

Assessment of Magnitude and Treatment Outcome of Road Traffic Accident from January 2013-January 2015 in Dilchora Referral Hospital, Diredawa Eastern Ethiopia

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Abstract

Introduction: According to WHO the increase in road transportation has placed a considerable burden on the people's lives. The pandemic of road traffic deaths and injuries is the major one. According to Ethiopian Federal Police (2008/09-2010/11) report, each year more than two thousand people die and ten thousand people injured in road traffic crashes. WHO has asserted that road traffic crashes are the leading cause of death and disablement second only to HIV/AIDS for people under 44 years. The continuing advance of motorization in many developing countries is likely to further exacerbate the problem.

Patients and Methods: All records' of 402 road traffic accident patients' were retrieved and included in the analysis. This study identified that two hundred ninety three (72.9%) were males and one hundred and nine (27.1%) female respectively with male to female ratio of 2.7:1.

Results: Majority of the patients 270 (67.2%) presented to the Hospital in less than 12hour of the accident, 120 (29.9%) of them in 12-24 hour and 12 (2.9%) presented after 24 hour of the accident. The overall length of hospital stay (LOS) ranged from 1-136 days. Two hundred and sixty-eight (67%) of RTA victims had GCS of between13-15 on admission, 86 (21.4%) had between 9-12 and 48 (12%) between3-8. Of total RTA victims 402 of them admitted in the study period 363 (90.5%) were managed as conservative while 38 (9.5%) of them were managed surgically. From 402 patients admitted 362 (90%) were alive and discharged. About 304 (75.6%) of patients were discharged improving without any sequel, 60 (15%) were discharged with some disabilities and 38 (9.4%) of them were dead of RTA.

Conclusion: Road traffic accident is an important public health problem accounting for a substantial proportion of all trauma admissions at Dilchora referral hospital. The age of RTA patients ranged from 1to 75 years old and the maximum number of patients (43%) found in 15-24 years. There was preponderance of RTA in males

Key words: RTA, Trauma, Treatment outcome

Introduction

People for centuries have been moving from place to place to pursue their day-to-day

activities. To facilitate their movement, people use different ways of transportations including road, air, water, train etc. According to World Health Organization (WHO) road transportation provides benefits both to nations and to individuals by facilitating the movement of goods and people. It enables increased access to jobs, markets, education, recreation and health

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Table 1 Socio-economic and demographic characteristics of the study patients with road traffic accident in Dilchora Referral Hospital from Jun 2013 -Jun 30,2015.

Socio-demographic characteristics		Number	Percent
Sex	M	293	72.9
	F	109	27.1
Age	0-14	62	15.4
	15-24	92	22.9
	25-35	103	25.6
	>36	73	36.1
Residence	Dire-Dawa	139	34.6
	Out of Dire-Dawa	263	65.4

care. In Africa, over 80% of goods and peoples are transported by roads and in Ethiopia road transport accounts for over 90% of freight and passenger movements in the country [1]. Road transportation has a direct connection with the day-to-day activities of people, especially in large cities where the distance to be travelled is too far to cover on foot or by bicycle within a reasonable time. According to WHO (2009), however, the increase in road transportation has placed a considerable burden on the people's lives. The pandemic of road traffic deaths and injuries is the major one. According to Ethiopian Federal Police (2008/09-2010/11) report, each year more than two thousand people die and ten thousand people injured in road traffic crashes [2].

WHO (2009) asserted that road traffic crashes are the leading cause of death and disablement second only to HIV/AIDS for people under 44 years. The continuing advance of motorization in many

developing countries is likely to further exacerbate the problem.

Owing to road transportation accidents the lives of peoples' in developing and developed cities is subject to these negative outcomes. As a result, the individuals' human security is highly threatened by RTAs that deprives their lives, health, property, etc. The problem of death and injury of road accidents is now acknowledged to be a global phenomenon with authorities in virtually all countries of the world; worried about the growth in the number of people killed and seriously injured on their roads. In the 2009 report of the WHO, Lee Jong Wouk, Director General of World Health Organization, described the situation of road traffic crashes as follows: Every day thousands of people are killed and injured on our roads. Men, women or children walking, biking or riding to school or work, playing in the streets or setting out on long trips, will never return home, leaving behind shattered families and communities.

Table-2; Frequency distribution of admission Dx of RTA cases in Dilchora Referral Hospital, from Jun,2013-jun,2015

Admission Dx	Number	Percent
Lower extremities injury	218	54.2
Head injury	120	29.8
Upper extremities injury	32	7.9
Chest & abdomen injury	12	2.9
Back & Neck injury	20	4.9
Total	402	100.00

Millions of people each year will spend long weeks in hospital after severe crashes and many will never be able to live, work or play as they used to do [3]

Road traffic accidents have been shown to be the most frequently encountered injuries seen in hospitals, so this study will assess the general magnitudes, epidemiology of admissions of patients with RTA and their treatment out come in Dilchora referral Hospital in comparison with similar studies done in other settings and countries. Road traffic accident is the current serious public health problem, especially to middle and low-income countries. Situation of road traffic accident in Ethiopia is already alarming, and the country has one of the highest numbers of fatalities per vehicle worldwide and there is only one physician per 30,000 inhabitants [4].

Patients and Methods

Study Area and Period

This study was conducted in Dilchora Referral Hospital, Dire-Dawa, which is found about 515 kms away east of Addis Ababa. Patients admitted with road traffic

accident (RTA) from, Jan1, 2013-Jan, 2015. Data was collected from March 1, 2015-April25, 2015

Study Design

The study is retrospective cross sectional study; design was used based on patients' record review for two years in dilchora referral hospital.

Source of population

All trauma patients who visited by road traffic accident, in Dilchora referral hospital in the past two years

Study Population

All patients who have admitted with RTA (road traffic accident) to Dilchora referral Hospital for surgical and orthopedic ward properly recorded for two consecutive 2 years.

Study subjects

Patient admitted with road traffic accident was selected in this study.

Table 3: Association of Independent Variables with Dependent variables Dilchora referral Hospital, 2015

Study variables		Improved	Disabled	Died
GCS	3-8	12	9	28
	9-12	55	27	6
	13-15	235	24	4
Sex	Male	224	38	31
	Female	80	22	7
Dx	Lower extremities injury	109	17	6
	Head injury	144	39	20
	Upper extremities injury	14	0	6
	Chest & abdominal injury	13	0	0
	Neck & Back injury	24	4	6
Mx	Conservative	286	47	30
	Surgical	18	13	8
Hospital stay(LOS)	<14day	59	16	4
	15-24day	201	28	30
	25-35 day	20	4	2
	>30 days	24	10	2
Duration after RTA occurred	<12hours	202	36	26
	12-24 hours	182	24	12
	>24	18	0	0

Inclusion Criteria: All patients visited to Dilchora referral Hospital after road traffic accident from Jan, 2013 to Jan, 2015 who had completed records.

Exclusion Criteria: Patients with incomplete records (absence of major variables) and Patients whose records lost from data room

Sample Size determination

All patients who are recording on registration book individual folder by the case of road traffic accident during the past two years.

Sampling technique

A systematic random sampling technique was used to select the records of the study subjects. The records of the study subjects was selected among those who had visited the hospital from Jan, 2013 to Jan, 2015. The first chart of the patient was selected by a lottery method.

Data Collection tool and Procedures

Data was collected using checklist. First the card number was recorded from in patient records at hospital that admission books and to get the main files of the patient from the card room. Next using the Medical Record number (MRN) of the patient's card we were collected from patient's card to

collect the appropriate data for the study. Finally, based on the inclusion and exclusion criteria of the study, a card which had all variables for the study was used. Then; all variables were collected from the main card information. Two BSc fourth year nursing students were the principal investigator (PI) in the process of data collections and timely supervision was under taken by the principal investigator during the data collection period.

Dependent Variable: Magnitude of road traffic accident (RTA) admissions and Treatment outcome of patients admitted with road traffic accident.

Independent Variable: Age, sex, residence, admission diagnosis, time of admission and discharge, length of hospital stay, GCS of the patient.

Data Processing, Analysis and Interpretation: After the collection of data is completed, the data was grouped accordingly to the variables. The collected data was analyzed accordingly with manual calculator. Then the result was presented by percentage, table chart and numbers.

Ethical Consideration: Official letter was written from the university to Dilchora Referral Hospital and permission was obtained from the officials. The information found from the patient was kept secured and was used for this study purpose only.

Result

Socio-economic and demographic characteristics of the study patients

All records' of 402 road traffic accident patients' were retrieved and included in the analysis. This study identified that two hundred ninety three (72.9%) were males and one hundred and nine (27.1%) female respectively with male to female ratio of

2.7:1. About 63.9% of patients were found to be in young age group between 1 to 35 years old. From these, peak age group for the highest incidence of RTA is between 15 and 24 years old. The age of the patients ranges from 1 to 75 year. The median and mode of age of the study subjects were 15 and 24 years respectively. Only hundred thirty-nine of (34.6%) patients with RTA were from Dire Dawa while two hundred and sixty three (65.4%) were outside Dire Dawa (Table 1).

Clinical Characteristics

Majority of the patients 270 (67.2%) presented to the Hospital in less than 12 hour of the accident, 120 (29.9%) of them in 12-24 hour and 12 (2.9%) presented after 24 hour of the accident.

And according to this study, only 44 (11%) of the patients came with referral and the larger number of patients 358 (89%) visited the hospital directly. The majority of patients 252 (62.7%) were admitted to orthopedic ward, 150 (37.3%) admitted to surgical ward. Musculoskeletal (Lower extremities) and head injury were most common region of the body injured accounting 218 (54.2%) and 120 (29.8%) of cases (Table 2).

Clinical outcome of RTA victims

The overall length of hospital stay (LOS) ranged from 1-136 days. Two hundred and sixty-eight (67%) of RTA victims had GCS of between 13-15 on admission, 86 (21.4%) had between 9-12 and 48 (12%) between 3-8. Of total RTA victims 402 of them admitted in the study period 363 (90.5%) were managed as conservative while 38 (9.5%) of them were managed surgically.

From 402 patients admitted 362 (90%) were alive and discharged. About 304 (75.6%) of patients were discharged improving

without any sequel, 60 (15%) were discharged with some disabilities and 38 (9.4%) of them were dead of RTA. Patients with GCS of 3-8 were more likely to die when compared to patients those who have GCS of above 8 (95% CI, p-value=0.000). The study also shows that patients who have managed surgically have less likely to die than those who have managed surgically (p-value=0.000)(Table-3).

Discussion

The study shows that road traffic accidents was the major cause of musculoskeletal (Lower extremities) and head injury in the study population. Road traffic accident is an expanding major public health problem and is the leading cause of morbidity and death in many developing countries, including Ethiopia. Thus, efforts should be made by all concerned authorities, especially road authority and traffic police. Targeted information dissemination should be given to the public using mass media.

In the present study 63.9% were young, with peak age of incidence between 15-24 the age ranged from 1-75 year. This compares well with the finding of Chayla *et al*, 2012 [5]. This age group represents the economically active age and portrays an economic loss for both the family and the society. The reason for the high incidence of head injuries in this age group reflects their high activity levels and participation in high-risk activities. Male predominance in the present study is due to their increased participation in day to day outdoor activities and also in high-risk activities. This study identified that males were predominantly affected with RTA than females, i.e 293 (72.9%) and 109 (27.1%) respectively with male to female ratio of 2.7:1 similar to that reported earlier [5].

In this study system musculo-skeletal (Lower extremity) injury accounted for 54.2% of all trauma patients admitted to our hospital which are similar to other studies [6]. The pre-hospital care of trauma patient has been reported to be the most important factor in determining the ultimate outcome after the injury [6]. Few of our patients had pre-hospital care; the majority of them were brought in by relatives. In this study, 67.2% of RTA victims were brought to hospital in less than 12 hours which is critical time after pre-hospital care.

This study also found that find out that majority of the patients (62.7%) were admitted to orthopedic ward that resulted in longer stay compared to those admitted to surgical ward. The overall length of stay (LOS) in this study was found to range between 1and 136 days which is similar finding with study done in Rwanda in teaching Hospital [7].

Prolonged LOS in our study is attributable to presence of major trauma patients in large number of patients majority of these had fractured bones that took longer time to heal. The length of hospital stay (LOS) has been reported to be an important measure of morbidity among trauma patients. Prolonged hospitalization is associated with an unacceptable burden on resources for health and undermines the productive capacity of the population through time lost during hospitalization and disability [8].

This study shows that 32.7% of RTA patients were admitted with head injury. This was the second common cause of admission in our patients. Road traffic accidents have been reported to be the commonest cause of head injuries in most studies as supported by this study [9-14]. This may be attributed to recklessness and negligent driving, poor maintenance of vehicles, driving under the influence of

alcohol or drugs, complete disregard of traffic rules and laws, and inappropriate use of street by pedestrians [9-14].

The GCS of the 12.2% patients in our study was between 3-8. Of these, 62.7% eventually died. Results suggest that patients with low GCS (3-8) are highly liable for bad outcome. Other studies also reported on similar outcomes [15]. Majority (90.3%) of the patients in this study were managed conservatively while 9.7% underwent surgery, this finding is found to contradict with study done in North West Tanzania where by majority of RTA patients admitted were treated surgically [16].

This study identified that RTA was responsible for 38(10%) deaths and 60(15%) cases of disability. This finding compatible with other studies that show that RTA is responsible for 85% of annual deaths and 90% of the disability-adjusted life years(DALY) [17].

Limitation of the Study

This is a hospital based study with a sample size of 402 patients that makes it difficult to generalize the conclusion, the sample may not be representative of the population and the nature of research is exploratory rather conclusive. Due to poor documentation of patient information and data management system in the institution (hospital) some necessary information were not found, and this is a major lacunae. Because of few studies done on RTA particularly in low income countries and in this set up, the literatures related to this study from developing countries is also little.

Conclusion

Road traffic accident is an important public health problem accounting for a substantial proportion of all trauma admissions at Dilchora referral hospital. The age of RTA

patients ranged from 1 to 75 years of age and the maximum number of patients (43%) are found to be of 15-24 years. There was preponderance of RTA in males.

RTA continues to be the major etiological factor and causes for 10% death and 15% of disabilities, the commonly affected victims are young adult males in their productive and reproductive age group. Urgent preventive measures targeting at reducing the occurrence of RTAs is necessary to reduce the problem in this region.

Recommendations

The hospital should optimize the cares that is currently being given to head injury patients and long bone fracture (conservative, surgical) to improve outcomes.

The hospital should organize primary health facilities about pre-hospital care and timely referral linkage of trauma patients.

CT scan and MRI (magnetic resonance image) should be available in the hospital this can surely improve the management of head injury patients.

The road authority and traffic polices are strong rule and regulation of drivers, then other stakeholders should take an appropriate measure to reduce the problem caused by RTAs in the region.

Appropriate collection and recording of patient data is essential. Setting up a Trauma register may solve some of the problems.

Ethical Consideration

The consent to publish the finding was obtained from Dilchora Hospital and Haramaya University.

Competing interests

The authors declare that there are no competing interests.

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Authors' contributions

LN- took the lead through the development of the proposal, data collection supervision, check up of the collected questionnaire and analysis as well as through write up of the paper.

GEGS-, also had main contribution in analysis and write up of the paper.

JM -contributed in cleaning and analysis of the data.

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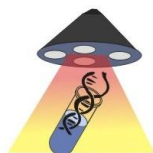
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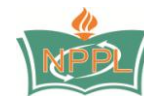
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