ICD 10 Classification of Non-Fatal Road Traffic Accident Cases Admitted in Tertiary Care Hospital in Central India

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ABSTRACT

Background: In the background of high epidemiologic proportions of road traffic accidents and the fact that very few exploratory studies were reported from central India, the present study was undertaken to study ICD 10 classification of non-fatal road traffic accident.

Methodology: Total 300 road traffic accident cases admitted in tertiary care hospital in city during period of one year (20th may 2014 to 22nd may 2015) were included in the study with predefined inclusion and exclusion criteria. ICD 10 coding of study subjects was recorded in the proforma.

Results: Out of total 300 accident cases there were 34 (11.33%) pedal cyclist, 148 (49.33%) motorcycle occupants and 11 (3.67%) were occupants of three wheeler. Out of 83 pedestrians injured, 55 (66.26%) had collision with 2 or 3 wheeler vehicles. Out of 148 motorcycle occupants who were injured in accidents, 47 (31.71%) had non collision transport accidents. Out of 19 car occupants injured in accidents, 8 (42.11%) had non collision transport accidents

Conclusions: Majority of pedestrians and pedal-cyclists injured had collisions with two or three wheelers. Majority of motorcycle occupants injured had non-collision transport accidents.

Key Words: Road traffic accidents, ICD 10, Pedestrian.

INTRODUCTION

Although in the year 2012, Maharashtra had the highest number of registered vehicles in the country, but highest number of deaths due to road accidents during this year were reported in Tamil Nadu (16,175) followed by Uttar Pradesh (15,109), Andhra Pradesh (14,966) and Maharashtra (13,936)[1]

Road traffic injuries remain an important public health problem at world, regional and national levels. Data on magnitude of problems and risk factors involved are essential to developing a systemic approach to road safety.[2] A comprehensive assessment of the magnitude of road traffic injuries should consider not only mortality but also nonfatal injuries, resulting disabilities as well as economic cost of road traffic injuries and cost effective

interventions.[2] A number of other indicators can, if monitored accurately and regularly, provides essential information to governments targeting their interventions and in evaluating effectiveness of current national road safety programs.[2] Only by systematic and data-led management of the leading road injury problems will significant reductions in exposure to crash risk and in the severity of crashes be achieved.[2]

Hence in the background of high epidemiologic proportions of road traffic accidents and the fact that very few exploratory studies were reported from central India, the present study was undertaken to study distribution of non-fatal road traffic accident cases admitted in tertiary care hospital according to ICD 10 classification.

MATERIALS & METHOD

The present hospital based cross sectional study was carried out in tertiary care hospital of the city in central India. Duration of study was from September 2013 to November 2015. The period of data collection was one year i.e. from 20th May 2014 to 22th May 2015. Approval from institutional ethics committee was taken before initiation of study. Road traffic accident cases admitted in tertiary care hospital in city during period of one year (20th may 2014 to 22nd may 2015) were included in the study with following inclusion and exclusion criteria.

Road traffic accident cases admitted in hospital, who were conscious & co-operative, and who had given written informed consent were included.

Road traffic accident cases who were admitted in surgical intensive care unit (SICU) of hospital, who took discharge against medical advice (DAMA), who brought dead in casualty department or who were unable to participate in the study due to impaired health status were excluded from the study.

Distribution of road traffic accident cases reported to casualty department of tertiary care hospital was recorded on each day to identify accident cases admitted in hospital on that day. During data collection of one year, distribution of road traffic accident cases reported in casualty was as follows,

Table 1 Distribution of Road traffic accident cases reported to casualty

Distribution of road traffic accident cases reported at casualty	Cases (%)
Managed on OPD basis	1877 (70.86)
Discharged against medical advice	196 (7.4)
Admitted in ward	481 (18.16)
Admitted in Surgical intensive care unit	27 (1.02)
Brought dead	68 (2.56)
Total	2649 (100)

Table 2 Distribution of 481 road traffic accident cases admitted in hospital

Distribution of admitted road traffic accident cases	Cases (%)
Number of cases interviewed	300 (62.37)
Were not able to participate in study	131 (27.13)
Consent not given	50 (10.5)
Total	481 (100)

There were 481 road traffic accident cases admitted in hospital during period of one year. Distribution these 481 cases admitted in hospital was as follows. Out of these 481 road traffic accident cases 300 were interviewed and examined for the study.

A pre-tested proforma was used for collecting relevant information from study subjects by direct interview method. Information regarding distribution of non-fatal road traffic accidents according to ICD 10 classification[3] was recorded in the proforma. Statistical analysis was carried out with help of software Epi Info version 7.2. Results were presented in percentages.

RESULTS

Table 3 shows out of total 300 accident cases there were 83 (27.67%) pedestrians. Out of 83 pedestrians injured, 55 (66.26%) had collision with 2 or 3 wheeler vehicles. This was followed by 18 (21.69%) pedestrians who had collision with car/pick-up truck/van, followed by 6 (7.23%) who had collision with heavy motor vehicle/bus. 2 (2.42%) had collision with pedal cyclist, 1 (1.20%) had collision with railway and 1 (1.20%) had collision with unspecified transport.

Table 3 Distribution of pedestrians according to road traffic injury codes (ICD10) (n=83)

In collision With	Pedestrians (%)	ICD Code*
Pedal cyclist	2 (2.42)	V01
2 or 3 wheeler	55 (66.26)	V02
Pick-up truck /van /car	18 (21.69)	V03
Heavy motor vehicle/ bus	6 (7.23)	V04
Railway	1 (1.2)	V05
Other unspecified transport	1 (1.2)	V09

*In 3rd column there are codes as per ICD 10 classification.[3]

Table 4 shows that out of total 300 accident cases there were 34 (11.33%) pedal cyclist, 148 (49.33%) motorcycle occupants and 11 (3.67%) were occupants of three wheeler. Out of total 34 pedal cyclist injured in accidents, 10 (29.42%) had collision with 2 or 3 wheeler vehicles followed by 9 (26.47%) who had collision with heavy motor vehicle/bus, 8 (21.53%) who had collision with car/pick-up truck/van, 2 (5.88%) who had collision with stationary object and 1 (2.94%) who had collision with animal drawn vehicle on road i.e. non motor transport. Out of 34 pedal cyclist, 4 (11.76%) were injured in non-collision transport accidents.

Out of 148 motorcycle occupants who were injured in accidents, 47 (31.71%) had non collision transport accidents i.e. they lost their control at turn or slipped while travelling, 37 (25%) motorcycle occupants had collision with pick-up truck/car/van, 30 (20.72%) had collision with 2 or 3 wheeler vehicle, 25 (16.89%) had collision with heavy motor vehicle/bus, 4 (2.30%) had collision with non-motor transport, 2 (1.35%) had collision with fixed or stationary object, 2 (1.35%) had collision with other unspecified transport and 1 (0.68%) motorcycle occupant had collision with pedal cyclist.

Table 4 Distribution of 2 &3 wheeler vehicle occupants according to road traffic injury codes (ICD 10)

In collision with	Mode of transport of study subjects					
	Pedal-cyclist (%)	ICD Code*	Motorcycle (%)	ICD Code*	Three wheeler (%)	ICD Code*
Pedal cycle	0 (0)	V11	1 (0.68)	V21	0 (0)	V31
2 or 3 wheeler	10 (10)	V12	30 (10.72)	V22	0 (0)	V32
Pick-up truck /van /car	8 (8)	V13	37 (8.25)	V23	3 (27.28)	V33
Heavy motor vehicle/ bus	9 (9)	V14	25 (9.89)	V24	4 (36.36)	V34
Non motor transport	1 (1)	V16	4 (1.3)	V26	0 (0)	V36
Fixed/ stationary object	2 (2)	V17	2 (2.35)	V27	0 (0)	V37
Non collision transport	4 (4)	V18	47 (4.71)	V28	4 (36.36)	V38
Other unspecified	0 (0)	V19	2 (0.35)	V29	0 (0)	V39
Total (N=193)	34 (34)		148 (34.100)		11 (100)	

*In column 3, 5 & 7 of table no. 4 there are codes as per ICD 10 classification[3]

Table 5 Distribution of four or more wheeler vehicle occupants according to road traffic injury codes (ICD 10)

In collision with	Mode of transport of study subjects					
	Car (%)	ICD Code*	Pick–up truck/van (%)	ICD Code*	Heavy motor vehicle/ bus (%)	ICD Code*
Pedestrian/animal	1 (5.26)	V40	0 (0)	V50	0 (0)	V60
Pick-up truck /van /car	2 (10.53)	V43	0 (0)	V53	0 (0)	V63
Heavy motor vehicle/ bus	3 (15.79)	V44	1 (50)	V54	1 (33.33)	V64
Fixed/ stationary object	5 (26.31)	V47	0 (0)	V57	0 (0)	V67
Non collision transport	8 (42.11)	V48	1 (50)	V58	2 (66.67)	V68
Total (n=24)	19 (100)		2 (100)		3 (100)	

*In column 3, 5 & 7 there are codes as per ICD 10 classification.[3]

Out of 11 three wheeler occupants injured in accidents, 4 (36.36%) had collision with heavy motor vehicle/bus followed by 4 (36.36%) who had non collision transport accidents and 3 (27.28%) who had collision with pick-up truck/car/van.

Table no. 5 shows that out of total 300 accident cases there were 19 (6.33%) car occupants, 2 (0.67%) were pick-truck/van occupants & 3 (1%) were heavy motor vehicle/bus occupants. Out of 19 car occupants injured in accidents, 8 (42.11%) had non collision transport accidents i.e. their cars lost control at turn or while travelling, followed by 5 (26.32%) who had collision with fixed or stationary object, 3 (15.79%) who had collision with heavy motor vehicle/bus, 2 (10.53%)who had collision with car/pick-up truck/van and in 1 (5.26%) case car had accident with pedestrian in which car occupant was injured due to sudden application of brakes.

Out of 2 pick-up truck/van occupants injured in accidents, 1 (50%) had collision with heavy motor vehicle/bus and 1 (50%) had non collision transport accident i.e. lost control at turning of road. Out of total 3 heavy motor vehicle/bus occupants injured in accidents, 2 (66.67%) had non collision transport accidents i.e. lost control over vehicle while travelling and 1 (33.33%) had collision with another heavy motor vehicle/bus.

DISCUSSION

The present cross sectional study was carried out in a tertiary care hospital in central India. Three hundred road traffic accident cases were studied in detail with regard to ICD 10 classification. In the present study it was observed that out of 83 pedestrians injured, 66.26% (V02) had collision with 2 or 3 wheeler vehicles. This was followed by 21.69% (V03) pedestrians who had collision with car/pick-up truck/van, followed by 7.23% (V04) who had collision with heavy motor vehicle/bus. 2.42% (V01) had collision with pedal cyclists, 1.20% (V05) had collision with railway and 1 (1.20%) (V09) had collision with unspecified transport. **WHO World Report on Road Traffic Injury Prevention (2004)[4]** showed that in Europe suggests that two thirds of all fatally-injured pedestrians were hit by the front of a car; 11% were hit by other parts of a car. In India, in the cities and on rural highways, buses and trucks were involved in more than 50% of the crashes affecting pedestrians. **Jha Net al (2004)[5]** found that 24.4% pedestrians were injured by motorized two wheelers and 21.9% by truck. Four wheelers caused injury to 21.2% and buses to 12.5% pedestrians. **Manna N et al (2013)[6]** found that of 70 injured pedestrians, 34.28% were injured by collision with heavy transport vehicles or buses (V04), 51.42% were injured by 2 or 3 wheeled motor vehicles or cars (V 02 & V 03), 5.71% had colli-

sion with pedal cyclists (V01) and in 8.57% the exact type (V09) could not be specified.

The present study showed that out of 34 pedal cyclists injured in accidents, 29.42% (V12) had collision with 2 or 3 wheeler vehicles followed by 26.47% (V14) who had collision with heavy motor vehicle/bus, 21.53% (V13) who had collision with car/pick-up truck/van, 5.88% (V17)who had collision with stationary object and 1 (2.94%) (V16) who had collision with animal drawn vehicle on road i.e. non motor transport. Out of 34 pedal cyclists, 11.76% (V18) were injured in non-collision transport accidents. **Manna N et al (2013)[6]** found that among the pedal cyclist injury, 50% each were injured by collision with buses (V14) and non- collision type accidents (V18).

The present study also showed that out of 148 motorcycle occupants who were injured in accidents, 31.71% (V18) had non-collision transport accidents i.e. they lost their control at turn or slipped while travelling, 25% (V23) motorcycle occupants had collision with pick-up truck/car/van, 20.72% (V22) had collision with 2 or 3 wheeler vehicle, 16.89% (V24) had collision with heavy motor vehicle/bus, 2.30% (V26) had collision with non-motor transport, 1.35% (V27) had collision with fixed or stationary object, 1.35% (V29) had collision with other unspecified transport and 0.68% (V21) motorcycle occupant had collision with pedal cyclist. **Richter M (2001)[7]** in their prospective study two-hundred twenty-six motorcyclists found that collision opponents were cars (57.8%), trucks (8.0%), pedestrians (2.3%), bicycles (1.4%), two wheel motor vehicles (0.8%), and others (4.2%). **Behera C et al (2007)[8]** found that among ninety four cases of motorcycle fatalities from South Delhi, heavy motor vehicle was the offender vehicle in maximum number of cases (34.04%). **Manna N et al (2013)[6]** found that of the 36 motor cyclists injured (V 21, 22, 23, 24, 27, 28 and 29), 36.11% were injured by collision with heavy transport vehicle, 30.55% by collision with 3 wheelers, 11.11% and 5.55% riders with cars and pedal cyclists respectively, 11.11% had no collision but the motor cycle had turned upside down due to inexperienced drivers or broken roads and in 5.5% type of vehicle with which the collision occurred was not specified.

In the present study it was observed that out of 11 three wheeler occupants injured in accidents, 36.36% (V34) had collision with heavy motor vehicle/bus followed by 36.36% (V38) who had non-collision transport accidents. Out of 19 car occu-

pants injured in accidents, 42.11% (V48) had non collision transport accidents i.e. their cars lost control at turn or while travelling. Out of 2 pick-up truck/van occupants injured in accidents, 1 (50%) (V54) had collision with heavy motor vehicle/bus and 1 (50%) (V58) had non collision transport accident i.e. lost control at turning of road. Out of total 3 heavy motor vehicle/bus occupants injured in accidents, 2 (66.67%) (V69) had non collision transport accidents i.e. lost control over vehicle while travelling and 1 (33.33%) (V64) had collision with another heavy motor vehicle/bus. Similar results were reported by **Manna N et al (2013). [6]**They found that among the accidents involving the occupants of 3 wheeled motor vehicles (7.8%) and pickup trucks & vans (6.8%), majority were injured with non-collision type of accidents (V38 and V 58), whereas in heavy transport vehicles (5.8%)most of the injuries occurred due to collision with a stationary object (V67) like a tree or roadside constructions.

CONCLUSION

Majority of pedestrians and pedal-cyclists injured had collisions with two or three wheelers. Majority of motorcycle occupants injured had non-collision transport accidents.

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