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Electric shock in patients administered to hospital: a descriptive study

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Brief Communication

Electric shock is one of the major causes of death in developing countries (1,2). It results from the direct contact of any source of electricity with the human body that causes sufficient current through the skin, muscle or hair. The expression is described as injurious exposure to electricity. This type of injury is mostly classified as the work related fatalities and injuries, whether legal or illegal works (3). To date, we are unaware of any study describing the demographic and characteristics of electrical shock victims referring to the hospitals of Iran. This information may lead to providing a better insight for the treatment and management of these patients and developing better preventive strategies for those at higher risk of electrical shocks.

We performed a descriptive study on 95 patients referring to the Hafte-Tir hospital, affiliated to Iran University of Medical Sciences, in Tehran with the complaint of electrical shock. The study was conducted from January 2011 to January 2013. The inclusion criterion was admission due to the history of electrical shock. Exclusion criteria were as follows: past history of other diseases such as cardiac, pulmonary and central nervous system diseases and drug or alcohol abuse. Demographic and anthropometric information of all participants including age, sex, route of exposure, entrance site and exit site were recorded for all the cases. A questionnaire studying the underlying factors for the accident as well Glasgow Coma Scale (GCS), outcome, type of electricity and admission duration was filled for all the cases. Illegal exposures to electricity including suicide, murder or during stealing from other places were also recorded. The patient's guardian was asked for written informed consent before participation. The patients were also asked for inclusion in the study before participation. The study was approved by the local ethics committee of the hospital. All the procedures and steps of the study were performed according to the declaration of Helsinki.

The primary characteristics of the participants are presented in Table 1. The participants included 95 patients who were 26-45 years of age. Most of the accidents took place out of home and due to illegal exposure to electricity. The gap between the accident and hospital admission was between 30 minutes to 2 hours. The entrance place

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Table 1. Presenting the Characteristics of the Participants

Age Groups		Frequency	Percent	Valid Percent	Cumulative Percent
	6-20	11	11.6	12.0	12.0
	21-25	18	18.9	19.6	31.5
	26-35	26	27.4	28.3	59.8
	36-45	25	26.3	27.2	87.0
	46-55	6	6.3	6.5	93.5
	56-100	6	6.3	6.5	100.0
Hospital admission	Emergency	75	78.9	78.9	78.9
	Private	20	21.1	21.1	100.0
Place of accident	Home	11	11.6	11.6	11.6
	Out of Home	84	88.4	88.4	100.0
The route of accident	Car crash	31	32.6	32.6	32.6
	Legal	29	30.5	30.5	63.2
	Illegal	35	36.8	36.8	100.0
Place of exposure	Home	26	27.4	27.4	27.4
	Between cities	24	25.3	25.3	52.6
	In cities	45	47.4	47.4	100.0
Season of the accident	Spring	30	31.6	31.6	31.6
	Summer	29	30.5	30.5	62.1
	Autumn	13	13.7	13.7	75.8
	Winter	23	24.2	24.2	100.0
Time gap between accident and hospital admission	Less than 30 minutes	7	7.4	7.4	7.4
	30minutes to 2hours	82	86.3	86.3	93.7
	More than 2 hours	6	6.3	6.3	100.0
Being Alive	Alive	94	98.9	98.9	98.9
	Dead	1	1.1	1.1	100.0
Entrance Place	Head and Neck	18	18.9	19.1	19.1
	Hand	64	67.4	68.1	87.2
	Chest and abdomen	9	9.5	9.6	96.8
	Legs	3	3.2	3.2	100.0
Exit Place	Hand	30	31.6	47.6	47.6
	Chest and Abdomen	14	14.7	22.2	69.8
	Legs	19	20.0	30.2	100.0
GCS (Glasgow Coma Scale)	8>	9	9.5	10.5	10.5
	8-10	10	10.5	11.6	22.1
	11-13	4	4.2	4.7	26.7
	14-15	63	66.3	73.3	100.0
Gender	male	91	95.8	95.8	95.8
	female	4	4.2	4.2	100.0
Admission Duration	0-7	33	34.7	34.7	34.7
	8-14	26	27.4	27.4	62.1
	15-21	13	13.7	13.7	75.8
	22-30	11	11.6	11.6	87.4
	31<	12	12.6	12.6	100.0

was the hand and the exit place was also the hand in most of the cases. The patients had a normal Glasgow Coma Scale (GCS) on admission (63/95), and they were mostly male (91/95). One of the patients who reached the hospital died during the admission.

Our findings revealed that young people are at a higher risk of electrical injury compared to other age population due to the illigal use of the electricity due to their need. In this study, it was also revealed that the death rate was nearly 1% among the admitted patients. In other words, the victims of electrical shock often die at the scene, but if the victims can arrive at the hospital alive, then the chances of survival will be high. This is the first report of electrical injury victims in Iran.

In 1993, there were 550 electrocutions in the US, which caused 2.1 deaths per million inhabitants (4). The incidence of electrocutions is decreasing (electrocutions in the workplace make up the majority of these fatalities), but new jobs provide more hazards for the workers (1, 2, 5-9). Large funds are provided to prevent fatality by electrocauion (10).

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In this study, the most frequent cause of electrocution was stealing electricity which mostly happened in the spring and summer. Considering that this study was conducted in the southern region of Tehran, an active industrial area in which many young workers work, it is not surprising to find that electric shocks occur with a high rate in young people in warm seasons.

The principal limitation of the present study was its cross sectional nature, which precludes the determination of the direction of causality; however, we took advantage of the large sample size and the close similarity between the groups in most of the potentially confounding variables.

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