were analysed. The study group consisted of all the RTA victims coming to PMCH, Dhanbad and nearby Nursing homes.

Any injury on the road without involving a vehicle (eg. A person falling or slipping on the road or hit by an animal) or injury associated with a standing vehicle during loading and unloading were excluded from the study. The victims or their relatives or eye-witness present on the site of accident were interviewed to obtain informations causing accident. Hospital records were checked and visits to accidental areas were taken to assess 1st hand informations about nature & structure of road,

presence or absence of danger signboards, environmental condition and eye-witness statement.

The statistical analysis of data was done using SPSS version 11.0 windows. Chi-square and students t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistically significant.

OBSERVATION AND RESULT-

A total of 672 seriously or moderately injured victims involving 495 RTA incidents which occurred during the period 1st August 2017 to 31st July 2018 were included in the study out of which 127 deaths were analysed separately for cause of death. Number of male subjects was 78 and female subjects was 49. Pre-hospital deaths were 32, hospital deaths were 59, and unknown deaths were 36. Instant deaths at the time of accident occurred in 29 cases and 70 deaths occurred later. 71 deaths occurred due to motorcycle accident and 42 deaths due to non-motorcycle cases.

Table 1: Age and Sex distribution of RTA victims

AGE	MALE No.(%)	FEMALE No.(%)	TOTAL No.(%)
0 - 9	26 (4.8 %)	16 (12.5 %)	42 (6.25 %)
10 - 19	73 (13.5 %)	06 (4.6 %)	79 (11.75 %)
20 - 29	188 (34.7 %)	28 (21.4 %)	216 (32.14 %)
30 - 39	121 (22.3 %)	30 (23.2 %)	151 (22.47 %)
40 - 49	77 (14.2 %)	19 (14.3 %)	96 (14.29 %)
50 - 59	40 (7.4 %)	20 (15.5 %)	60 (8.92 %)
60 - 69	14 (2.6 %)	09 (6.8 %)	23 (3.42 %)
>69	03 (0.5 %)	02 (1.7 %)	05 (0.76 %)
	542 (100 %)	130 (100%)	672 (100%)

Verbal autopsy of 672 victims were analysed. In the present study most of the victims were in the age group 20 – 29 (32.14 %) with Male (34.7 %) and Females (21.4 %) followed by 30 – 39 year age group (22.47 %) with Male (22.3 %) and Females (23.2 %). Males were predominantly involved as victims to Females in proportion of **4.16 : 1**

Table 2: Occupation of the RTA victims

Labour class	180 (26.8 %)
Employees in service (Pvt, Govt, Shops, Restaurant, Malls and Construction)	152 (22.6 %)
Farmers and Agriculture labours	106 (15.7 %)
Students	119 (17.8 %)
House –wives	91 (13.6 %)
Senior citizens	15 (2.2 %)
Unemployed	05 (0.7 %)
Childrens < 5 years of age	04 (0.6 %)
TOTAL	672 (100 %)

Most of the victims are Job oriented people or students perhaps because they are in hurry to reach their site of job or after work are in hurry to reach home. Ignorance or Avoidance of traffic rules is the reason of RTA.

Table 3: Educational status of RTA victims

Educational Status	Victims No. (%)
Illiterate	140 (22.3 %)
Upto 5 th class	122 (19.6 %)
Upto 7 th class (Middle school)	116 (18.5 %)
Upto 10 th class (Matriculate)	180 (28.8 %)
Intermediate	22 (3.6 %)
Graduate	20 (3.22 %)
Post graduates	18 (2.88 %)
< 5 years of age	06 (1.1 %)
TOTAL	624 (100 %)

Table 4: Place of death of RTA victims

Place of death	Frequency
Pre hospital	32
Hospital	59
Unknown	36

Table 5: RTA deaths on the basis of Modes of Transportation

Modes of Transportation	Frequency
Motorcycle	71
Non-motorcycle	42
Unknown	14

Among 624 who could be verified for educational status 180 (28.8 %) were between 8th to 10th class and overall 558 (89.2 %)were illiterates and educated upto only 10th class. This signifies increasing RTA cases among Adolescents with vehicles on the road whereas most of them do not possess a valid driving license neither they use helmets . On the other hand decreasing events among Intermediates and above show increasing sense of responsibility and use of helmets and seat-belts.

DISCUSSION:

In the present study, we assessed verbal autopsy of road traffic accidents in Dhanbad, Jharkhand. We observed that there were 127 deaths due to road traffic accidents during the study period. 56% of deaths occurred due to motorcycle related accidents. The results were compared to previous studies. Ganapathy SS et al⁹ reported the development of the VA methods and principal finding from a validation study. A cross sectional study on nationally representative sample deaths that occurred in Malaysia during 2013 was used. A VA questionnaire suitable for local use was developed. Completed questionnaires were reviewed by trained physicians who assigned multiple and underlying causes. Corresponding MR diagnosis with matched sample of the VA diagnosis were available in 2172 cases for the validation study. Sensitivity scores were good (>75%) for transport accidents and certain cancers. Moderate sensitivity (50% - 75%) was obtained for ischaemic heart disease (64%) and cerebrovascular disease (72%). The validation sample for deaths due to major causes such as ischaemic heart disease, pneumonia, breast cancer and transport accidents show low cause-specific mortality fraction (CSMF) changes. The scores obtained for the top 10 leading site-specific cancers ranged from average to good. They concluded that VA is suitable for implementation for deaths outside the health facilities in Malaysia. Klinjun N et al¹⁰ conducted a study aimed to create an appropriate model using verbal autopsy (VA) data to estimate transport accident deaths from vital registration data in Thailand. A sample of 9644 VA deaths was obtained from the Thai Ministry of Public Health. VA assessed transport accidents accounted for 546 deaths (5.7% of sample). Logistic regression was used to model transport accident deaths classified by 9 provinces, 16 gender-age groups, 14 combinations of vital reported cause groups, and place of death (in or outside hospital). The receiver operating characteristic curve was used to match the number of reported transport accident deaths to the number predicted by the model with sensitivity 73.8% and false positive rate 1.6%. The estimated transport accident deaths ranged from 1.68 to 2.65 times higher

than the vital registration data reported according to gender-age groups.^{9, 10} Murray CJ et al¹¹ investigated the validity of five automated VA methods for assigning cause of death: InterVA-4, Random Forest (RF), Simplified Symptom Pattern (SSP), Tariff method (Tariff), and King-Lu (KL), in addition to physician review of VA forms (PCVA), based on 12,535 cases from diverse populations for which the true cause of death had been reliably established. Three automated diagnostic methods, Tariff, SSP, and RF, but not InterVA-4, performed better than physician review in all age groups, study sites, and for the majority of causes of death studied. For adults, CSMF accuracy ranged from 0.764 to 0.770, compared with 0.680 for PCVA and 0.625 for InterVA; CCC varied from 49.2% to 54.1%, compared with 42.2% for PCVA, and 23.8% for Inter VA. For children, CSMF accuracy was 0.783 for Tariff, 0.678 for PCVA, and 0.520 for InterVA; CCC was 52.5% for Tariff, 44.5% for PCVA, and 30.3% for InterVA. They concluded that physician review of verbal autopsy questionnaires is less accurate than automated methods in determining both individual and population causes of death. Hsiao M et al conducted a nationally representative mortality survey where at least two physicians coded each non-medical field staff's verbal autopsy reports. RTI mechanism data were extracted from the narrative section of these reports. The 2299 RTI deaths in the survey correspond to an estimated 183 600 RTI deaths or about 2% of all deaths in 2005 nationally, of which 65% occurred in men between the ages 15 and 59 years. The age-adjusted mortality rate was greater in men than in women, in urban than in rural areas, and was notably higher than that estimated from the national police records. Pedestrians (68 000), motorcyclists (36 000) and other vulnerable road users (20 000) constituted 68% of RTI deaths (124 000) nationally. Among the study sample, the majority of all RTI deaths occurred at the scene of collision (1005/1733, 58%), within minutes of collision (883/1596, 55%), and/or involved a head injury (691/1124, 62%). Compared to non-pedestrian RTI deaths, about 55 000 (81%) of pedestrian deaths were associated with less education and living in poorer

neighbourhoods. They concluded that in India, RTIs cause a substantial number of deaths, particularly among pedestrians and other vulnerable road users.^{11, 12}

CONCLUSION:

From the results of the present study, we conclude that male subjects are more common to the road traffic accident deaths and more deaths occur due to motorcycle related accidents. Victims are illiterate more than literate, ignorant of traffic rules, immature age of driving in bad weather and due to negligence of safety measures.

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