A PROSPECTIVE STUDY ON ROAD TRAFFIC ACCIDENT CASES ARRIVED AT MENOUFIA UNIVERSITY HOSPITAL OVER ONE YEAR

*** Fatma Shaban Kandeel**, ***Situhom Elsayed Elagamy**
Forensic Medicine and Clinical Toxicology Department, Faculty of Medicine- Menoufia University.
Corresponding author: Situhom Elsayed Elagamy (situhommohamed36@gmail.com) (Tel. 01007062105) Tala, Menoufia, Egypt.

ABSTRACT

Background: Road traffic accidents are a major cause of disability and death globally. The problem is increasing in developing countries. **Objectives:** This study was designed to study cases of road traffic accidents (RTA) treated at Menoufia University Hospital (MUH) in Menoufia, Egypt, in the period from first of July 2016 to end of June 2017. **Patients and Methods:** Data from 2080 cases of RTAs were analyzed. Data included socio-demographic information, type of vehicle, type of victims, type of injuries, and outcome of these cases. **Results**: The highest represented age group was from 15 to 30 year (43.8%). Majority of cases were males (81.6%). 64.1% were from rural areas. Majority of cases were due to motor car accidents (62.4%). Pedestrians were the most common victims (54.2%) followed by passengers (31.4%).75.9% of the victims suffered from abrasions and/or contusions and 48.6% from lacerations. According to legal classification more than half of the cases suffered from dangerous injuries (53.3%), 37.4% simple and only 9.3% had fatal injuries. Of the survivors, 79.6% were cured and 9% were cured with permanent infirmity. **Conclusion:** Road traffic accidents are definitely a serious problem in our setting and lead to a raising morbidity and mortality rates. Substances of abuse are a probable risk factor. **Recommendations**: RTAs need effective rapid preventive measures to decrease its incidence. Strict control on substances of abuse is also needed.

Keywords: Road, Traffic, Accidents, Injury, Motor.

INTRODUCTION

Road traffic accidents are a major cause of disability and death globally **(Lagarde 2007; Nantulya, Peden, et al., 2004; Reich 2000)**. Its injuries and fatalities are a vital public health issue that needs serious measures for effective control and prevention **(WHO report 2013)**.

Information from the Global status report on road safety 2015 about the total number of road traffic deaths from 180 countries, noted that it has plateaued at 1.25 million per year, with the highest fatality rates in low-income countries **(WHO report 2015)**. Per 100,000 of population, the mortality rate for 2013 in Yemen was 15.17, 14 for Qatar and 13.2 for Egypt. However these rates are lower than reported in other countries as Iran (34.1), Iraq (31.5), Sudan (25.1), and Saudi Arabia (24.8) **(WHO report 2014)**.

MATERIAL & METHODS

A prospective study of all road traffic accident (RTA) cases treated at emergency department of Menoufia University Hospital (MUH) in the period from the 1st of July 2016 to the end of June 2017 was conducted.

After obtaining ethical approval from the MUH Ethical Committee and the director of the Menoufia Poison Control Center (MPCC), data were collected including age, sex, residence, educational level, type of victim, type of vehicle, method of arrival, periods of the day, seasons of the year, type of injury (external injuries and finding in investigations), severity of injuries, site of injury, place of treatment, outcome, type of permanent Infirmity and cause of death.

Legal classification of injuries (based on amount of damage) was used to categorize severity of injuries into simple or slight, dangerous and fatal injuries **(Krishan, 2011)**.

Simple injuries are wounds that heal in a period less than 20 days without leaving permanent infirmity or disfigurement.

Dangerous injuries are wounds which heal in a period greater than 20 days with or without leaving permanent infirmity, less than 20 days and leave permanent infirmity or disfigurement, or any injury which endangers patient life or causes severe body pain or unable to follow his ordinary works for a period of 20 days.

Fatal injuries are those which cause death either shortly after the RTA due to wound itself or later due to its complications.

Blood samples were collected from drivers and motor cyclists (who gave consent) for screening tests of alcohol and urine for other substances of abuse after explaining to them that they are for research purpose.

Qualitative immunoassay test was used for detection of common substances of abuse according to the method described by McBay, 1987 and alcohol detection by qualitative dichromate method described by **Moffat et al. (2000)**.

Consents were taken from the cases or from their legal guardians in patients with disturbed consciousness or who were under of the age of consent for medical examination. Consent was also were taken from the drivers and motor cyclists before sample collection.

The collected data were tabulated and analyzed using SPSS version 17.0 **(Elliott and Woodward, 2007).**

Descriptive statistics as percentage were also used. Associations were analyzed using Chi-square test ($\chi 2$). Statistical significance were considered when P-value of < 0.05 and highly significant when <0.001.

RESULTS

The total number of cases was (2080) case. The highest represented age group was from 15 to 30 year (43.8%) followed by age groups of 31-45years, 46-60 year, less than 15 years, (20.5%, 19.8% and 11.5% respectively) and the least was those over 60 years (4.4%). Majority of cases were males (81.6%). 64.1% were form rural areas and 35.9% were from urban areas. Victims were mainly below secondary education or illiterate (37.6% and 25.7% respectively) followed by secondary and high education (19% and 12.1% respectively) and 5.6% were below school age **(Table1)**.

The majority of cases were due to four wheels motor vehicles accidents (62.4%) followed by three wheel and motor cycle (26.9% and 10.7% respectively). Pedestrians were the most common victims (54.2%) followed by passengers, motor cyclists and lastly drivers (31.4%, 7.6% and 6.8% respectively) **(Figure1)**.

As regards relation between types of victims in different age groups, the results revealed that percent of victims < 15 years, 31-45 and over 60 years old

were more commonly pedestrians in relation to other victims (15.7%, 31.6% and 6.3% in pedestrians versus 7.8%, 8% and 3% in passengers, 5.7%, 8.3% and 0% in motor cyclists and 0.7%, 4.2% and 1.4% in drivers respectively). While percent of victims who were from 15 to 30 years old were more commonly motor cyclists (75.2% in motor cyclists versus 60.8% in passengers, 57.7% in drivers and 27.7% in pedestrians) and finally percent of victims aged 46-60 years were more commonly drivers (35.9% in drivers versus 20.4% in passengers, 18.7% in pedestrians and 10.8% in motor cyclists). And these differences were statistically highly significant **(Table2)**.

On external examination of all cases in ER, 75.9% of them were found to suffer from abrasions and/or contusions, 48.6% from lacerations and 1.8% from crush wounds. Regarding findings in imaging investigations; 40.5% suffered from fractures. Intracranial hemorrhage was found in 13.3%, haemothorax/ pneumothorax in 10.8%, intra-abdominal hemorrhage in 3.65%, organ injury in 3.6% and nerve/ arterial injuries in 1.97% .Limbs were the commonest site of injury (70.04%). About two thirds had injuries in the head & neck (65.5%), while back/ spine, chest and abdomen/pelvis were 19.5%, 19.1%, 9.7% respectively **(Table 3)**.

There is a highly significant relationship between type & site of injury and victim status as P value<0.001; where there was more frequency of lacerations (73.2%), fractures (60.5%), injuries in head (94.9%) including intracranial hemorrhage (49.04%) and limb injuries (93.6%) in motor cyclists. While there was more prevalence of abrasions/contusions (77.9%), crush injuries including amputations (3.1%), nerve/arterial injury (3.2%), and abdomen/pelvis injuries (14.1%) including intra-abdominal hemorrhage (6.2%) and back/spine injuries (24.8%) in pedestrians. Percent of chest injuries (58.4%) including hemothorax/pneumothorax (52.8%) and organ injury (12.7%) were higher in drivers than other types of RTA victims **(Table4)**.

57.6% of the victims came to emergency room by ambulance while the remaining was brought by others including relatives (42.40%).The majority of cases were admitted to different hospital departments(60.4%) 39.9% of them were admitted to orthopedic department , 24% neurosurgery, 18.3% cardiothoracic, 12.9% general surgery, and 4.9% to other departments. 25.2% of cases were discharged after management in ER without admission and 14.4% of cases needed intensive care unit admission (ICU) **(Figure 2)**.

Occurrence of RTAs was throughout the day with a peak at morning & early afternoon (9am-3pm) (45.20%) followed by late afternoon &evening (3pm-9pm) (37.5%). Only 17.3% occurred at night and early morning (9pm-9am).There was a seasonal variation regarding occurrence of RTAs, as they were most commonly occurred in summer and spring (31.7% and 29.3% respectively) followed by autumn (20.8%) and lastly winter (18.2%) **(Figure3)**.

According to legal classification more than half of the cases suffered from dangerous injuries (53.3%), 37.4% simple and only 9.3% had fatal injuries **(Figure4)**.

Screening for substances of abuse was done for 156 cases (92 of drivers and 64 of motor cyclists) after taking consent from them or from their guardians. 31.5% of drivers were

positive for cannabinoids, 20.7% positive for tramadol, 3.3% positive for benzodiazepines and 1.1% positive for alcohol. Screening of 64 cases of motor cyclists; 26.6% of them were positive for cannabinoids, 32.8% were positive for tramadol, 3.1% positive for benzodiazepines and 3.1% positive for alcohol **(Table 5)**.

As regards outcome of cases, 79.6% were cured, 9% were cured with permanent infirmity, 2.1% were discharged against medical advice and the death rate was 9.3%. Cases of permanent infirmity were most commonly in the form of limitation of movement (68.3%) followed by amputation, spleenectomy, craniotomy flap (12.9%, 9.1% and 8.1% respectively) and the least was paraplegia (1.6%). Head injury was the main cause of death in about 52.6 % of dead cases, followed by multiple injuries (17.5%), while thoracic and abdominal injuries were responsible for 16% and 8.8% respectively. The least were limbs injuries (5.1%) **(Table6)**.

There were highly statistically significant differences of outcomes of different types of victims. As more drivers were cured with permanent infirmity (16.2%) in relation to other victims (9.5% in passengers, 8.8% in pedestrians and 1.3% in motor cyclists). Death rate was higher in drivers (14.8% in drivers versus 12.1% in pedestrians, 10.2% in motor cyclists and 3% in passengers) **(Table7)**.

Table (1): Distribution of RTAs victims according to age, gender, residence and educational level.

		N	%
Age	<15	238	11.5
	15 - 30	910	43.8
	31- 45	427	20.5
	46- 60	412	19.8
	>60	93	4.4
Gender	male	1698	81.6
	female	382	18.4
Residence	Rural	1334	64.1
	urban	746	35.9
Educational level	Below school age	116	5.6
	Illiterate	335	16.1
	Below secondary education	881	42.4
	Secondary education	496	23.8
	High education	252	12.1

Table (2): Chi-square (X^2) analysis between type of victims in different age groups

Age groups	Drivers		Pedestrians		Passengers		Motor cyclists		P value	chi square
	N	%	N	%	N	%	N	%		
<15 years	1	0.7%	177	15.7%	51	7.8%	9	5.7%	49.81	<0.001
15-30	82	57.7%	313	27.7%	397	60.8%	118	75.2%	268.71	<0.001
31-45	6	4.2%	356	31.6%	52	8%	13	8.3%	169.9	<0.001
46-60	51	35.9%	211	18.7%	133	20.4%	17	10.8%	32.16	<0.001
>60	2	1.4%	71	6.3%	20	3%	0	0%	20.56	<0.001
Total	142	100	1128	100	653	100	157	100		

Table (3): Distribution of RTA victims according to Type and Site of Injury (N =2080).

			N	%
Type of Injury	**External Injuries**	Abrasions &/or contusions	1578	75.9
		Lacerations	1011	48.6
		Crush wound	38	1.8
	Findings in imaging investigations	Fractures	843	40.5
		Nerve/ arterial injuries	41	1.97
		Intracranial hemorrhage	277	13.3
		Haemothorax/ Pneumothorax	224	10.8
		Intra-abdominal hemorrhage	76	3.65
		Organ injury	75	3.6
Site of Injury			**N**	**%**
		Head& Neck	1363	65.5
		Chest	397	19.1
		Abdomen/Pelvis	201	9.7
		Back/Spine	405	19.5
		Limbs	1457	70.04

Table (4): Chi-square (X2) analysis of Type and Site of injury in relation to victim status.

Type of Injury	**Victim Status**								**Chi square**	**p. value**
	Driver		**Pedestrians**		**Passengers**		**Motor cyclist**			
External Injuries	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**		
Abrasions&/or Contusions	98	69.01%	879	77.9%	494	75.7%	107	68.2%	11.37	<0.05
Lacerations	64	45.1%	692	61.3%	140	21.4%	115	73.2%	305.1	<0.001
Crush injuries	2	1.4%	35	3.1%	1	0.15%	0	0.0%	23.50	<0.001
Findings in imaging investigations	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**		
Fractures	69	48.6%	585	51.9%	94	14.4%	95	60.5%	274.97	<0.001
Nerve/Arterial Injury	3	2.1%	36	3.2%	1	0.15%	1	0.6%	21.32	<0.001
Hemothorax/ pneumothorax	75	52.8%	126	11.2%	22	3.4%	1	0.6%	315.44	<0.001
Intracranial hemorrhage	23	16.2%	158	14.0%	19	2.9%	77	49.04%	236.36	<0.001
Intra-abdominal hemorrhage	4	2.8%	70	6.2%	2	0.3%	0	0.0%	47.89	<0.001
Organ Injury	18	12.7%	44	3.9%	3	0.45%	10	6.4%	55.94	<0.001
Site of Injury	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**		
Head / Neck	127	89.4%	935	82.9%	152	23.3%	149	94.9%	762.5	<0.001
Chest	83	58.4%	256	22.7%	45	6.9%	13	8.3%	226.7	<0.001
Abdomen/ Pelvis	12	8.5%	159	14.1%	17	2.6%	13	8.3%	63.25	<0.001
Back/ Spine	11	7.7%	280	24.8%	97	14.7%	17	10.8%	49.41	<0.001
Limbs	114	80.3%	974	86.3%	222	34%	147	93.6%	596.05	<0.001

Table (5): Toxicological screening for some drivers and motor cyclists.

Substance of abuse	**Drivers N=92**				**Motor cyclists N=64**			
	Positive		Negative		Positive		Negative	
	N	%	N	%	N	%	N	%
Cannabinoids alone or with other substances	29	31.5	63	68.5	17	26.6	47	73.4
Tramadol alone or with other substances	19	20.7	73	79.3	21	32.8	43	67.2
Benzodiazepines alone or with other substances	3	3.3	89	96.7	2	3.1	62	96.9
Alcohol	1	1.1	91	98.9	2	3.1	62	96.9

Table (6): Distribution of road traffic accidents victims according to outcome and type of permanent infirmity.

		N	%
Outcome	Complete cure	1656	79.6
	Cured with permanent infirmity	186	9
	Discharged against medical advice	44	2.1
	Died	194	9.3
	Total	2080	100
Type of permanent Infirmity	Limitation of movement	127	68.3
	Amputation	24	12.9
	Splenectomy	17	9.1
	Craniotomy flap	15	8.1
	Paraplegia	3	1.6
	Total	186	100
Cause of death	Head injury	102	52.6
	Multiple injuries	34	17.5
	Thoracic injury	31	16
	Abdominal injury	17	8.8
	Limb injury	10	5.1

Table (7): Chi-square analysis of different types of victims in relation to their outcomes.

Outcome	**Drivers**		**Pedestrians**		**Passengers**		**Motor cyclists**		**P value**	**chi square**
	N	%	N	%	N	%	N	%		
Cured	98	69%	849	75.3%	571	87.4%	138	87.9%	54.27	<0.001
Cured with PI	23	16.2%	99	8.8%	62	9.5%	2	1.3%	209.86	<0.001
Died	21	14.8%	137	12.1%	20	3.1%	16	10.2%	46.04	<0.001
Discharged against MA	0	0%	43	3.8%	0	0%	1	0.6%	34.56	<0.001
Total	142	100	1128	100	653	100	157	100		

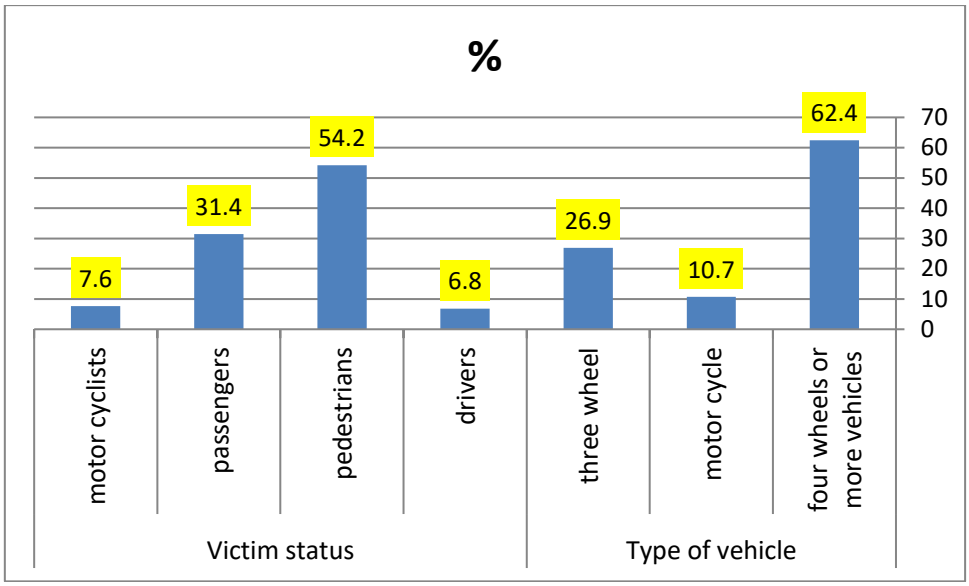

Figure (1): Distribution of road traffic accidents victims according to victim status and type of vehicle.

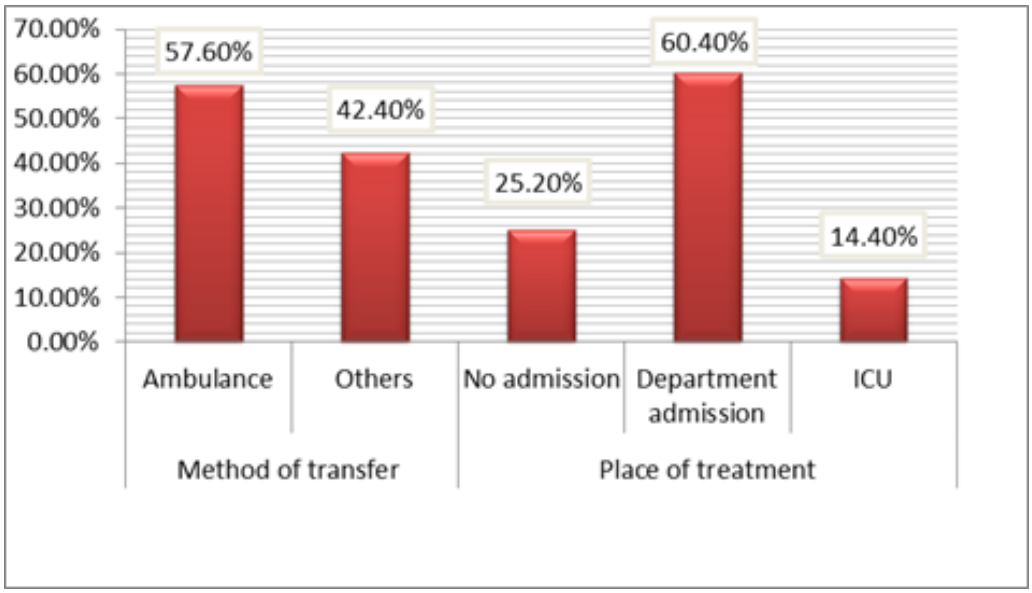

Figure (2): Column chart of distribution of RTA victims according to Method of transfer, and Place of treatment.

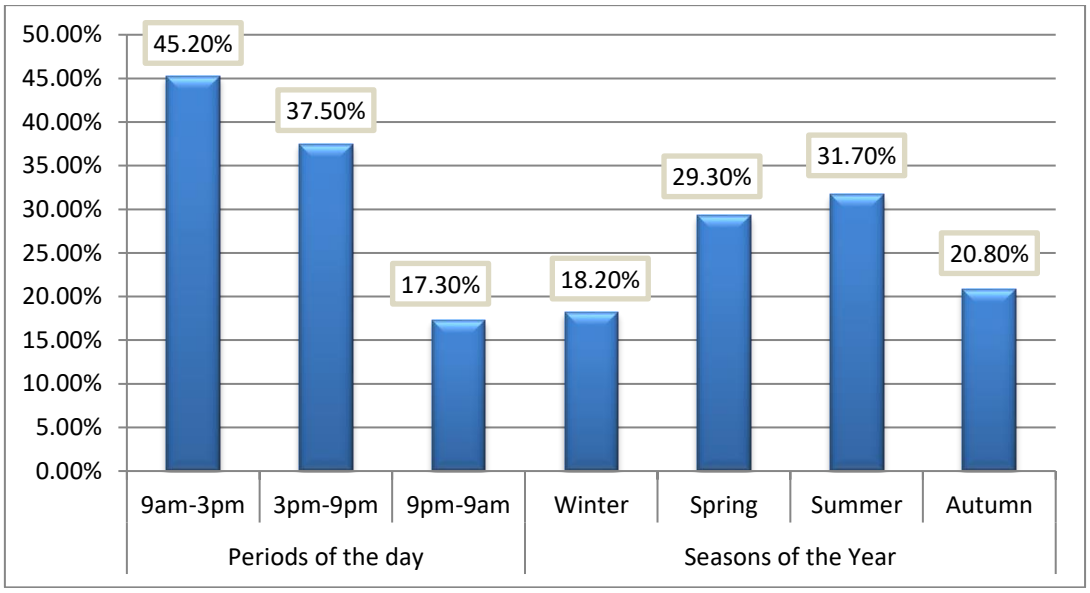

Figure (3): Column chart of distribution of RTA victims according to periods of the day and seasons of the year.

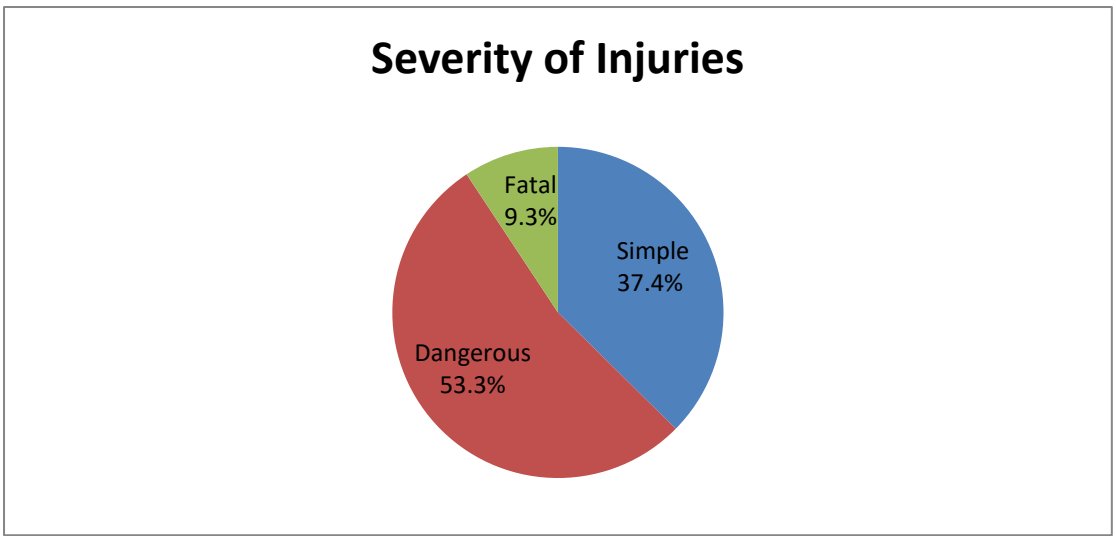

Figure (4): Pie Chart of distribution of RTA victims according to Severity of Injuries (Legal classification).

Figure (5): A photo of adult female with history of RTA (run over injury) by a bus showing crushing of lower part of both lower limbs.

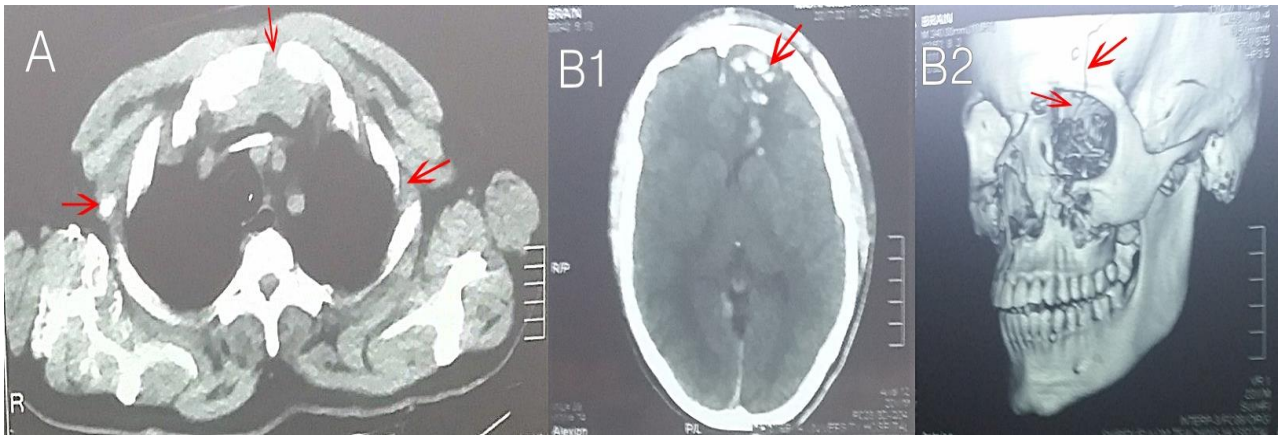

Figure (6):

A- CT chest of male patient (driver) 50 years old with history of RTA showing comminuted fracture of the sternum and ribs of both side arrows.

B1- CT brain of male patient (motorcyclist) 19 years old with history of RTA showing multiple hemorrhagic brain contusions involving left frontal lobe (arrow) and diffuse brain edema.

B2- 3D CT skull of the same patient showing fracture of left frontal bone and bone of left orbit (arrows).

DISCUSSION

Age groups:

The present results noted that patients aged from 15 to 30 and 31 to 45 were the most common victims of RTAs (43.8% and 20.5% respectively). This is usually the age of secondary and university school students and it is also the age of productive workers who are more involved in heavy traffic.

These results were similar to those of other studies as **Badrinarayan et al. (2010)**, noted that 40.83% of victims of RTAs in his study were 16 to 30 years old.

Singh and Dhattarwal (2004) found that the most represented age group of victims involved was 21 to 30 years (27.3%).

Results of other studies found that victims of RTAs 16 to 30 years old and 15–35 years old were most commonly involved **(Sathiyasekaran 1991; Dhingra et al.1991)**.

A study on RTAs in Ethiopia concluded that 63.9% of victims were younger than 35 years old (**Negesa et al., 2017)**.

In the current study 64.1% were form rural areas and 35.9% were from urban areas as Menoufia governorate is considered mainly as a rural area. Rural roads usually lack traffic lights and traffic police committees which exert efforts to control speed of vehicles and check drivers for substances of abuse. This was in agreement with that noted by Mishra et al. (2010) (rural areas 65.83% versus urban areas 34.17%).

Large percentages of victims were below secondary education or illiterate (42.4% and 16.1%, respectively). This low level of education could affect their awareness and ability to understand traffic lights, so this can be improved by educating public through the mass media. This was in agreement with results of **Kuchewar, Meshram and Gadge, (2012)** who also noted that majority of cases had lower level of education.

Gender:

Majority of cases in the present study were males (81.6%).

Studies form other developing countries showed near percentages of male dominance as 81.3% in Yemen **(Abdulhameed et al., 2016)** and 83% in India **(Jha et al., 2004)**.

This is consistent with societies where women's mobility is restricted. Men in contrast usually spend more time in transportation means traveling from place to another and more commonly employed as drivers.

Statistics from other countries showed a gender difference but with smaller percentages; Australia with 66% being male **(Haworth and Bowland, 2000)** and Turkey with 68% being males **(Durak et al., 2008)**.

Type of vehicle:

The majority of cases in the current study were due to four wheels motor vehicles accidents (62.4%). This denotes that cars and buses are the main cause of accidents in our governorate but accidents caused by three wheels vehicles and motorcycles (26.9% and 10.7% respectively) should not be neglected as these vehicles are increasing in our country as they are relatively unsafe vehicles, riders and occupants in these vehicles are usually unprotected. These findings were similar to those noted by Eke and **Frcsed(2000)** in their study and in contrast to **Chalya et al. (2012)** who found that most accidents were caused by motorcycle (58.8%), followed by motor vehicles (38.7%).

Victim status:

Pedestrians in the current study were the most common victims of RTAs (54.2%) followed by passengers, motor cyclists and lastly drivers (31.4%, 7.6% and 6.8% respectively). These results may be explained by decreased awareness of the public using roads and lack of proper walk paths for pedestrians, lack of commercial installations and walking pavements by the side of the roads, or defects in the understanding of traffic signs. It may also reflect the high speed of these vehicles or lack of control on them by their drivers, who may drive under effect of drugs.

These results were similar to those noted by **Akinpelu et al. (2007)** and **Jha and Agrawal (2004)**. But other studies reported different results as passengers were the majority of victims of RTAs **(Museru & Leshabari, 2002; Chalya et al., 2010)**.

According to results of the present study there were highly statistically significant differences between types of victims in different age groups as higher percentages of victims aged less than 15 years, 31-45 and over 60 years were pedestrians in relation to other victims. This could be due to young pedestrians (<15years) being more active and careless, not paying attention while crossing roads. Older people (over 60 years), may have some debilitating diseases and decreased visual acuity which may predispose to accidents. While the percent of victims who were from 15 to 30 years old were more commonly motor cyclists, as young age (15-30years) drivers are usually characterized by aggression and risky driving (driving competitively, improper turning or passing and speeding,) that may leads to negative outcomes **(Trimpop and Kirkcaldy 1997; Neuman et al., 2003; Oltedal and Rundmo 2006)**.

Finally percent of victims 46-60 years were more commonly drivers. This is may be due to normal eye changes in this age as focusing problems due to refractive errors or as a

result of negative effects of other diseases as diabetic or hypertensive neuropathy that may predispose them to accidents **(Fozard, 1990)**.

Method of transfer:

More than half of the victims were brought to emergency room (ER) of Menoufia University Hospital by ambulance (57.60%). This disagrees with **Negesa et al. (2017)**, who found that majority of their cases were brought to hospital by their relatives and only few numbers received care before coming to hospital which may affect patient's outcome.

Place of treatment:

60.4% received treatment at different hospital departments, majority of them were admitted to orthopedic departments (39.9%) and 24% to neurosurgery while 14.4% needed ICU management. This agrees with **Negesa et al. (2017)**, who reported that most of admissions in their study were to orthopedic ward with the second most common cause being due to head injuries.

Periods of the day:

The majority of accidents occurred at morning and early afternoon (9am-3pm) (45.20%) followed by late afternoon and evening (3pm-9pm) (37.5%). As these hours of the day are the time of people activities (going to work or schools in morning and returning to home in afternoon or evening) and so traffic is heavy. This finding is consistent with an investigation done in India by **Singh (2017)** who reported that RTA was most common in the hours from 9am to 9pm and less common at night and in the early morning. **Zhang et al. (2017)** also confirmed this finding, while it was slightly contradicted by **Nangana et al. (2016)** who found that RTAs were high in the 5pm to 8pm time range followed by 9am to 12pm and low in the early morning (5am to 8am).

Seasons of the year:

There was a seasonal variation regarding occurrence of RTAs, as they were most commonly occurred in summer and spring (31.7% and 29.3% respectively). People tend to be more active in these seasons with crowding of roads and heavy traffic. Also in the summer hot weather increases tension and stress and decrease concentration, intellectual task performance and visual acuity of road occupants, all of which are considered as important risk factors for RTAs. **Nofal and Saeed (1997)** described similar findings. **Pathak et al. (2014)** also reported that 29.67% of their cases occurred in July to August due to monsoon weather with vision impairment, problems in judgment, and vehicle skidding.

Type and site of injuries:

Regarding type of injuries: On external examination in the ER abrasions / contusions were the most common injuries sustained by RTA victims (75.9%) followed by lacerations (48.6%) and crush injuries (1.8%).40.5% of findings in investigations were fractures, intracranial hemorrhage in 13.3%, hemothorax / pneumothorax in 10.8% and organ injury in 3.6%. This is similar to **Singh et al. (2014)**, who found that abrasions and lacerations were the most common external injuries in their study. This agrees with **Hanna and El-Shereef (2011),** who observed that the most prevalent injuries in their study were superficial injuries (abrasions / contusions), with fractures in 32.2%, lacerated wounds in 17.6%, crush wounds in 8.1%, and injury of organs in 2.0%. However **Khan et al. (2007)** reported that bone fractures were the most common. This

Difference can be explained by that different countries have different types of roads and variations in road users that may affect type and site of injuries and make them show differences from country to another.

Regarding site of injuries: Limbs were the commonest sites of injury (70.04%) followed by head and neck (65.5%).Many investigations reported similar findings **(Khajuria et al., 2008; Chalya et al., 2010; Negesa et al., 2017)**. In the other hand **Jha N et al. (2003)** found a greater frequency of head injuries than lower limbs injuries, while **Reddy et al. (2014)** observed more chest and abdominal injuries than head and limb injuries.

Site and type of RTA injuries show wide variations according to road users who differ from country to country, and even between different regions of the same country **(Odero et al., 1997)**.

Also it was observed that about two thirds of cases had injuries in the head/ neck and was the second cause of admission in patients. **Agrawal et al. (2009)** concluded that RTAs are the most common cause of head injuries attributing it to careless driving and recklessness, poor vehicle maintenance, driving under the effect of drugs and alcohol, disregarding traffic rules and safety measures, and inappropriate street use by pedestrians.

The present study showed highly significant relationship between type and site of injury and victim status as P value<0.001; where there was more frequency of lacerations (73.2%), fractures (60.5%), injuries in head (94.9%) including intracranial hemorrhage (49.04%) and limb injuries (93.6%) in motor cyclists. This almost supported by the study of **Shalaby et al. (2010)** in which there was more prevalence of fractures, laceration of muscle and superficial tissues and injuries in the head, chest and abdomen in motor cyclists. The scenario of motor cyclist accident, the lack of protection inherent in a motorcycle, and nonuse of protective measures as helmet make motorcyclists more susceptible to these injuries. **Pathak et al. (2014)** concluded that motorcyclists who did not wear headgear sustained a higher percent of head injuries and stressed on its protective effect.

There was more prevalence of abrasions/contusions (77.9%), crush injuries including amputations (3.1%), nerve/arterial injury (3.2%), and abdomen/pelvis injuries (14.1%) including intra-abdominal hemorrhage (6.2%) and back/spine injuries (24.8%) in pedestrians. **Al Madani and Al Janahi (2006)** observed more frequency of pelvis and lower limbs injuries in pedestrians and also **Shalaby et al. (2010)** reported amputations only in these type of victims. **Shepherd (2003)** attributed pedestrians injuries to the collision of their body with the vehicle affecting lower limbs, pelvis and abdomen (primary impact injuries), then thrown to the ground (secondary injuries) where any part of the body can be injured and sliding abrasions can be sustained, striking with windscreen or its metal frame (head injuries) or crushing under wheels in run over injuries (crush wound and amputations).

It was observed that the percent of chest injuries (58.4%) including hemothorax/pneumothorax (52.8%) were higher in drivers than other types of RTA victims; this is may be due to mechanism of their injury (forward jerk) where they can be impacted against steering wheel especially in those who are not using seat belt. Also it was found that the percent of chest

injuries including hemothorax / pneumothorax and other internal injuries were more in drivers than vehicle passengers and this is in accordance with **Santamoria et al. (2007)**.

This is in contrast to **Ryan et al. (2004)** and **Shalaby et al. (2010)** who stated that these injuries were more frequent in passengers than drivers. The contrast may be due to geographical variations as explained before.

Severity of injuries:

According to legal classification (based on the amount of damage), 37.4% were simple or slight, 53.3% dangerous injuries, and only 9.3% were fatal. The finding was in accordance with **Hanna and El-Shereef (2011)** who observed that 38.2% of their cases sustained minor injuries and study by **Pathak et al. (2014)** in which 71.9% of RTA injuries were severe. Also quietly similar to a study done in the Democratic Republic of the Congo by **Nangana et al. (2016)** who reported that deaths occurred in 6% in RTAs, severe and very severe injuries 28 %, and moderate injuries 14 %. This is in contrast with that done in Greece by **George et al. (2017)** in which slight injuries were the most common type. This difference may be due to access to emergency medical care.

Substance Abuse:

Screening for substances of abuse was done for 156 cases (92 of drivers and 64 of motor cyclists) (52.17% of the total number of drivers and motor cyclists). The cannabinoids and tramadol were the most common substance of abuse found as they were 31.5% and 20.7% in drivers and 26.6% and 32.8% in motor cyclist respectively. Benzodiazepines and alcohol were only 3.3% and 1.1% in drivers and 3.1% and 3.1% in motor cyclists. This almost agrees with **De Boni et al. (2011)**, who documented more prevalence of cannabis use than alcohol among drivers involved in RTAs.

Many investigations found that drug use (cannabis, benzodiazepine) impairs motor skills important for driving and so increases the risk of RTAs **(Fergusson et al., 2008; Hall, 2009; Rapoport et al., 2009)**. A laboratory study done by **Lenne et al. (2010)** showed that marijuana use impaired motor skills and cognitive abilities involved in driving.

National Highway Traffic Safety Administration, (2008) reported that 14% of U.S. drivers/motorcyclists fatal crashes in 2008 were associated with driving under the effect of drugs and alcohol. Also **Senna et al. (2010)** concluded that marijuana, opiates, benzodiazepines, and cocaine are the commonly detected drugs in motorists in Switzerland**.**

Arria et al. (2011) indicated a highly relation between RTA and drug and alcohol abuse and considered their use a risky behavior during driving.

As regards outcome: 9% of victims were cured with permanent infirmity in the form of limitation of movement (in 68.3% of them) followed by amputation, splenectomy, craniotomy flap (12.9%, 9.1% and 8.1% respectively) and the least was paraplegia (1.6%). The death rate was 9.3%. More drivers were cured with permanent infirmity (16.2%) and with higher death rate (14.8%) in relation to other victims (P value<0.001). This denotes the severity of injuries associated with that dangerous place of drivers. These figures of permanent infirmity were much more than noted by **Chalya, et al. (2012)** who noted lower incidence of permanent infirmity

(3.8%) in the form of limb amputations in 40 (23.8%) patients, permanent neurological deficit in 5 patients, severe spinal injuries with paraplegia in 4 patients, post-traumatic seizures in 2 patients and traumatic penile amputation in one patient. However he denoted a higher mortality rate **(**17.5%**)**.

In present study head injury was the main cause of death in about 52.6% of dead cases. This result was in agreement with that noted by **Saleem et al .(2015),** who declared that head injury alone was responsible for 66.6% of dead cases while head injury combined with other injuries were reported in 84.6%. He also noted a higher prevalence of fatal injuries for front seat passengers (43.9%) and drivers (35.7%), than for back seat passengers (15.3), and a very low percentage for pedestrians (5.1%). However, the **WHO report (2013)** noted that more than half of the dead cases in RTAs were pedestrians and cyclists.

RECOMMENDATIONS

RTAs need effective rapid preventive measures to decrease its incidence.

- The provision of tailored messages to all members of the community regarding knowledge and practices of road safety measures like appropriate use of pavements by pedestrians and avoiding risky driving behaviors is recommended.
- Compulsory use of motorcycle helmets would appear to be a very important intervention to decrease road traffic accidents.
- Road authority and traffic polices should apply strict control on substances of abuse by regular screening for drivers.
- License for driving should be given only to qualified persons after strict testing.
- Further research is recommended for exploring the risk factors either in road structure or personal factors that increase the frequency of RTAs.

LIMITATIONS

Need for consent for screening may have resulted in underestimation of detection of substances of abuse as a risk factor for RTAs.

COMPETING INTERESTS

The authors declare that there is no conflict of interests regarding the publication of this article.

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الملخص العربى للبحث

دراسة نمط حالات حوادث الطرق التى أدخلت مستشفى جامعة المنوفية على مدى عام "دراسة مستقبلية"

فاطمة شعبان قنديل ستهم السيد العجمى

قسم الطب الشرعى والسموم الإكلينيكية –كلية الطب –جامعة المنوفية

تعتبر حوادث الطرق من الاسباب الاساسية لحدوث العاهات والوفيا فى جميع انحاء العالم وهى فى ازياداد مستمر فى البلاد النامية ولذلك كان الهدف من هذا البحث هو دراسة حالات حوادث الطرق من حيث العوامل الديموجرافية والاصابات لهذه الحالات من الناحية الإكلينيكية وكذلك مصير هذه الحالات.

وقد أجريت هذه الدراسة على جميع حالات حوادث الطرق والتى ادخلت لمستشفى جامعة المنوفية على مدارعام (من شهر يوليو2016 الى شهر يونيو 2017. وقد تم عمل استمارة طبية لكل حالة تسمل البيانات الخاصة بها وكذلك الفحص الإكلينيكى ، وتم تقسيم الحالات تبعا لعمرها اقل من 15 عاما، من 15-30، 31-45، 46- 60، واكثر من 60 عاما وقد تم تقسيم الاصابات الموجودة بهم الى سحجات وكدمات جروح راضة وبتر اصابى وكسور وكذلكمصير هذه الحالت او ما آلت اليه عند خروجها من المستشفى.

وقد كان من أهم نتائج البحث أن عدد هذه الحالات هو 2080 حالة. وقد أوضحت الدراسة أن حالات الذكور كانت تمثل 81,6% مقابل 18,4% من الإناث وكان أكثر الفئات العمرية تعرضا للحوادث الفترة من 15-30 سنة. وقد كان حوالى 64,4% يقطنون الريف.

وقد كانت معظم الحالات نتيجة حوادث السيارات (62,4%) وكان أكثر من نصف الضحايا من المشاة (54,2%)يليهم المسافرون (31,4%). السحجات والكدمات كانت تمثل معظم الاصابات الظاهرية لضحايا الحوادث(75,9%). وقد عانى أكثر من نصف الحالات من اصابات خطيرة (53,3%)، وحوالى 37,4% من اصابات بسيطة بينما عانى حوالى 9,3% من اصابات مميتة

وقد غادرت معظم الحالات بعد شفائها(79,6 %) وحوالى 9 % قد شفيت مع وجود نسبة من الإعاقة وكان نسبة حالات الوفاة حوالى 9,3%.

وأخيرا نوصى بضرورة الاهتمام بوضع اشارات المرور على جانبى الطريق وتعليم المشاة هذه الاشارات من اجل تقليل حوادث الطرق. كما ينبغى وضع قوانين صارمة للحد من السرعة المفرطة على الطرق بالاضافة الى الالتزام بارتداء الخوذة بالنسبة لسائقى الموتوسيكلات وكذلك حزام الامان بالنسبة للمسافرين بالسيارات وايضا وضع ضوابط صارمة للحد من تعاطى المواد المخدرة اثناء القيادة. كما نوصى بالاهتمام بالطرق وتحسين حالتها وتجديد رصفها للتقليل من الحوادث.