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LATEST ARTICLES

Emergency Access and Impact of Injuries Caused by Electrocution and Lightning

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Abstract

Electrical injury is a physiological reaction caused by electric current passing through the body. Electric injuries can be caused by the impact and exposure to electric current or lightning either at home or at work.

The injury depends on the density of the current, tissue resistance, and duration of contact. Very small currents may be imperceptible or produce a light tingling sensation. Injuries can range from minor, moderate, to severe, and fatal injuries are just as likely to occur at home as in the workplace, with around 20 Australians dying each year from electric shock.

The purpose of this paper is to study how well-trained healthcare professionals in both pre-hospital and hospital settings are in treating patients in the case of electric shock and injuries caused by lightning, including the triage, assessment, monitoring, treatment, and transport with medical care in pre-hospital settings

The research was conducted based on data obtained from assessments of health care professionals based on anamnestic data, the status of vital parameters, monitoring, medical procedures, system-level injuries, type of health care delivery, and location.

Conclusions: Given the discrepancies found in reporting pathological conditions and injuries pertaining to electrical burn wounds, a standardized system for classifying these pathological conditions is suggested. Although electric shock-related mortality is not the leading cause of death in high-prevalence areas, awareness needs to be raised.

Keywords: Electrical injury, triage, assessment, monitoring, treatment, medical care

Introduction

Electrical injury is a physiological reaction caused by electric current passing through the body.[1, 2] The injury depends on the density of the current, tissue resistance and duration of contact.[3]

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Very small currents may be imperceptible or produce only a light tingling sensation. [4]

A shock caused by a low and otherwise harmless current can startle an individual and cause injury due to pulling or falling. Stronger currents can cause discomfort or pain, while more intense currents can cause involuntary muscle contractions, preventing the person from freeing themselves from the source of electricity. [5]

Even larger currents result in tissue damage and can cause ventricular fibrillation or cardiac arrest. Consequences of electric shock can include amputations, bone fractures, and orthopaedic and musculoskeletal injuries [5]

If death results from an electric shock, the cause of death is generally called electrocution. [2].

Epidemiology. Electrical injuries affect more than 30,000 people a year in the United States and result in about 1,000 deaths. In 1993, 550 electrocutions were reported in the US, 2.1 deaths per million population. At that time, cases of electrocution were on the decline. [1]

Electrocutions in the hard injuries in the workplace fell 23% between 2015 and 2019 from 2,480 to 1,900. In 2019, the top 5 states with the most electrical workplace fatalities were: (1) Texas (608); (2) California (451); (3) Floridlace account for the majority of these deaths. From 1980-1992, an average of 411 workers were electrocuted each year. [1]

Causes. Electric shock occurs when a person comes into direct contact with a high-voltage current , which then passes through the body. Several things can cause electric shock, including: Being struck by lightning, coming into contact with downed power lines, putting fingers or objects into an electrical outlet, touching damaged or broken cables or electrical equipment, and touching plugs. overloaded electrical. Electric shocks can cause ventricular arrhythmias, asystole, or death. In addition, respiratory muscle tetany as a result of contact with electricity can cause hypoxic cardiac arrest and death. Much of the morbidity which results from electrical injury is associated with burns and neurological dysfunction.[6]

Pathophysiology The minimum current that a human can feel depends on the type of current (AC or DC) as well as the frequency for AC. A person can feel electric current up to 1 mA for 60 Hz AC and up to 5 mA for DC. At about 10 mA, DC current passing through the arm of a 68-kilogram (150 lb) man can cause powerful muscle contraction; the victim is unable to voluntarily control muscles and cannot release an electrified object. This is known as the “release threshold” and is a criterion for shock hazard in electrical regulations. [1]

The extent of damage of tissues depends on the intensity and the continuance of the heating. Electricity generates more heat in less conductive tissues.[7]

The current, if high enough and delivered with sufficient voltage, can cause tissue damage, fibrillation, or cardiac arrest; more than 30 mA [7] AC (rms, 60 Hz) or 300 – 500 mA DC at high voltage can cause fibrillation. A sustained AC electric shock at 120 V, 60 Hz is a particularly dangerous source of ventricular fibrillation because it usually exceeds the release threshold while not delivering enough initial energy to move the person away from the source. However, the potential seriousness of the shock depends on the paths through the body that the currents take.[8] If the voltage is less than 200 V, then the human skin, more precisely the stratum corneum, is the main contributor to the impedance of the body in the case of a macro shock - the passage of current between two contact points on the skin. However, skin characteristics are non-linear.

If the voltage is above 450–600 V, then dielectric breakdown of the skin occurs. The protection provided by the skin is reduced by sweat, and this is accelerated if the electricity causes the muscles to contract above the release threshold for a sustained period of time. If an electrical circuit is created by electrodes inserted into the body, bypassing the skin, then the potential for death is much higher than if a circuit is placed through the heart. This is known as a micro shock. Currents of only 10 µA may be sufficient to cause fibrillation in this case with a probability of 0.2%. [1]

Macroshock entry point: Current across intact skin or touching the body, from arm to arm, or between an arm and a leg, can attack the heart, so it is much more dangerous than current between the leg and the ground. This type of shock by definition must pass into the body through the skin.

Microshock: Very small current source with a path connected directly to heart tissue. This is a mostly theoretical risk since modern equipment used in these situations includes protection against such currents. [10] [11].

Signs and symptoms.

Signs and symptoms of electric shock can vary depending on the type and amount of electrical voltage such as:

- Numbness and tingling
- Burns
- Convulsions
- Irregular heartbeat
- Irregular or difficult breathing
- Vision or hearing problems
- Muscle spasms
- Headache
- Loss of consciousness
- Cardiac arrest

Symptoms caused by touching a broken kitchen appliance cord are usually much less severe than those caused by higher voltage shocks from sources such as power lines or lightning.

Clinical evaluation. Cardiac dysrhythmias. TV, VF, AC are malignant dysrhythmias of the cardiac rhythm, and many other dysrhythmias can appear, such as; atrial fibrillation, atrial tachycardia, lead rhythms, with TSV, 1st and 2nd degree heart blocks and ventricular premature beats. ST segment abnormalities may be evident and usually resolve spontaneously. Coronary artery spasm and thrombosis can cause ischemia and myocardial infarction. Post-mortem studies demonstrate a variety of cardiac anatomical changes after electrical shock including widespread focal necrosis of the myocardium and specialized tissues such as the atrio-ventricular and sinoatrial nodes [1].

Respiratory system. Electric current can cause apnoea through tetany of the respiratory muscles or through interruption of the normal cyclic output of the respiratory center in the brainstem.

Skin burns. Skin burns are often full-thickness involving the typical entry and exit sites of the topical route, such as the hands and feet. Skin burns may have a relatively small surface area and may lead to underestimation of internal burns produced by the current pathway.

Peripheral neurological features. Electrical exposure can result in high current densities within nerve tissue, causing significant damage. Effects can be immediate or delayed with paraesthesia and weakness. The ulnar and median nerves are commonly involved with injuries to the hand.

Characteristics of the Central Nervous System. The application of electric current to the brain can cause loss of consciousness, confusion and amnesia, and/or convulsive attacks. A wide variety of neurological findings may be present such as hemiparesis, speech and visual disturbances. Involvement of the spinal cord may result in tetraplegia and paraplegia which may be transient or permanent. The incidence of spinal cord injury after high voltage electrical accidents varies between 2 and 27% [2].

Musculoskeletal characteristics. Deep muscle burns can cause contractures and deformities. Marked skeletal muscle necrosis can cause electrolyte abnormalities, myoglobinuria, and kidney damage. Oedema of the muscles within the myofascial sheaths can cause compartment syndrome. The gradation of tissues from most conductive to least conductive is as follows: neural tissue, blood vessels, muscles, skin, adipose tissue, bones[12].

Muscle tetany typically occurs in response to electrical stimulation at a frequency of 40 Hz to 110 Hz, a range in which most household currents exist. If this muscle contraction occurs in the hand, contraction of flexors will cause the affected individual to grasp the source and prolong contact with the electrical source.[1]

The legs. A photo showing a classic burn injury. There are two types of incoming burns on the palms from the electrical source and an exiting burn on the feet.

Secondary trauma can result from being thrown from the electrical source. Violent muscle contraction can cause fractures and dislocations especially around the shoulder girdle (e.g., characteristic posterior dislocation of the shoulder). Opisthotonos can produce vertebral fractures with secondary cord injury or cauda equina.

Features in the eye. Passage of current through or adjacent to the eye can cause burns to the cornea, sclera or deeper structures. Cataract formation is a delayed consequence of lens involvement.

Vascular injuries. Involvement of blood vessels in the current pathway can cause vascular spasm and thrombosis with possible distal ischemia. Delayed aneurysm formation can result in damage to the vessel wall. Intramural burns. Intraoral burns are more common in young children, particularly with toddlers exploring electrical household appliances or cables by placing them in mouth. Conduction of current may be aided by electrolyte-rich saliva. Delayed haemorrhage is a well-known feature of intra-oral electrical burns. Haemostasis may initially appear satisfactory, but as the temporary current-induced vasospasm resolves, severe haemorrhage may result. Shrinkage of scar tissue has the potential to make intraoral burns particularly disfiguring. Effects on the foetus Amniotic fluid easily conducts electricity. If the gravid uterus is involved in the electrical pathway, the effects on the foetus can be devastating. Maternal cardiac arrest and dysrhythmias also compromise uteroplacental blood flow.

Emergency medical care. When electrocution occurs outdoors, treatment may also include steps to ensure the area is safe beforehand and how to help the victim. Visually examine the victim but do not touch them, otherwise you may endanger yourself by electrocuting yourself if they are still connected to the power source. Call EMS or have someone else call EMS 112. Check for a source of electricity and turn it off if possible. If this is not possible, use an object made of non-conductive material, such as wood or plastic. When you are sure that you are safe from electric shock, check the victim's breathing and pulse.

Begin cardiopulmonary resuscitation (CPR) immediately if cardiac arrest occurs. If the victim is breathing but appears to have fainted or has other signs of shock, place the victim in a prone position on the ground and elevate the legs in the Trendelenburg position.

Do not treat any burns or remove clothing and wait until EMS 112 arrives.

If a person or child experiences an electric shock at home, contact your health care provider, paediatrician or call EMS 112.

In some cases, the shock can cause internal damage that cannot be detected visually. A health care provider can evaluate for superficial burns, mouth burns, or other internal organ injuries. If the person has severe burns, they may need to be hospitalized for treatment and observation. [13]

Medical care for electric shock will depend on the amount of voltage involved. A minor incidence of electric shock may not require medical attention. Treatment for less severe incidents of electric shock may include pain medications, antibiotic ointments, and cleaning bandages for minor burns. Higher tension injuries will require a higher level of medical care and often have poorer survival outcomes.

Emergency medical care may require: Cardiopulmonary resuscitation, MIQ care, IV fluids, surgical monitoring and continuous observation. If you or a friend experiences an electric shock, it is important to be examined by a health care provider. Injuries from an electric shock depend on the voltage level, the source, the way it passed through the body, the person's age and general health. When to call EMS 112 if a person has been electrocuted when the patient has: Irregular heartbeat, muscle pain or muscle contractions, confusion, breathing problems, cardiac arrest, convulsions, and/ or loss of consciousness.[14, 15]

Preventing. Best practices to prevent electric shock at home include: Cover all outlets, make sure the wires are properly insulated and covered. Keep cords out of reach of children; supervise children in areas with potential electrical hazards, such as electrical equipment near a bathtub or pool. Turn off the breaker when working with electricity in the house. Do not use electrical appliances in the bathroom or shower. In addition, there are several ways to prevent electrocution outside the home, including: Report any downed or broken power lines to your power company immediately; do not touch them under any circumstances. Do not drive or walk-through water if power lines may have fallen into the water. If you are in contact with an electrical source while in a car, stay in your car and get away if possible. If you are unable to leave, stay in your vehicle and call EMS 112. Wait for emergency services to arrive and do not let anyone near your vehicle. Call an electrician to fix electrical circuits that are wet or near water. If possible, turn off the power at the main breaker, but never step into standing water to access it.

Never work on or near an electrical source while standing in water, especially if using a power tool. Make sure electrical equipment is completely dry before restoring power. Have a certified electrician confirm that it is safe to turn the power back on. Turn off your main breaker if there is a burning smell but no obvious source, or if you can see sparks and broken wires when you turn the power back on. When installing or using a generator, talk to your utility company about usage. Do not use generators without approved automatic shut-off devices. Generators can be a fire hazard if they remain plugged in once power is restored.

Purpose of the work

The purpose of this paper is how well health care professionals are prepared in prehospital hospital environments in case of electric shock and lightning as in rapid triage, assessment, monitoring, treatment, care and transport with medical care in prehospital environments. Our research also evaluates the medical care professionals in non-hospital education and their training, quality of care, and skills in the implementation of CPR methods as well as general medical care. Also, did they know and professional skills with the basic courses of Basic Life Support® (BLS®), Advanced Cardiac Life Support and Basic Trauma Life Support® (BTLS®) [16, 17]

Objectives

Demonstrate ability to assess and manage emergency airway, breathing and circulation, in burns patients. Use a defibrillator if it's necessary, and administer appropriate therapy.

Formulate a list of possible diagnoses and prioritize the assessment elements, in this situations.

Build a disposition plan after stabilization in the emergency department, until will transfer to the definitive treatment.

Material and Methods

The research material was taken from the archive of the Emergency Clinic, UCCK for the period January-December 2022. The research is retrospective, descriptive, qualitative. In the research, patients of all age groups exposed to electric current and lightning as well as health care professionals were taken in relation to basic and advanced health care courses.

Specialty	**Local Trauma centre**	**Regional Trauma centre**	**University Clinical Centre ED - Trauma centre**
Emergency doctor	X	X	X
Trauma surgery/orthopaedics + special trauma surgery	X	X	X
Anaesthesiology	X	X	X
Vascular surgery			
General surgery	X	X	X
Radiology	X	X	X
Neurosurgery		X	X
Vascular surgery		X	X
Thoracic surgery			X
Otorhinolaryngology			X
Ophthalmology			X
Oral and maxillofacial surgery			X
Urology			X
Cardiac surgery			X
Paediatrics/paediatric surgery			optional
Gynaecology			optional
Burn centres			X

Table 1. Distribution of specialist doctors according to the level of emergency hospital service

a. Data collection methods and techniques

The research material was taken from the archive of the Emergency Clinic, UCCK for the period January - December 2022. The research is retrospective, descriptive, qualitative. All age groups exposed to electric current and lightning as well as health care professionals were taken in the research. The research was conducted on the basis of data obtained from the evaluations of health care professionals based on anamnestic data, the status of vital parameters, monitoring, medical procedures, injuries at the level of systems, type of health care provision and location.(tab. 1)

Protocols, updated interdisciplinary strategies and data analysis can provide knowledge of organizational structures and sufficient levels of effective medical staff for the management of multiple incidents in order to minimize the loss of life.

Access of multiple views in EMS 112, it is those in pre-hospital and emergency hospital environments that provide the layers of response which require a professionalized medical approach, treatment procedures and actions that help the process at all stages of the topic with an organized health system in terms of comprehensive plan by optimizing the process from the first phase. (NHTS, 2019). [16]

Description of the sample. In the sample, 52 cases were investigated who had contact or injuries from electric current and lightning strikes, investigating all age groups. The research was conducted on the basis of data obtained from the evaluations of health care professionals based on anamnestic data, the status of vital parameters, monitoring, medical procedures, injuries at the level of systems, type of health care provision and location.

Description of data processing. The description of data processing is realized through statistical parameters, (worked Excel Word) structure index, arithmetic mean and standard deviation. Statistical tests: X2-test and T- test. The verification of the tests was done for the confidence level of 95% and 99%, respectively for p<0.01 and p<0.05.

Results

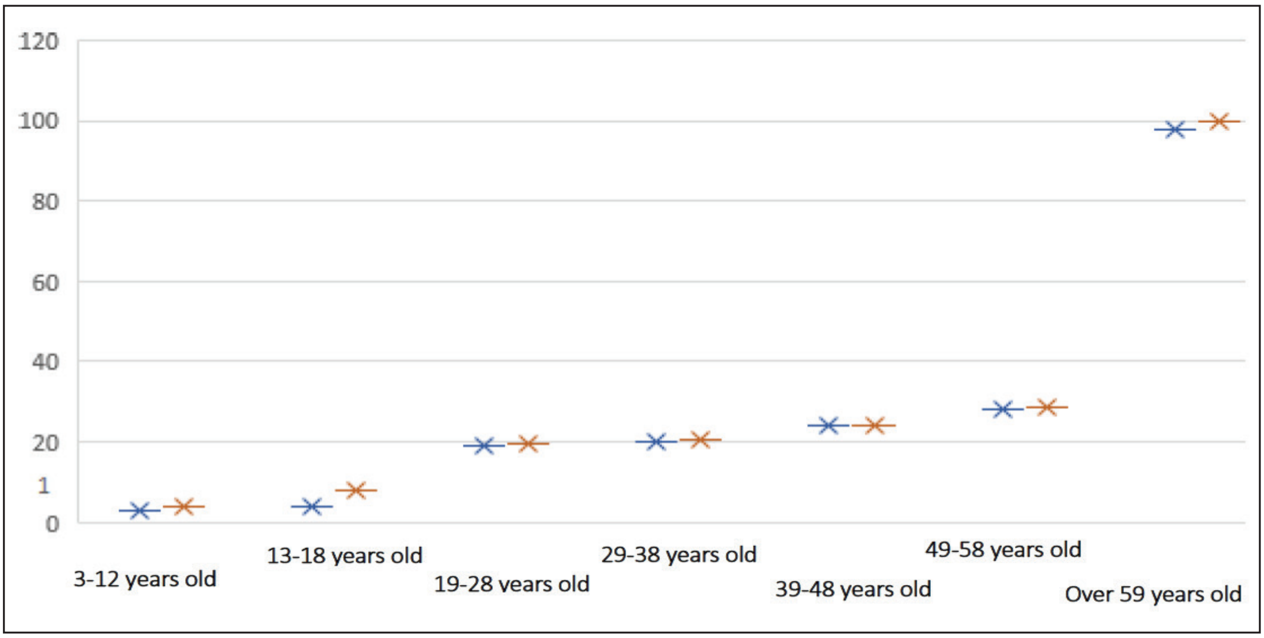
The research material was taken from the archive of the Emergency clinic, UCCK for the period January - December 2022. The research is retrospective, descriptive, and qualitative. All age groups exposed to electric current and lightning, as well as health care professionals, were taken in the research. The research was conducted on the basis of data obtained from the evaluations of health care professionals based on anamnestic data, the status of vital parameters, monitoring, medical procedures, injuries at the level of systems, type of health care provision and location.

In the research, 98 cases caused by electric shock and lightning were treated at the Emergency Clinic, UCCK for the period January-December 2022. The total number of patients seen in UCCK during this time was 78,200 and cases of electrical injuries were 98 cases or 0.12%.

In our study we have these epidemiological data, from the total number according to gender, there were 70 cases or 71.42% of men and 28 cases or 28.58% of women.

The average age of the patients included in the research was 1-10 years, the youngest patient was over 3 years and the oldest was over 59 years. (Graph 1.).

According the distribution of cases by diseases and injuries, we had 22 cases or 42.3% of burns without supplementary injury, and burns with accompanying



Graphic 1. Number of cases by age group.

injury two or more had 30 cases or 51.7%, in this group we have this distribution as follow 20 cases of upper extremity fractures, 7 cases of lower extremity fractures; 9 cases of head injuries; 6 cases of chest injuries; abdominal injuries were 4 cases; spinal cord injuries were 2 cases;,ventricular tachycardia was 8 cases; ventricular fibrillation was 2 cases; and me was 3 cases. (Tab. 2)

Illness / Injuries	No.of cases	%
Burns without supplementary injury	22	42.3
Burns with accompanying injury two or more	30	51.7
Total	52	100
Burns with accompanying injury two or more		
Fractures of the upper extremities	20	66.6
Fractures of the lower extremities	7	23.33
Head injuries	9	30.00
Chest injuries	6	20.00
Abdominal injuries	4	13.33
Spinal cord injuries	2	6.66
Pelvic injuries	2	6.66
Ventricular tachycardia	8	26.66
Ventricular fibrillation	2	6.66
Cardiac arrest	3	10.04
Total	30	

Table 2. The distribution of cases by diseases and injuries.

The article also includes an assessment of the percentage of the body affected by the burn and its depth, where we use this burn classification as follows [18]:

- **Minor:** First- and second-degree burns that cover less than 10% of the body are considered minor and rarely require hospitalization.
- **Moderate:** Second-degree burns that cover about 10% of the body are classified as moderate. Burns on the hands, feet, face or genitals can range from moderate to severe.
- **Severe:** Third-degree burns that cover more than 1% of the body are considered severe.

The number of cases according to the severity of diseases/injuries, with minor injuries were 13 cases or 25 %, mederate were 28 cases or 53.8 %, with serious injuries were 11 cases or 21.2%. (Tab. 3)

Severity of injuries	No.ofcases	%
Minor	13	25
Moderate	28	53.8
Serious	11	21.2
Total	52	100

Table 3. Number of cases according to severity of diseases/injuries.

The distribution of cases according to the assessment of vital signs (Hemodynamic Status), stable were 69 cases or 70.40% and unstable were 12 cases or 29.59%. (Tab. 4).

Hemodynamic Status	No.of cases	%
Stable	69	70.40
Nostable	29	29.59
Total	98	100

Table 4. Number of cases according to Hemodynamic Status

Out of the total number of 98 cases of electrocution. Numbness and tingling were 14 cases or 14.28%; Burns were 10 cases or 10.20%; Convulsions were 2 cases or 2.04%; Irregular heart beat was 24 cases or 24.48%; Vision or hearing problems were 7 cases or 7.14 %; Muscle spasms were 5 cases or 5.10 %; headache 21 cases or 21.42 %; and with fatigue paleness were 15 cases 15.30 %. (Tab.5).

According to signs and symptoms	No. ofcases	%
Numbness and tingling	14	14,28
Burns	10	10.20
Convulsions	2	2.04
Irregular heartbeats	24	24.48
Vision or hearing problems	7	7.14
Muscle spasms	5	5.10
Headache	21	21.42
fatigue paleness	15	15.30
Total	98	100.0

Table 5. Number of cases according to signs and symptoms.

From the total number of 98 cases that requested emergency medical help and care; BLS were 54 cases or 55.10 %, ACLS were 15 cases or 15.30 %, BTLS were 15 cases or 15.30 and ATLS 14 cases or 14.28 %, (Tab. 6).

Type of medicalcare	No. of cases	%
BLS	54	55.10
ACLS	15	15.30
BTLS	15	15.30
ATLS	14	14.28
Total	98	100
BLS® - Basic Life Support; ACLS® - Advanced Cardiac Life Support; BLTS ® - Basic Trauma Life Support; ATLS® - Advanced Trauma Life Support;		

Table 6. Type of medical care.

The total number of 98 cases with problems of conscience; with conscience there were 88 cases or 89.79% and without consciousness there were 10 cases or 10.21%. The number of cases with complications;

Complications 28 cases or 28.57% and No complications 70 cases or 71.43%. The distribution according the mode of treatment were the number of cases sent to the hospital or discharged home; 33 cases or 33. 67 % and 65 cases or 66.33 % (Tab. 7).

	No.of cases	%
With disorders of conscience		
o Consciously	88	89.79
o Without conscience	10	10.21
Complications		
o Yes	28	28.57
o No	70	71.43
Mode of treatment		
o Hospitalized	33	33.67
o House.	65	66.33
Total	98	100

Table 7. Distribution of data according the conscience, Complications, and mode of treatments

Discussion

The discussion surrounding emergency access and the impact of injuries caused by electrocution and lightning is an important topic in the field of emergency medicine and public safety.

Electrocution and lightning-related injuries can have severe consequences, including organ damage, burns, neurological impairments, and even death.

In this discussion, we can explore various aspects related to emergency access and the impact of such injuries.[19]

Prehospital care is an essential part of the emergency health care continuum that is often initiated by a 122 call to a dispatch center.

Routinely, the need for emergency care is determined by trained personnel who receive such a call and dispatch the appropriate air and ground ambulances and other EMS responders to triage, treat, and transport the patient(s) to the appropriate care facility. healthcare, where final care is provided at the end.

This continuum of conventional care is provided through a coordinated and integrated emergency health care system with well-trained and well-equipped personnel in dispatch centers, ambulance agencies, hospitals and specialized care centers (trauma, burn, pediatric) using standardized protocols and guidelines. approved by medical directors [20]

This emergency healthcare system will be stressed to its limits during a mass casualty incident. Dispatch and regional call centers, local EMS agencies, and hospitals will take emergency measures utilizing their emergency operations plans and approved medical protocols to implement enhanced medical capabilities [21]

These measures may include

- Public safety answering points (PSAPs) and call centers that change their dispatch protocols dispatch fewer resources and allow EMS providers to respond to fewer calls for assistance [21]; transport destinations are being adjusted to allow transport to clinics or other alternative care sites other than hospitals [22]
- EMS personnel using disaster triage systems (sort, assess, life-saving interventions, treatment/transport; simple triage and rapid treatment [START]; and JumpSTART triage methods) so they can assess patients within 60 seconds and categorize them for immediate or delayed care [23, 24]
- EMS personnel using the National Incident Management System (NIMS) incident command system (ICS), which provides a consistent model for all organizations involved in disaster response.

In the event of a mass casualty incident in which emergency health care personnel, medical equipment and transportation, and hospital beds are in short supply, local EMS personnel will be forced to modify their care from conventional to crisis care.

This means moving from usual standards of care, in which the goal is to save everyone, to CSC, in which as many lives as possible are saved with the resources available.

Emergency access and response time: Prompt access to emergency medical services is crucial in cases of electrocution and lightning injuries. The ability to quickly reach the site of the incident, assess the situation, and provide appropriate medical care can significantly impact patient outcomes. Factors such as geographic location, infrastructure, transportation availability, and communication systems can influence response times and access to medical assistance.[25]

Training and preparedness: Healthcare providers, emergency responders, and community members should receive appropriate training to recognize and respond effectively to electrocution and lightning-related injuries. This includes knowledge about cardiopulmonary resuscitation (CPR), basic life support (BLS), and advanced cardiac life support (ACLS), as well as understanding the unique aspects of managing electrical and lightning injuries.[26, 27]

Medical management: Treating electrocution and lightning injuries requires a multidisciplinary approach. Medical interventions may include resuscitation, wound care, pain management, cardiac monitoring, neurological assessment, and treatment of associated injuries. In severe cases, specialized burn centers or trauma centers may be required for optimal care.

Prevention strategies: While emergency access and timely intervention are crucial, efforts should also focus on preventive measures. Public awareness campaigns, safety guidelines, and regulations regarding electrical safety and lightning protection can help minimize the occurrence of such injuries. These initiatives should target both the general public and specific high-risk groups, such as outdoor workers, athletes, and individuals working with electrical equipment. [28]

Robust data collection and analysis can help identify trends, develop evidence-based guidelines, and improve prevention strategies. Collaborative efforts between emergency medicine, public health, and engineering disciplines can contribute to a comprehensive understanding of these injuries. [29]

Conclusion:

The discussion on emergency access and the impact of injuries caused by electrocution and lightning is essential for improving patient outcomes and developing effective prevention strategies. By addressing factors such as response time, training, medical management, prevention efforts, and research collaboration, we can work towards reducing the burden of these injuries and improving emergency care for affected individuals.

Recommendations

To institutionally support the advancement and strengthening of the health system at the primary, secondary and tertiary level, triage as an important component in the management of accidental situations

To design clinical guidelines, algorithms and triage protocols at the three levels of health care.

All health care professionals should be educated, trained with continuing courses in triage, communication, Basic Life Support -AED, ACLS, PHTLS. BTLS. ATLS.

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