Original Article

Comparative study of injuries caused by an accident in bodies referred to the forensic medicine of lorestan province

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ABSTRACT

Driving accidents is one of the major health problems around the world. In our country, these accidents are 13 times the global average, causing the loss and injury of a large number of people every year. In Iran, according to statistics released by the country's forensic medicine, the number of deaths from accidents has increased by 10%, which could be due to unfavorable traffic safety in the country. The present study is a descriptive-cross-sectional prospective study that aims to investigate the epidemiological causes of driving accidents in Lorestan province during the years of 78, 79 and 80 years. This is done with the aim of comparing the injuries caused by an accident in the bodies referred to the legal guardians of Lorestan in the years 78, 79 and 80. Data are collected through the study of all dossiers resulting from the accident and then analyzed by SPSS software. The results of the study showed that the number of victims of accidents over the course of these three years has risen and 1457 people have died, of which 449 people in 78, 470 in year 79 and 538 in 80 years. The highest number of deaths was related to men. The majority of the victims were 21-40 years old and illiterate. Also, most of the victims died at the site of the accident and because of a stroke. Most accidents resulted in the death of riding cars. Among the cities of the province, Khorramabad and Boroujerd, respectively, had the highest rates of death. Most of the accidents occurred in April, due to the moonlighting of vehicles for Norouz travels.

Keywords: Driving accident, Forensic Medicine, Lorestan, Epidimiologhic

Introduction

Traffic accidents are one of the most important health problems, jeopardizing the health of humans. More than 1.26 million people die annually due to traffic accidents. The World Health Organization has predicted that deaths caused by traffic accidents accidents will reach 2.34 million people by 2020. Various studies conducted in different parts of the world suggest that about 1.2 million people die each year and about 50 million people are injured due to the accident [1-4]. Almost 2.5% of the driving accidents in the world occur in Iran, meaning that the rate of accidents in Iran is 20 times higher than that of other countries. These accidents rate in Iran is 13 times more than global average, and cause death and injury of many people every year. In Iran, based on the statistics reported by Iran's Forensic Medicine Organization, the number of deaths caused by accidents increased by 10%, which could be due to undesired traffic safety in Iran. Most of the injuries and deaths in the world are due to road accidents. About 1.2 million people die every year and about 50 million people are injured by accident, which 30-70% of them are hospitalized in developed countries as a result of orthopedic injuries [5]. In developed countries, road accidents are the most common cause of death in people aged below 50 years and the third most common cause of disease after depression and heart disease [6]. The rate of death caused by accident are increasing rapidly in low-income countries and it is estimated that the deaths caused by accidents to reach 8.4 million by 2020 [7]. Trauma is considered as one of the most important public health challenges in the world. With progress of science and technology and the industrialization of societies in the last century, trauma and its complications have become a major problem.

Access this article online	
Website: www.japer.in	**E-ISSN:** 2249-3379

How to cite this article: Mehdi Forouzesh, Abdolrazagh Barzegar, Forutan Salehinezhad, Hamidreza Nazifi, Leila Dousti. Comparative Study of Injuries Caused by an Accident in Bodies Referred to the Forensic Medicine of Lorestan province. J Adv Pharm Edu Res 2019;9(S2):101-105.
Source of Support: Nil, Conflict of Interest: None declared.

Trauma refers to any injury, harm, shock, lesion, and accident imposed to the human body, provided that it is imposed from out of body and the internal agent or disease is not the cause of injury. Injuries leading to such a death include severe damage to the brain or spinal cord, rupture of the heart and large vessels, and internal bleeding caused by abdominal trauma [8]. The rate of death in Iran in 2005 showed that, regardless of gender, trauma is the second cause of death. By conducting epidemiologic studies in medical sciences, social sciences and behavioral sciences, the accidents and consequences of them can be reduced. The reports of police force, forensic medicine, healthcare centers, insurance organizations, or registration centers can be used to collect data on deaths caused by driving accidents. Each of the organizations and centers register various factors for the deaths caused by accidents. For example, in the United States, the leading cause of deaths due to accidents is motor vehicles, and 115 deaths per day are recorded for this reason. Adolescents and young people are more exposed to fatal motor vehicle accidents than other age groups, so that driving accidents are the leading cause of death among American men aged 15 to 24 years [9].

Vagefi et al (2015) conducted a research entitled "Comparative study of traumas caused by accidents in corpses referring to forensic medicine in Kerman Province in 2007 and 2013" in a descriptive cross-sectional study. In this research, head injury as a result of accident has been recognized as the greatest public health problem and the cause of death and disability in this province [10]. In their research entitled " epidemiology of deaths caused by driving accidents in Gilan province during the years 2012-2013", Monsef et al. (2015) found that the highest accidents occurred on the suburban roads with 1147 cases, the highest rate of deaths with 864 cases occurred at the accident site, the highest cause of death with 941 cases was due to head injury, and the highest accidents with 458 cases occurred in the fall. Moreover, most of people died due to traffic incidents were male, which interventions are required to prevent this problem [11].

Dolatabadi et al reviewed the medical record of children referred to the Emergency Ward Trauma Unit at Imam Hossein Hospital in Tehran in 2011 and 2012. The results showed that the most cases of trauma in people aged below 14 years referred to the emergency ward of Imam Hossein Hospital related to males, summer season, hours between 19 and 24, and with the mechanism of driving accidents. Moreover, 1.8% of trauma cases were associated with death and the most of the traumas led to death was related to trauma of the chest and abdomen [12].

A cross-sectional study was conducted on traumatic patients referred to Shahid Beheshti Hospital in Babol due to traffic accidents during the years 2010-2012. The results of the study showed that trauma caused by traffic accidents is more in the specific season and hours of a day. Thus, local identification of effective factors in accidents can be a good guide for health authorities for accurate and effective planning in order to promote community health [13]. In a descriptive-analytical study, the traumatic pattern and its related factors in the injured patients treated in Besat Hospital of Sanandaj in 2011 were examined.

The results showed that the high rate of accidents were seen in young people, which are among the most active and efficient group of the society. Moreover, incidents caused by accidents require serious planning. Moreover, to reduce the deaths caused trauma, we can refer to the role of hospital emergencies and their equipping [14].

Reddy et al. (2014) showed that half of the fatal road accidents occurred in the age group of 21 to 40 years, and 92 percent of the dead people were male [15]. Iran is also considered as one of the countries with the highest number of accidents and deaths caused by road accidents. It has led to an increase in direct costs (healthcare costs caused by accident and incident care (such as the creation of psychological problems and depression in the family, the loss of active labor force permanently or temporarily) [16, 17]. Given the frequency of traffic accidents and its severe and fatal injuries in Iran and its individual and socio-economic consequences, it is obvious that the first and most basic step in preventing and controlling accidents is identifying and evaluating problems to reduce the burden of injuries caused by traffic crashes. Thus, it is necessary to conduct this study to determine the change or lack of change in the victims of traffic accidents of Lorestan province; so that by conducting this comparison, the effectiveness of the solutions proposed to reduce Lorestan province accidents to be investigated and reconsidered, if necessary.

Methodology

The present study is a descriptive-cross-sectional and prospective study. The research population included the victims of traffic accidents in the years of 1999, 2000 and 2001 in Lorestan province. The information was collected through the study of medical records of people died due to accidents and referred to General Office of Forensic Medicine of Lorestan province. The procedure was in this way that the information of victims such as age, gender, accident site, and the vehicle was collected. The results of the pathology and fatal trauma of other parts of the body were based on the examination and autopsy of the dead people. To compare the variables, frequency (percentage) was used and for descriptive statistics (mean, frequency, and percentage), and presentation of the table and charts, SPSS24 software was applied. All information and names derived from the medical records of General Office of Forensic Medicine of Lorestan province remain confidential.

Data analysis

By examining the information derived from the collected data, it was found that the mean age of the dead people was 41.62 years with a standard deviation of 21.06. Moreover, the minimum age of samples was 1 year and the maximum age as 96 years. Table 1 presents the distribution of the age variable of the research subjects.

Table 1. Descriptive information of age of the research subjects

Variable	mean	SD	min	max
dead people age	41.62	21.06	1	96

Table 2 presents the distribution of frequency of gender, marital status, residence status, and the level of education of the research subjects.

Table 2. Frequency distribution of gender, marital status, and residence status and education level of the subjects

variable		f	%
gender	male	308	78.2
	female	86	21.8
	total	394	100
Marital status	married	259	65.7
	single	134	34
	unknown	1	0.3
	total	394	100
Residence status	city	242	61.4
	village	149	37.8
	others	1	0.3
	unknown	2	0.5
	total	394	100
Level of education	Illiterate	110	27.9
	Elementary	89	22.6
	Secondary	60	15.2
	High school	19	4.8
	diploma	70	17.8
	student	6	1.5
	Associate	12	3
	Bachelor	17	4.3
	Master and higher	8	2
	Unknown	3	0.8
	total	394	100

Table 3 presents the frequency distribution of accidents in cities and the lighting status of accident site

Table 3. Frequency distribution of accidents in cities and lighting status of accident site

variable		f	%
Accident site city	Khorramabad	97	24.6
	Boroujerd	61	15.5
	Pol-e Dokhtar	52	13.2
	Aligudarz	27	6.9
	Delfan	7	1.8
	Noorabad	15	3.8
	Kuhdasht	36	9.1
	Durud	31	7.9
	Azna	33	8.4
	Dowreh and Chegeni	12	3
	Aleshtar	11	2.8
	Mamulan	4	1
	Rumeshkhan	2	0.5
	Veysian	3	0.8
	Bayranshahr	3	0.8
	total	394	100
Lighting status in accident location	daylight	253	64.2
	night	105	26.6
	During sunrise or sunset	34	8.6
	unknown	2	0.5
	total	394	100

Table 4 presents the frequency distribution of the injury site, the cause of death, death site and suburban accidents.

Table 4. Distribution of the injury site, the cause of death, death site, and suburban accidents

Variable		f	%
Injury site	Head and face	268	68
	neck	35	8.9
	Chest and abdomen	55	14
	Head and leg	24	6.1
	pelvis	6	1.5
	Posterior trunk	6	1.5
	total	394	100
Cause of death	Head injury	190	48.2
	bleeding	44	11.2
	Multiple fractures	133	33.8
	burning	9	2.3
	Choking	6	1.5
	Other cases	12	3
	total	394	100
Death site	At accident site	203	51.5
	During transferring to hospital	34	8.6
	hospital	155	39.3
	home	2	0.5
	Total	394	100
suburban accidents	freeway	37	9.4
	highway	32	8.1
	main road	247	62.7
	Sidetrack	13	3.3
	Rural road	21	5.3
	Ring road	10	2.5
	Exclusive passages	9	2.3
	unknown	25	6.3
	total	394	100

Table 5 presents the distribution of the involved vehicles, accident occurrence type and the status of the dead people.

Table 5. Distribution of involved vehicles, accident occurrence type, and the status of the dead people

Variable		f	%
Vehicle type	car	3	0.8
	Minibus	89	22.6

	omnibus	2	0.5
	Pickup truck	2	0.5
	truck	13	3.3
	camion	7	1.8
	lorry	13	3.3
	motorcycle	8	2
	Peugeot 405	27	6.9
	Peugeot 206	10	2.5
	Pride	31	7.9
	Peugeot Pars	13	3.3
	Samand	27	6.9
	Peykan	3	0.8
	Tondar	2	0.5
	unknown	54	13.7
	Benz	4	1
	Volvo	2	0.5
	Nissan	15	3.8
	Peykan	7	1.8
	Benz camion	21	5.3
	Volvo camion	5	1.3
	Scania camion	1	0.3
	Howo camion	3	0.8
	Benz lorry	8	2
	Volvo lorry	11	2.8
	Scania lorry	2	0.5
	Howo lorry	1	0.3
	total	394	100
accident occurrence type	Collision with another vehicle	181	45.9
	Vehicle collision with pedestrians	86	21.8
	Vehicle collision with fixed object	23	5.8
	Overturning of the carrier vehicle	95	24.1
	Falling the vehicle containing the dead people	6	1.5
	Vehicle fire	1	0.3
	others	2	0.5
	total	394	100
Dead people status	driver	141	35.8
	pedestrian	83	21.1
	Passengers of the vehicle	164	41.6
	unknown	6	1.5
	total	394	100

Discussion and Conclusion

The current research investigates the types of injuries caused by an accident in the bodies referred to the forensic medicine in Lorestan province in terms of gender, age, accident site, and death site, vehicle type, and so on. The sample size was determined to be 1457 people. In examining the descriptive study, the mean age of the dead people was 41.62 years with a standard deviation of 21.06 and 78.2% of the subjects were male and 21.8% of them were female. In examining the marital status of the subjects, it was found that 65.7% of them were married and 34% of them were single and the highest frequency with 27.7% related to illiterate people and the lowest frequency with 1.5% related to students. In examining the death type and the injury site, it was found that the highest injuries were on the head and face (68%). In examining the type of vehicle used, it was found that the highly- used vehicle belonged to Pride with 22.6%. In examining the status of the dead people, it was found that 164 (41.6%) cases were passengers and 141 (35.8%) of the dead people were drivers. In addition, in examining the accident occurrence type, it was found that the highest accident rate related to accident with other vehicle with 45.9% and the highest number of dead people related to the accident site with 26.2%.

Studies have shown that the rate of death in the world have increased by 13% over one decade. In Iran, based on the statistics reported by Iran's Forensic Medicine Organization, the number of deaths caused by accidents increased by 10%, which could be due to unfavorable traffic safety in Iran. For this reason, it is recommended that serious measures to be taken by the relevant authorities to reduce the rate of traffic accidents, especially during crowded and high-traffic months. Most of the deaths in these accidents were due to head injuries and the second factor was multiple fractures causing severe bleeding and damage to their lower limbs. In addition, statistics of Forensic Medicine in Lorestan province showed that 1457 people died during the three years of the accident, of which 449 people died in 1999, 470 died in 2000 and 538 people died in 2001. The highest number of deaths related to males. The majority of the victims were in the age range of 21-40 years and illiterate. In addition, most of the victims died at the accident site and due to traumatic brain injury. Most accidents led to death occurred in cars like Pride. Among the Lorestan province cities, Khorramabad and Boroujerd had the highest rate of death. Most of the accidents occurred in April, which is one of the high-traffic months due to Nowruz trips. The results of the present study suggest that the number of victims caused by accidents showed increasing trend in the years 1999, 2000, and 2001. Based on the data, most people dead in accidents had mean age of 41.62 years, were males, and most of the accidents related to a crash with another vehicle and the passenger or back seat of the vehicle.

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