

Epidemiology of Accidents in Tehran Emergency Medical Service During 2012 to 2013

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Abstract

Background: There is a lack of epidemiological data on emergency Medical service (EMS) missions for accidents in Iran. The present study aimed at obtaining representative data on the epidemiology of emergency Medical service missions for accidents in Tehran.

Methods: Active EMS stations in Tehran were selected through stratified random sampling in different regions of the city during a twelve-month period from March 2012 to March 2013. Data was collected through a questionnaire on demographic information, which extracted from events recorded on dispatch electronic forms in EMS. Data was analyzed by Excel using descriptive statistics.

Results: Based on the type of accidents, Road Traffic Accidents (RTA) and downfall in the North, stab wound in the East, burning in the West, and poisoning with CO in the East region of Tehran megacity had the highest rates compared to other areas. The most common of all were Road Traffic Accidents (RTA) (77.9%) stab wound (11.1%), falling down (4.6%), burns (2.1%), and Carbon Monoxide (CO) poisoning (1.5%). Most accidents occurred in males and 20- to 40-year-old age group (45.51%), and the western district had the first rank in Tehran.

Conclusions: According to demographic and geographical rate of accidents, It is recommended to develop preparedness programs and response plan according to epidemiological information of accidents. This programs includes EMS staff trainings and community educations.

Keywords: Emergency Medical Services (EMS), Accidents, Reports, Tehran, Road Traffic Accidents (RTA)

1. Background

Accident is one the most important problems of public and social health around the world that leads to 12% of world's illnesses and is the third main reason of death around the world. According to the reports of the world health organization (WHO), nearly 1.2 million people lose their life in traffic accidents every year and more than 50 million people are injured, which is equal to the population of five large cities (1). Accidents do not only belong to developing countries, and also occur in developed countries, especially with the arrival of industry and technology in human life, and the development of communication and urbanization, thus accidents are a major threat for human resources in different societies. In fact, this condition is what human beings have to lose for the development of technology (1). The increasing numbers of different kinds of accidents with several victims are undesirable consequences of urbanization (2). Pre-hospital emergency

as a subset of medical emergency and events management center is the intersection of the hospital and society and is one of the institutes that people require in events (3).

Accidents include unplanned events that can cause injury every day. Around the world, almost 16,000 people die from various injuries every day. Road traffic injuries are a major cause of mortality and account for more than 22% of all deaths related to injuries and will be the third leading cause of worldwide death until 2020.

Iran is a country with a high rate of road traffic crash fatality and injury. According to statistics from the forensic Medicine organization of Iran, traffic crashes resulted in an annual average of 24,000 deaths (i.e. 3 people per hour) and approximately 240,000 injuries. Trauma is one of the most important factors that lead to death and disability around the world. In Iran this factor is the second cause of death and disability (4). Trauma is one of the most important issues in emergency events and this importance doubles as a result of high rates of accidents.

Trauma is the reason for around one-third of calls to the Tehran EMS dispatch (5). Classification of recorded events in emergency communication center, include eye damage, collapse, electrocution, accidents, being shot, entrance of foreign things to the airways, pregnancy, frostbite, downfall, burning, job-industrial damages, stab wound, drowning, mutilation, heat stroke, insect bites, and poisoning with CO (6). Tehran is a metropolis and the capital of Iran with a population of 8244579 and an area of 212 square kilometers (7, 8). A diverse urban population needs appropriate and timely services considering the situation of different areas (9). In 2000 a survey by Bunting Jr with the title of calculating the frequency of serious reportable adverse events and hospital-acquired conditions in 2010 are available (10). There is a lack of epidemiological data on emergency Medical service missions for accidents in Iran. Therefore the aim of the present study was to obtain representative data on Epidemiology of accidents in Tehran emergency Medical service during in 2012 to 2013.

2. Methods

A cross-sectional study was conducted during twelve months, from March 2012 to March 2013. According to the information obtained from the pre-hospital EMS in Tehran, 132 active EMS stations in Tehran were selected through stratified random sampling in different regions of the city. The study population consisted of victims or patients, who had referred to EMS centers of Tehran.

After contact with EMS, if it was necessary to dispatch ambulance, Tehran emergency experts systematically received the patient's information, such as name, gender, age, reason of call and address, and through an internal network, they obtained information from the control room or dispatch unit. Classification of dispatch unit was according to quadruplet areas of the North, South, East, and West. According to the location of accident in each area, this unit decides to dispatch the nearest base to the accident location. In emergencies, such as accidents, downfalls, burning, beating, wounding as well as extreme cases, such as cardiovascular and respiratory problems, basic information may have not been recorded by experts to prevent wasting time and EMTs (emergency Medical technician) provides these information to the dispatch operator after completion of the mission via EMTs. The EMT is someone, who has been trained for providing emergency care in the scene and should have the state license or certification of EMT, and nurses or licensed physicians. Moreover, confusion and anxiety causes wrong records of some information of the patient. At the end of each mission, the emergency communication recording center saves the patient's basic information, according to the bases. After

coordination with Tehran emergency safeguard and presidency, each area of Tehran was selected as one class on the basis of classified sampling from statistical society of this study, which was 24 out of 132 active EMS stations in Tehran, selected through stratified random sampling in different regions of the city.

Then, referring to Tehran Emergency Communication Record Center, related data to the kinds of events and the frequency of different events that led to calls to 24 bases and quadruplet areas were extracted and analyzed by Excel with descriptive data.

These data were extracted for research, and academic honesty has been observed at all levels of the research.

3. Results

Table 1 describes the frequency of events at 24 bases under study as well as frequency at 6 bases of quadruplet areas of the North, South, East, and West, respectively. This Table to various age groups. The Table shows the frequency calls to 24 emergency bases, which were divided to 4 areas.

Table 2 describes the frequency of 5 kinds of accidents, separately, according to various age groups. The above Table describes the frequency of various events that led to calls to 24 bases and quadruplet areas regarding the 5 most frequent events.

Figure 1 compares the frequency of accidents, stab wound, downfall, burning, and poisoning with CO in each of the quadruplet areas. The Figure illustrates events, which had tangible difference in four areas, namely burning and stab wound in the west, poisoning with CO in the east and downfall in the north.

The study showed that road traffic accidents (77.9%), stab wound (11.1%), downfall (4.6%), burning (2.1%), and poisoning with CO (1.4%) were the most frequent. Meanwhile, a separate survey of each of the 4 areas showed the following data, accidents (80.06%), stab wound (8.03%), downfall (6.3%), burning (1.5%) and poisoning with CO (1.1%). In six bases of the Northern area these results were recorded: accidents (79.9%), stab wound (11.06%), downfall (3.2%), burning (2.3%), and poisoning with CO (1.2%).

4. Discussion

The aim of this study was to investigate the epidemiology of accidents in Tehran Emergency Medical Service. The research showed, road traffic accidents (77.9%), stab wound (11.1%), downfall (4.6%), burning (2.1%) and poisoning with CO (1.4%), had the maximum frequency. It was similar to results of Uthkarsh et al. study which showed, 69.1% of patients were injured in road traffic accidents (RTA), 28.7%

Table 1. The Frequency of Different Events that Led to Calls to 24 Bases and Quadruplets^a

Kind of Event	24 Bases	6 Bases of the North Area	6 Bases of the South Area	6 Bases of the West Area	6 Bases of the East Area
Eye damage	0.80	0.40	0.07	0.16	0.19
Collapse	0.37	0.74	0.42	0.77	0.46
Electrocution	0.32	0.76	0.58	0.55	0.63
Accidents	77.98	80.61	79.90	75.70	76.83
Shooting	0.16	0.10	0.17	0.24	0.14
Foreign body in the airway	0.50	0.02	0.03	0.10	0.07
Pregnancy	0.07	0.08	0.04	0.06	0.19
Frostbite	0.02	0.04	0.01	0	0.02
Downfall	4.64	6.34	3.26	2.46	2.36
Burning	2.17	1.53	2.36	2.46	2.36
Job-industrial	0.28	0.22	0.31	0.28	0.34
Stab wound	11.10	8.03	11.06	12.45	11.95
Downing	0.05	0.08	0.03	0.06	0.04
Mutilation	0.18	0.14	0.21	0.14	0.24
Heatstroke	0.05	0	0.04	0.14	0.04
Insect bites	0.13	0.12	0.17	0.16	0.14
Poisoning with CO	1.49	1.10	1.20	1.29	2.67
Other	0.03	0	0.04	0.08	0

^aValues are expressed as No. (%).**Table 2.** The Frequency of Different Events that Led to Calls to 24 Bases and Quadruplet Areas^a

Kinds of Events	Age Classification					
	Unknown	0 - 10	11 - 20	21 - 40	41 - 60	More than 60
Accidents	26.70	1.64	8.06	47.50	12.60	3.50
Stab wound	30.19	0.24	5.28	50.02	12.09	2.18
Downfall	23.27	1.84	10.18	47.48	12.57	4.36
Burning	28.70	2.34	2.62	39.51	21.16	5.59
Poisoning with CO	17.66	7.46	12.39	42.54	15.56	4.19

^aValues are expressed as No. (%).

due to falls and 2.2% due to burns (11). This aforementioned result, accorded with Rafiei *et al.* which showed the most misfortune was due to road traffic accident, violence, suicide, poisoning, falling, hit and burn injury (12). The present study also showed, the Road Traffic Accidents RTA as the most common cause for injuries. This latter consequence was in concurrence with previous reports (11-15). Also, present study showed, injuries occurred mostly in people aged 21-40 years. This latter result was similar to other publications (12, 13, 16). These issues' outcome may be discuss the reasoning for the risky age group [21-35]. The

men incidences may relate to them being at greater risks of their activities of daily life such as using more vehicles, and are more exposed to more jeopardies. Moreover, results showed, as accidents (34.6%), downfall (48.6%) and burning (37.5%) are more common among women while stab wound (37.5%) and poisoning with CO (42.2%), more common among men. In Rafiei *et al.* study demonstrated, the majority of injuries were men and about half of the injuries were due to road traffic accidents and the most injuries among male were RTA and violence, in female RTA and Suicide (12). This survey in different Tehran's four area

EMS Missions Types in Different Parts of Tehran in 2012 (Road Traffic Accidents are Not Included)

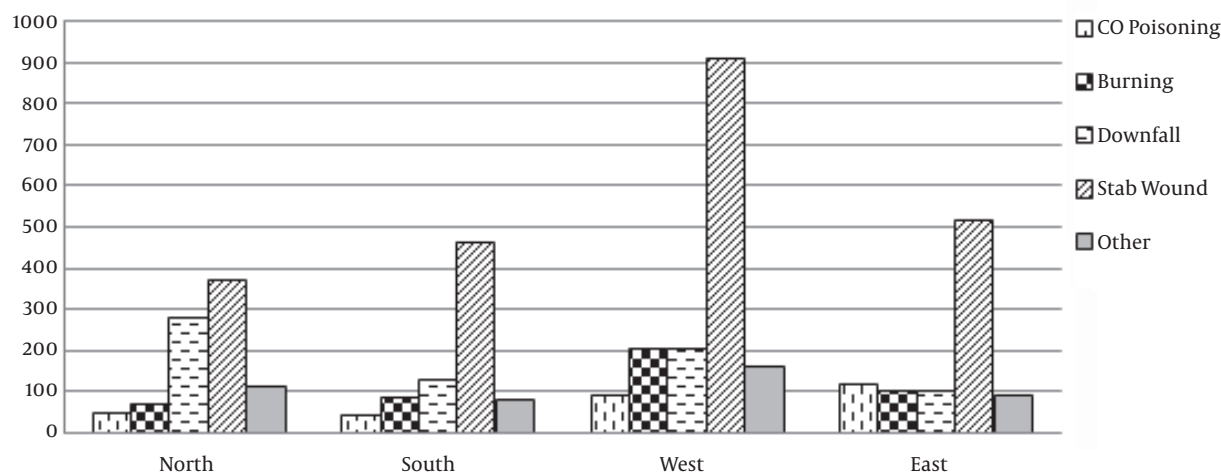


Figure 1. A Schematic View of Events Frequency at 24 Bases

zones has indicated, the RTA and downfall in the Northern, stab wound and burning in Western, and poisoning with CO in Eastern neighborhood, had the most significant frequency in contrast with each other. Tehran is a megacity and the socio-economic status of the living people is varies in different zone of the city, so the differences in the frequency of accidents in the zones are predictable. Farchi et al. showed that lifestyle traits of young Greek drivers is an important factor on the frequency of RTA. They even discussed that the risk of injury is lower in religious driver in comparison with non-religious ones (17).

4.1. Conclusion

According to investigation findings it is suggested that EMS management system and policy makers need exact statistics of types of events for effective programming to improve emergency Services. Considering the epidemiology of accidents in different area for response planning is highly suggested and referral hospitals should be distributed accordingly. It is recommended for future researches to perform social studies based on the causes of high levels of these events in different areas, such as high frequency of accidents in Northern areas and burning in Western areas. Finally, it is recommended that specialized centers of trauma and burning centers with uniform distribution should be constructed in order to facilitate pre-hospital emergency.

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Footnotes

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