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EPIDEMIOLOGICAL FACTORS OF ROAD TRAFFIC ACCIDENT IN NORTH INDIAN POPULATION

Trauma Surgery

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ABSTRACT

Road traffic accidents are one of the leading causes of morbidity and mortality worldwide. In India more than million are injured annually and about a lakh are killed in road traffic accidents reported in world health organization report. The increasing number of vehicles has consequently led to increased opportunities for road traffic accidents. Road traffic accidents can be defined as a when a vehicle that is moving along a roadway collides with another vehicle or object. The main objectives of this paper is to study the main cause of accidents and to assess the epidemiological factors related to road traffic accident cases. It is a retrospective observational study. Study was performed in trauma center of King George Medical University, Lucknow from January 2012 to January 2017 .The main study variables which were included in this study are:-Demographic, time, age, gender, vehicle type, Mode of Injury, Speed and area wise distribution.

KEYWORDS

Trauma, Road Traffic Accidents, Epidemiological Factors.

Introduction:

Trauma is fast becoming the leading cause of Morbidity and Mortality according to various reports including WHO. It has been predicted that trauma will be leading cause of Morbidity by 2030.Amongst all the causes of Trauma Road, Traffic injuries are the major cause of death and disability. Trauma is defined as any bodily wound or shock produced by sudden physical injury, as from accident, injury or impact. In trauma patients there are wide variety of symptoms that are associated with trauma for example, unconsciousness, internal bleeding, disorientation, shock or death. Trauma is leading cause of death and disability in young population. Road traffic accidents have emerged as major global health problem of this century and by 2020 this will become severe problem [1]. Among children aged 5–14 years, and young people aged 15–29 years, road traffic injuries are the second-leading cause of death worldwide [2]. An accident has been defined as an unexpected unplanned occurrence which my involve injury. The loss in road traffic accident is enormous in economy and health related issues and are burdening health care systems in countries around the world. Accidents tragically are not often due to ignorance, but due to the carelessness, thoughtlessness and over-confidence. Human, vehicle and environmental factors play role before , during and after a trauma event Road Traffic Accidents represent a major epidemic of non-communicable diseases in the present century and follow the same epidemiological patterns as any other disease that is host, agent and the environment interacting together to produce injury or damage. It occurs more frequently to certain area, circumstances, time and localities. There are some people who are prone to accidents because of alcohol intoxication not wearing helmets, seat belts, speed and drug etc. The roads of different types, widths, with varying topographic and climatic conditions, influence the travel pattern in rural and urban areas. Walking and cycling remain the dominant modes of transport in small cities and rural areas.[14]

Material and Methods: This study was conducted in Trauma centre of King Georges Medical University, Lucknow, India from 1 January 2012 to 31 December 2017.The study group consist of all the road traffic accidental cases reporting in trauma centre causality and Emergency of Department of Surgery (General), department of orthopedic and department of neurosurgery Performa was designed for this purpose in which interview pattern is used. If accident victims were not in the condition to answer all the questions, in those cases attendants were interviewed for that purpose. The Performa included information in regard to age, sex, date, time, mode of injury, Demographic data, type of vehicle and type of road. Total number of patients enrolled in the study was 11280. (n=11280)

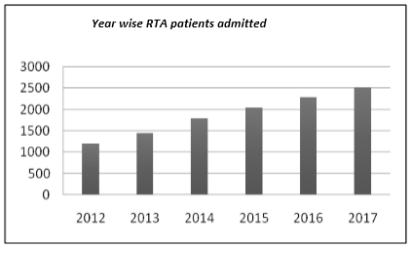
Inclusion and exclusion criteria – All patient of RTA admitted in KGMU were included. The patients who were unable to give information as per Performa were excluded.

Results: This study was an observation study and based on questionnaire method. Total 11,280 patients were enrolled and completed the study. The results are as below.

Year wise RTA patient admitted

Year	No. of Patients
2012	1200
2013	1440
2014	1800
2015	2040
2016	2280
2017	2520
Total	**11280**

Figure-1 Year wise RTA patients admitted

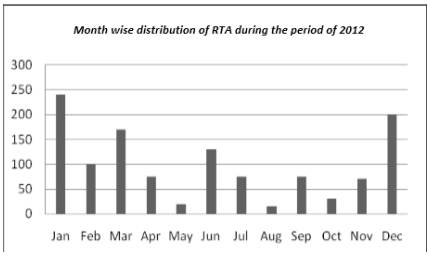


Month wise distribution of RTA during the period of the study (2012 – 2017) Year 2012

M Month	No of Patients
Jan	240
Feb	100
Mar	170
Apr	75
May	20
Jun	130
Jul	75
Aug	15
Sep	75
Oct	30
Nov	70
Dec	200
Total	1200

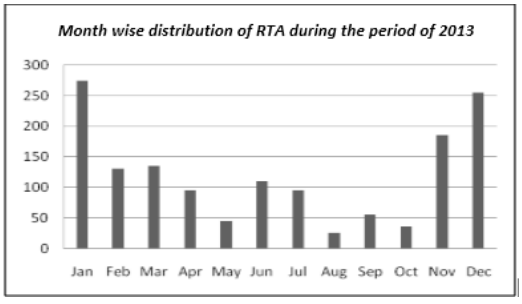
Figure-2 Month wise distribution of RTA during the period of the study (2012 – 2017)

Year 2012



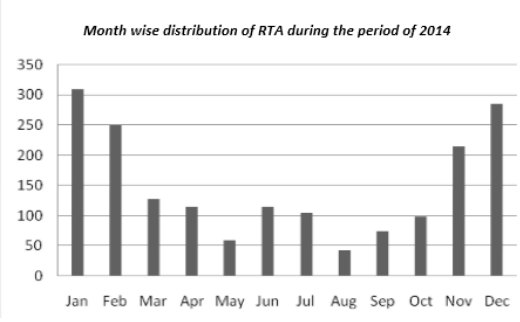
Month	No. of Patients
Jan	275
Feb	130
Mar	135
Apr	95
May	45
Jun	110
Jul	95
Aug	25
Sep	55
Oct	35
Nov	185
Dec	255
Total	1440

Figure-3
Year 2013



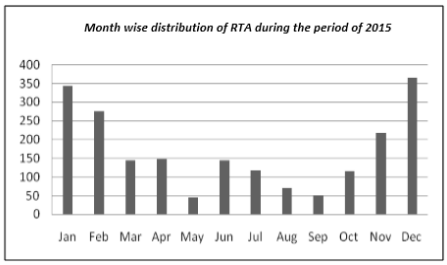
Month	No. of patients
Jan	310
Feb	250
Mar	128
Apr	115
May	60
Jun	115
Jul	105
Aug	43
Sep	75
Oct	99
Nov	215
Dec	285
Total	1800

Figure-4
Year 2014



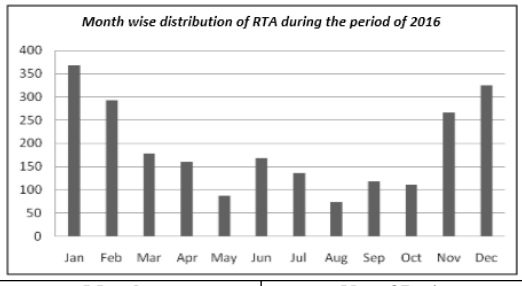
Month	No. of Patients
Jan	345
Feb	275
Mar	145
Apr	148
May	45
Jun	145
Jul	118
Aug	70
Sep	51
Oct	115
Nov	218
Dec	365
Total	2040

Figure-5
Year 2015



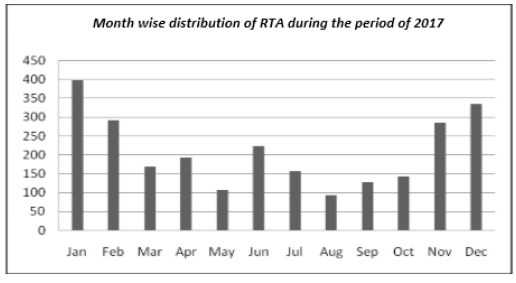
Month	No. of patients
Jan	368
Feb	292
Mar	178
Apr	159
May	87
Jun	168
Jul	136
Aug	73
Sep	117
Oct	111
Nov	266
Dec	325
Total	2280

Figure-6
Year 2016



Month	No. of Patients
Jan	398
Feb	292
Mar	169
Apr	193
May	106
Jun	224
Jul	156
Aug	93
Sep	127
Oct	142
Nov	285
Dec	335
Total	2520

Figure-7
Year 2017

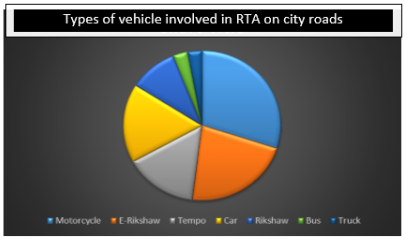


Type of Vehicle involved in RTA on City Roads.

City Road Accidents	
Vehicles	**No. of cases in %**
Motorcycle	30
E-Rikshaw	22

Tempo	15
Car	17
Rikshaw	10
Bus	3
Truck	3

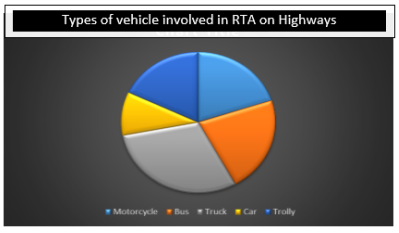
Figure-8



Types of vehicle involved in RTA on Highways

Highway Road Accidents	
Vehicles	**No. of cases in %**
Motorcycle	20
Bus	22
Truck	30
Car	10
Trolly	18

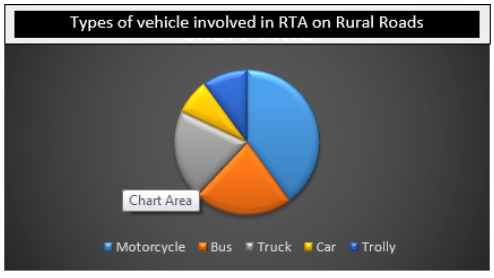
Figure-9



Type of Vehicle involved in RTA on Highways.

Rural Road Accidents	
Vehicles	**No. of cases in %**
Motorcycle	40
Bus	22
Truck	20
Car	8
Trolly	10

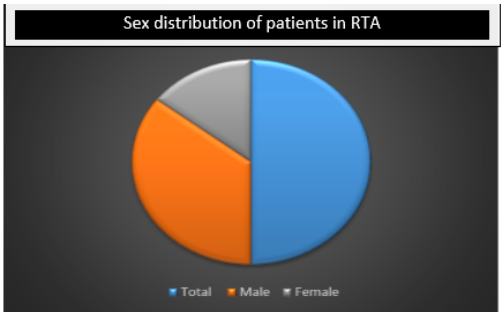
Figure-10



Sex distribution of patients of RTA

Total	Male	Female
11280	8000	3280

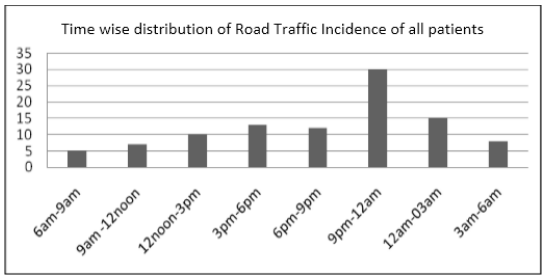
Figure-11



Time wise distribution of Road traffic Incidence of all patients

Time	No. of accidents %
6am-9am	5
9am -12noon	7
12noon-3pm	10
3pm-6pm	13
6pm-9pm	12
9pm-12am	30
12am-03am	15
3am-6am	8

Figure-12



There is a increase of Road Traffic Accident since 2012. The number of Road Traffic Accident victims showed more than 100% increase in 7 years.

January and December months had increased incidence of Road Traffic Accident. Over all winter season showed higher incidence of Road Traffic Accident.

City roads had increased Motorcycle accidents while on Highways Trucks and goods carries were more prone to Road Traffic Accident. Rural areas had more incidence of accidents with motorcycles.

Male's population was more involved in Road Traffic Accident.

Maximum number of Road Traffic Accident occurred between 9:00 PM & 12:00AM mid night and showed more incidence in the night.

Discussion :- The term 'injury' by definition means that there is a body lesion due to an external cause, either intentional or unintentional, resulting from a sudden exposure to energy (mechanical, electrical, thermal, chemical or radiant) generated by agent–host interaction. This leads to tissue damage, when it exceeds the physiological tolerance of the individual (Robertson 1983; Baker 2000). [10] On the contrary, injury can also occur due to the sudden withdrawal of a vital requirement of the body, e.g. withdrawal of air in drowning. Thus, an injury is damage to a body organ which occurs rapidly and is visible, with the causative mechanism being sudden energy transfer [11] (Barss et al. 1998). Four factors that differentiate injury from other health conditions are: (i) a definite interaction between agent– host and environment, (ii) acuteness of the event, (iii) varying severity, and (iv) chances of repetitiveness.

Information from around the world indicates that injuries account for more than half the deaths in the age group of 5–44 years. An examination of 'years of potential life lost' indicates that injuries are the second most common cause of death after 5 years of age in India (Mohan and Anderson 2000) [12]. Like any other health problem, injuries also have a definitive causative pattern and mechanism in terms of agent (product/vehicle), host (human beings) and environmental (roads, homes, workplaces) factors along with system-related issues. A precise understanding of this mechanism is crucial to develop and implement mechanisms for prevention and control of injuries. Every year, injuries contribute to a significant number of deaths, hospitalizations (for short and long periods), emergency care, disabilities (physical, social and psychological), amputations, disfigurement, pain, suffering and agony. In addition, injuries also result in disruption of several activities leading to loss of work, income, education and other social activities, causing long-term suffering among survivors and families. The extent of economic loss is yet to be recognized due to lack of systematic research.

As India moves forward in its quest for growth, development and economic prosperity, the dark and ugly side of this progress is rapidly emerging due to the absence of accompanying safety systems.

The number of vehicles registered in India is shown in Table 1.

Table 1
Total number of registered vehicles: (in thousands)
(Source: Ministry of Road Transport and Highways)

Year	India	Uttar Pradesh
2001	54991	4921
2012	159491	15445
Growth /year %	10./%	10.9%

These data show that the total number of vehicles increased from 37 million in 1997 to 73 million in 2012. This represents an annual average growth rate of about 11% for cars and motorized two-wheelers and 7% for trucks and buses. However, these numbers are probably overestimates as personal vehicle owners register their vehicles and pay the road tax once when they buy the vehicle and are not required to pay an annual tax. Because of this, a large number of vehicles remain on the official record even when they are not in use any more.

Recent estimates suggest that the actual number of vehicles infused may be about 60-70% of the official number.

Table 2 shows the number of motor vehicles registered in India in 2009 and 2012.

Table 2
Number Of Motor Vehicles Registered In India

Year	MTW	LMV	Jeeps/Cars and Taxies	Buses	Goods carrier vehicle	Others
2009	82402105	3146619	15226616	1205793	5512924	20687912
2012	115419175	4242968	25714930	1296764	7658393	9435510

(Source: Transport Research Wing, Ministry of Surface Transport)

At the same time new vehicles in from of E-Rickshaw & battery operated vehicles etc. also occupied the Indian Roads .Animal driven Vehicles, non-registered vehicles and non-motorized vehicle also have their presence on the roads.

Since the data collection system lags behind therefore the actual Road load of vehicles always lags behind and is estimated to be 0.5 to 1.00% more than the actual Road occupancy.

Details of traffic crashes are not available at the national level. While the official Road Traffic fatality data may be close to the actual number, the injury data are grossly under estimated.

Road traffic fatalities have been increasing at about8% annually for the last ten years and show no signs of decreasing. Two modelling exercises have attempted to predict the time period when we might expect fatality rates to start to decline in a range of developed countries. Cropper and Kopits [13] predicted that fatalities in India would reach a total of about 198,000 per year before starting to decline in 2042. Koornstra [1] predicted an earlier date of 2030 for the peak traffic fatalities in India[12]. If we assume that the present growth rate of 8% per year declines in a linear manner to 0% by 2030, then we can expect about 260,000 fatalities by 2030. Neither of these projected dates (2042 and 2030) can be accepted as road safety goals for the country.

There is definitive pattern of increase of Road Traffic Accidents which, collaborates to different comes. The analysis of different factors in relation to cause and Hospital care may give definite idea towards reducing the incidence of Road Traffic Accident.

Multifactorial pattern of Road traffic accidents has to be understood and multifaceted approach to the problem is probably key to success in reducing the incidence of Road Traffic Accident.

Conculusion:-
Inspite of better technical advoumt in field of Road Constrction , Mordevization of vehicles and safty features, the incidenase of Road Traffic Accident is on the size.

This increase can be attributed following factures:-
- Increase of Road load.
- Increase in speed
- Negligenceon part of citizens
- Careless driving
- Tired drivers
- Breaking Traffic rules
- Intoxication
- Poor Law enforement
- Unawareness of Traffic Rules
- Thoughless and careless driving
- Stuntting on the roads
- Bad roads
- Poor weather conditions
- Poor Visibility
- Irresponsible citizins and drivers

There the reponsiblityto decure the incidence of RTA actiually depends on the people who are on the Road . Any one careless driver or Ignorant Road occpant can be the cause of serious mistap.

Future scope: This reaserch has brought forward the factors which lead to roads traffic accidents. Future researhes is the field of road safety, road manners & technological advancements will strengthen the path for road safety polocies & holistic management of road traffic accidents. Prevention, intervention & rehabilitation methodiology will be effected by the present & future research to achive the goal of safe roads and better management of trauma victims.

References

1. Koornstra, M. Prediction of traffic fatalities and prospects for mobility becoming sustainable-safe. “Sadhna - Academy Proceedings in Engineering Sciences” 32: pp. 365-396. (2007).
2. Peden M, Sminkey L. World Health Organization dedicates World Health Day to road safety. Inj Prev 2004; 10:67.
3. Gururaj G. Epidemiology of traumatic brain injuries: Indian scenario. Neurol Res 2002;24:24-28.
4. Oertel M, Kelly DF, McArthur D, Boscardin WJ, Glenn TC, Lee JH, et al. Progressive hemorrhage after head trauma: Predictors and consequences of the evolving injury. J Neurosurg 2002;96:109-116.
5. Bajracharya A, Agrawal A, Yam B, Agrawal C, Lewis O. Spectrum of surgical trauma and associated head injuries at a university hospital in eastern Nepal. J Neurosci Rural Pract 2010;1:2-8.
6. Gururaj G. Injuries in India: A National Perspective. In: Burden of disease in India: Equitable development-Healthy future. New Delhi:National Commission on Macroeconomics and Health, Ministry of Health and Family Welfare, Government of India; 2005:325-47.
7. Coronado VG, Thurman DJ, Greenspan AI, Weissman BM. Epidemiology. In Jallo E, Loftus CM, Eds. Neurotrauma and Critical Care of the Brain. Thieme, New York: Stutgart; 2009.
8. Goyal M. The correlation of CT scan and operative findings in cases of head trauma. J Indian Acad Forensic Med. 2003; 25(4): 125-132
9. Gururaj G. An epidemiological approach to prevention: Prehospital Care and rehabilitation in neurotrauma. Neurology India 1995;43:95-105.
10. Robertson LS. Injuries: Causes, control strategies and public policy.Cambridge, MA: Lesington Broks; 1983
11. Peter BarssGurdsonS.SmithSusan P.Baker Dinesh Mohan”Injury Prevention” An International Perspective Epidemiology,Survillance and Policy 1998.
12. Mohan, D., Tsimhoni, O., Sivak, M., & Flannagan, M.J. Road Safety in India: Challenges and Opportunities. UMTRI-2009-1, pp.1-57. Ann Arbor, MI, The University of Michigan Transportation Research Institute.(2009).
13. Cropper, M.L. & Kopits, E. Traffic Fatalities and Economic Growth“World Bank Policy Research Working Paper” 3035: pp.1-42. Washington D.C., World Bank. (2003).
14. Gururaj G. Road safety in India: A frame work for action copyright: NIMHANS. Bangalore: Aditi Enterprises; 2011.