

# Road Traffic Accidents and the Traumatic Brain Injuries: A Cross- Sectional Study.

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## Abstract

**Background:** Street traffic accidents were a main community healthiness problematic particularly in low and middle-income countries, head injuries were found to be the most common injuries. Objectives: to identify the relationship of road traffic injuries with different associated factors.

**Methodology:** This was a cross sectional study conducted on 500 Road Traffic Accidents victims admitted to the emergency unit at Al-Sader Teaching General Hospital in Al Najaf Holy province- Iraq. Data collection was done using a pretested questionnaire. A medical team including neurosurgeon, medical, and orthopedics to identify the types (pattern) of cranio-cerebral injuries evaluated outcomes of the injury cases.

**Results:** Most of the victims are males in their productive age, motorcycle is the most common cause of accidents, head injuries constituted the highest proportion (39.6%), the mortality rate was (13.6%), and unhealthy behaviors during driving were dominated.

**Conclusion:** Cerebral contusions and skull fractures were the most common lesions among head injuries and trauma brain injuries victims.

**Keywords:** Road Traffic Accidents, traumatic brain injuries, driving behavior–Al-Najaf province Iraq.

## Introduction

Globally, nearly 3 400 people die on the world's roads every day. Tens of millions of people are injured or disabled every year. WHO works to raise the profile of the preventability of road traffic injuries<sup>(1)</sup>. WHO article guesses that 1.9 million individuals in the world die yearly by 2020<sup>(2)</sup>, deaths due to street traffic damages occur in little and middle-income nations<sup>(3,4)</sup>. Road traffic crashes cost most countries 3% of their gross domestic product <sup>(5)</sup>. In 2020, the 3<sup>rd</sup> reason of death and morbidity. 50% of the dead are persons with in their productive age <sup>(6)</sup>. The straight and unintended prices advanced in developing republics likened to those in developed republics<sup>(7)</sup>. Rendering to WHO, the

typical yearly mortality rate due to street traffic damage in Iraq is 44.7 (consistent age mortality rate per 100,000 people) <sup>(8)</sup>. Road traffic injuries cause estimated 700 deaths among young people every day <sup>(9)</sup>. Head injuries due to Road Traffic Accidents is a recognized health problem causing death and disability among the victims, the head being the most vulnerable part of the body that is why cranio-cerebral injury is on the top<sup>(10-12)</sup>. The objectives of this study are to identify the relationship of road traffic injuries with different associated factors, and to assess the morbidity and mortality among road traffic victims admitted to the emergency unit of Al- Sadder hospital-AL-Najaf province- Iraq during the year 2016.

## Methodology

Approval of research ethical committee of Al- Najaf health directorate was obtained; verbal consents were taken from patients or their companions after explaining the objective the study. This study was a cross-sectional study conducted in Al –sadder medical city in Al-Najaf province – Iraq, the duration of this study started from

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the beginning of September –to the end of November 2016. The study group included all patients who were admitted to the emergency unit in Al-Sader general hospital who were injured due to Road Traffic Accidents. Exclusion criteria of this study include victims of Road Traffic Injuries (RTIs) that took place in other provinces and admitted for treatment in this general hospital; any RTI occurred on the road without involvement of automobile (e.g. a person falling due to slipping on the road and causing injury) or injury involving not moving vehicle (e.g. when persons injured while washing or repairing a vehicle) <sup>(13)</sup>. Interviewing of patients and or their companions was done by the research team using pretested questionnaire which included: demographic information (age, gender, educational level..etc.), site of injuries, time of accident, driving behavior (having driving license, wearing seat belt and wearing helmets for motorcyclists). Data were completed by reviewing the records of accidents surveillance program and forensic department records. Outcomes of the injury cases were evaluated by a medical team including neurosurgeon, medical, and orthopedics to identify the types (pattern) of cranio-cerebral injuries through Computer Tomography findings like skull fractures, parenchymal injuries, intracranial hemorrhages, and discharge outcome (alive or death). and calculating the case fatalities together with the proportionate mortality ratios through following up cases during the period of the study. Data were analyzed

by using descriptive presentation contain classical Chi-square to test association between the variations by using SPSS version 21 The  $P \leq 0.05$  is considered statistically significant.

### Results

Table (1) explains that male to female ratio equal to 5:1 and most of victims in age group (20-29 years). Males outnumbered significantly females  $p < 0.001$ .

Table (2) reveals that one fourth of the victims are illiterates and about two thirds of them are below the primary school level.

Table (3) shows that the main vehicles causing RTIs in Al-Najaf province was caused by motorcycle (30%) followed by private cars (29%).

Table (4) depicts the time of occurrence of accidents; the highest rate of accidents took place between (9-11 am).

Table (5) shows that out of 217 injured drivers only (29,1%) have driving license. Among 126 drivers accepted to answer the question of wearing seat belt (9.5%) use the seat belt regularly, while none of the (98) motorcycle drivers (0%) mentioned that they used helmet during driving. Table (6) explains that the main site of injury is head (39.6%).

**Table (1) Distribution of Road traffic injuries by age and gender.**

Age Group (Year)	Male		Female		Total		
	No.	(%)	No.	(%)	No.	(%)	
1-9	50	(11.9)	14	(17)	64	(12.8)	sig <0.001
10-19	103	(24.6)	11	(13)	114	(22.8)	
20-29	113	(27)	15	(18)	128	(25.6)	
30-39	73	(17.4)	10	(12)	83	(16.6)	
40-49	44	(10.5)	11	(13)	55	(11)	
50 and more	35	(8.6)	21	(27)	56	(11.2)	
<b>Total</b>	<b>418</b>	<b>100</b>	<b>82</b>	<b>100</b>	<b>500</b>	<b>100</b>	

Male:Female Ratio = 5:1

**Table (2) Distribution of road traffic injuries by educational Levels**

Academic Level	Male		Female		Total		
	No.	(%)	No.	(%)	No.	(%)	
Illiterate	88	(22.9)	27	(35.5)	115	(25)	Chi-Square=13.018 Df=4 Sig.(2-side)=.011
Elementary	173	(45.2)	26	(34.2)	199	(43.2)	
Intermediate	63	(16.4)	8	(10.5)	71	(15.4)	
Secondary	32	(8.3)	7	(9.3)	39	(8.5)	
College	28	(7.2)	8	(10.5)	36	(7.9)	
<b>Total</b>	<b>384</b>	<b>(100%)</b>	<b>76</b>	<b>(100%)</b>	<b>460</b>	<b>(100%)</b>	

**Table (3): Frequency distribution of Road traffic injuries by types of vehicles causing injuries.**

Type of cars	No.	%	
Taxi	112	(22)	Chi-Square=230.392 Df=5 Sig<0.001
Private car	145	(29)	
Bus	70	(14)	
Lorry	22	(4.4)	
Motorcycle	148	(30)	
Other	3	(0.6)	
<b>Total</b>	<b>500</b>	<b>(100%)</b>	

**Table (4) Distribution of Road traffic injuries by Time of occurrence of accidents**

Time	No.	%	
6-8am	102	(20.4)	Chi-Square=173.728 Df=7 Sig<0.01
9-11am	113	(22.6)	
12-2pm	102	(20.4)	
3-5pm	63	(12.6)	
6-8pm	46	(9.2%)	
9-11pm	39	(7.8%)	
12-2am	5	(1%)	
3-5am	30	(6%)	
<b>Total</b>	<b>500</b>	<b>(100%)</b>	

**Table (5): Distribution of Road traffic injuries of drivers according to having driving license, and wearing protection devices**

Legal Behavior	Yes		No		Total		
	No.	(%)	No.	(%)	No.	(%)	
License	63	(29.1)	154	(70.9)	217	(100%)	Chi-Square=52.667 <sup>c</sup> Df=2 Sig<0 .001
Wearing seat	12	(9.5)	114	(90.5)	126	(100%)	
Wearing helmet	0	(0%)	98	(100)	98	(100%)	

**Table (6): Distribution of Road traffic injuries by site of injury**

Site of injury	No.	(%)	
Head	198	(39.6)	Chi-Square=77.264 Df=3 sig.= .000
Upper limb	115	(23)	
Lower limb	127	(25.4)	
Other	60	(12)	
<b>Total</b>	<b>500</b>	<b>(100%)</b>	

## Discussion

RTIs are the leading cause of injuries, account for 27% of the total injury and violence mortality in the Eastern Mediterranean Region<sup>(14)</sup>. The current study depicts that males are the predominant victims and in their productive age, these findings are similar to the findings of other studies in Iraq<sup>(15,21)</sup> and in other countries<sup>(22- 28)</sup>, this could be explained by the fact of high occupational exposure of males to road using and the lack of road safety in the province together with the congested roads of this holy city especially during religious visiting events. Most of the victims have low levels of educations this finding goes in line with other studies<sup>(18,19)</sup>. This finding is also similar to other study conducted in Yazad-Iran<sup>(28)</sup>. The majority of RTI occurred among motorcyclists this finding agrees with the findings of other study conducted in Yemen<sup>(25)</sup> and in Nepal<sup>(27)</sup>, this study identifies that no motorcyclists used helmets, while in a study conducted in Kenya helmets were used by less than one third of motorcycle drivers<sup>(29)</sup> motorcyclists not wearing this protective device are especially vulnerable for severe head injuries<sup>(30)</sup>. The majority of RTIs took place in the daytime mainly at 9 to 12am and 12am to 2pm this finding is similar to a study conducted In Iran<sup>(31)</sup>The most frequently injured body regions as reported in this study was the head, followed by lower extremities this finding is in contrast with findings of other researchers<sup>(32)</sup>, but it goes with the finding of other studies<sup>(27,33)</sup>. Several studies reported that head injury was found to be most common injuries during traffic accidents<sup>(34)</sup>, being 42.1% making a substantial contribution to RTA cases<sup>(35)</sup>, the main reasons of the fatality is severe traumatic brain injury (TBI) produced by head dullpowers<sup>(36,37)</sup>. In low- and middle-income countries 43% of individuals with TBI that cause by cars accidents<sup>(39)</sup>. Although numerous studies have been done, the consequence of skull fracture on TBIs has not been obviously assumed<sup>(14)</sup>. In the current study the types of lesions are; contusions

followed by skull fractures then lacerations this findings are in contrast with report of Pathak et al<sup>(34)</sup> who found that contusion constitutes 5.16% and skull fracture 22.7%, this difference may be related to difference in the severity of traumas due to RTA in our study or may be due to the poor use of the seat belts and helmets. The current study shows that less than one third of drivers have driving license and less than (10%) of drivers wear seatbelts regularly, findings indicate bad road behavior and they are less than that reported by other studies<sup>(11,27,33)</sup>. As a result of the enactment of the seat belt law, in accordance with suggestions from many studies, a significant drop in certain types of injuries<sup>(32)</sup>.

Most of the victims are males in their productive age, motorcycle is the most common cause of accidents, and head injuries constituted the highest proportion, unhealthy behaviors during driving dominated.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** None

**Funding:** Self-funding

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