

Electrotraumatic Damage (Pathophysiological Aspects)

Latipova Sitora Baxodirovna

Bukhara State Medical Institute

Article Information

Received: March 23, 2023

Accepted: April 22, 2023

Published: May 25, 2023

Keywords

electric current, electrical

injury, potentially severe

patients.

ABSTRACT

As a result of the analysis of the medical records of stationary patients with electro-traumatic lesions, the peculiarities of the electric trauma are revealed: prevalence of deviations of the central nervous system, cardiovascular system and blood system. Peaks of changes of these systems are established.

Introduction

The ever-increasing use of electricity creates conditions for increasing cases of electric shock - electrical injury [1, 5]. Number affected from electricity is 2-3 human on 100 000 population V year.

Electric current, interacting with the human body, is capable of causing a series of pathological changes V work various systems: nervous cordially- vascular, respiratory [1, 3]. The pathogenesis of these disorders is quite complex. There are complex and combined injuries, deep burns occur, which often are cause of disability And of death [2, 4].

Purpose: to identify and study the features of the clinical picture in patients with electrical injury with taking into account materials, provided burn department UZ "Brest regional hospital".

Tasks:

1. Reveal changes in the systems and structures of the body, based on shifts laboratory parameters and deviations identified using functional and hardware research.
2. Analyze the dynamics of changes in laboratory and instrumental indicators at patients with electrotraumatic defeats.
3. Describe characteristic clinical signs at patients with electrotraumatic defeats.

Materials and methods. Were analyzed 53 medical cards stationary patients burn branches And branches resuscitation And intensive care unit of the Brest Regional Hospital in the period from 2014 to 2017 years inclusive. Received results were processed methods nonparametric statistics.

Results and their discussion. Among selected medical kart at 23 patients installed electrical injury co specific clinical manifestations And the formation of electrical loops current.

The remaining 27 patients had electrothermal flame burns. skin covers varying degrees And depth of injury.

Three patients injured by electric shock died in department resuscitation V result occurrence And growth symptoms multiple organ insufficiency: syndrome systemic inflammatory answer, acute renal, cardiac and hepatic insufficiency, disorders of the central nervous systems.

IN result conducted analysis were revealed changes co sides:

1. systems blood circulation (100%);
2. cardiovascular systems (74%);
3. nervous systems (34.7%).

Moreover, at patients With changes co sides cardiovascular And nervous systems loops current affected two most important body our organism - heart and brain.

So sides laboratory indicators identified the following violations:

1. General analysis blood: V first three days after receiving injury celebrated raise hemoglobin, hematocrit And quantities erythrocytes. WITH moment receiving injury appears leukocytosis, increases shift leukocyte formulas left, What speaks O inflammatory process V body. ESR and platelets increase over a longer period of time and reach their peak at 8-12 days. In severe cases, thrombocytosis following minor thrombocytopenia, which may indicate violation blood coagulation system (T. e. hypercoagulation).

All this indicates a systemic violation of the rheological properties of blood, and exactly - on thickening blood. violated viscosity And fluidity blood, What promotes deterioration microcirculation And, respectively, blood supply fabrics and domestic organs.

2. Biochemical analysis of blood: an increase in the concentration of glucose in the blood speaks O massive ejection glycogen from liver V result stressful conditions, hyperproteinemia and hyperalbuminemia in the first three days can also indicate a thickening of the blood, which, perhaps, is a compensatory reaction organism And insufficient infusion therapy at extensive lesions. Appear shifts V quantity trace elements - increases content potassium And, V lesser degree sodium, calcium decreases.

On days 2-3, there is an increase in ASAT (in 59% of patients) and ALAT (in 37% of patients). patients), increases bilirubin (general And straight). All This indicates on growing functional failure liver.

3. Cardiocomplex: was taken at limited quantities patients (3 human) due to the presence of cardiac symptoms and serious violations on the ECG.

Are celebrated shifts all indicators:

- 1) CK-MB: rises to 70 U/l (norm: 0.0-4.3 U/l);
- 2) isincreasing cardiospecific troponin I;
- 3). myoglobin rises V 5 once And more;
- 4). Appears D-dimer (product decay fibrin, indicates on spicy inflammatory process

and thrombus formation).

Such changes given rapid test manifest spicy heart attack myocardium, ischemia myocardium, DIC And thrombosis deep veins, A Also allow stratify risks in sharp coronary syndrome.

4. changes coagulograms V first day after injury Not noted even at most heavy patients What speaks O functional solvency liver V the beginning of the disease.

On 2-3 day after receiving injury comes to light increase:

A) Prothrombin time (in some patients up to 130-140 sec (norm: 11-15 sec));

B) INR;

IN) Fibrinogen.

5. Changes in the general analysis of urine were noted already in the process of trauma treatment. And explained reception medicinal drugs, infusion therapy staging urinary catheter And quality personal hygiene patients.

Along With clinical and laboratory violations at 74% affected marked violations on ECG, What appeared V form arrhythmias (tachycardia And extrasystoles), ischemia, violation repolarization, violation conductivity, blockade, hypertrophy.

Changes on Echo-KG hearts represented foci hypokinesis (ischemia cardiac walls).

Cardiologists installed diagnoses: electrical injury hearts, post-burn myocardial dystrophy.

Three patients underwent repeated X-ray computed tomography bones skulls And head brain due to their traumatic damage high voltage electric current.

Revealed:

A). Availability plots hemorrhagic impregnation substances brain With defect coverslips soft fabrics on given level

B). Signs of diffuse edema of the substance of the brain of both hemispheres are expressed - sharp narrowed convexital (convex) subarachnoid space And basal tanks.

How consequence: outflow blood And CSF is

violated. IN dynamics revealed:

1. Extension ventricles;

2. Cluster heterogeneous substances V maxillary sinuses.

X-ray of the chest: in the first days after receiving no changes were registered during the treatment of patients, especially receiving invasive respiratory support (A exactly - IVL), revealed:

A). Strengthening of the vascular pattern of the lungs

(6 people); B). lung infiltration (5 people);

IN). Alveolar pulmonary edema (2

people); G). 10 man without changes.

Perhaps the reason for these changes is the shift in K Na Ca values. As the composition of blood plasma changes, so does the composition of bronchial mucus. What Maybe contribute more lung attachment microorganisms To mucous shell of the respiratory ways.

Featured the following neurological violations:

A) Brief loss of consciousness and convulsions during injury (18 people);

B) retrograde amnesia

(2); IN) Development

encephalopathy (7);

G) Peripheral neuropathy (5).

IN group patients With true electrical injury Can highlight subgroup "visually lungs" affected. Criteria For occurrences V this subgroup become:

A) Square electrical burns 1-5%;

B) Degrees burns: I II, IIIa (surface, heal on one's own).

As a result of the analysis of their cards, 73% of patients from this group have serious clinical and laboratory changes characteristic of electrical injury (at remaining 27% revealed labels current And minor deviations V laboratory indicators).

This result gives grounds to consider each patient with an electrical injury potentially severe, regardless of its condition and the amount of damage on moment hospitalizations.

IN running out electrical injury at researched affected:

1). Formed post-burn scarring, contractures skin covers And joints;

2). Disability affected:

A). 1 adult patient was recognized as a disabled person of the 1st group (amputation of both hands on level forearms);

B). 4 adolescents aged 16-17 years old were exposed to the degree of loss of health of 2-3 degrees, which corresponds to 1-2 group disability;

3). One patient was diagnosed with an extensive defect by neurosurgeons. bones skulls With prolapse substances brain V defect With formation cerebral hernia;

4). Several patients were registered with a cardiologist due to irreversible changes on sides cardiovascular systems.

Conclusions:

1. Electric current, having ability to transform V other kinds energy, has significant damaging action on organism.

2. noted complexity And polysystemic damaging actions.

3. All Patients are potentially heavy.

4. Among the pathological changes in the outcome of electrical injury in the studied material, along with deep burns, a predominance of deviations with aspects of the central nervous system, cardiovascular system and system blood.

5. The peak of changes in the circulatory system falls on 2-3 day (peaks of increased ESR and platelets on days 8-12), cardiovascular - 3-4 day.

6. Damage caused by high voltage current is severe, in almost half of the cases end in death, and the survivors patients often remain disabled people.

Literature

1. Azhibayev K.A. Physiological And pathophysiological mechanisms defeat organism electric current. Ed. "Ilim", Frunze, 1978, 267 p.

2. Ariev T.Ya. burns And frostbite - L., Medicine 1971- 285 With.

3. Fundamentals of the pathology of diseases according to Robbins and Cotran / Kumar V., Abbas A.K., Fausto N., Aster J.K.; per. from English; ed. E. A. Kogan. In

- 3 t. T. 1: chapter 9. - M.: Logosphere, 2014. - 624 p.
4. Pathological physiology. Under ed. N.N. Zaiko And Yu.V. Bytsya. Kyiv, "Logos" 1996 644 With.
 5. Shanin, IN. YU. Clinical pathophysiology / IN. YU. Shanin. SPb., 2005.
 6. Kadirova L. V., Makhmudov Sh. S. PATHOPHYSIOLOGICAL APPROACH TO THE STUDY OF MOUNTAIN SICKNESS // BARKARORLIK VA ETAKCHI TADKIQTOTLAR ONLINE ILMIY JURNALI. - 2022. - Vol. 2. - No. 4. - S. 8-12.
 7. Kadirova L.V. FEATURES OF THE MACROSCOPIC CHARACTERISTICS OF THE ADRENAL GAS OF 3-MONTH-OLD WHITE RATS AFTER SEVERE BRAIN INJURY // Vestnik TMA — 2022.—No. 3,- P.80-82
 8. Kadirova L.V., Nodirdidinov D.M. FEATURES OF PATHOPHYSIOLOGICAL COURSE OF LONG-TERM COMPRESSION SYNDROME //BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI. - 2022. - Vol. 2. - No. 4. - S. 13-17.
 9. Kadirova Laylo Valizhanovna, Temirov, Timur Ikhtiyarovich PATHOPHYSIOLOGICAL APPROACH TO THE STUDY OF ELECTRICAL INJURY // ORIENSS. 2022. No. Special Issue 4-2.
 10. L.V. Kadyrova, G.Sh. Rakhimova "Some Aspects of the State of the Endocrine Glands of White Rats After Traumatic Brain Injury." CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURALSCIENCES. -2021. -FROM. 254-257.
 11. Laylo Valizhanovna Kadirova INTERACTIVE METHOD "BLITZ POLL" IN TEACHING THE SUBJECT PATHOLOGICAL PHYSIOLOGY, ON THE EXAMPLE OF THE TOPIC: "INFLAMMATORY" // Scientific progress. 2022. №2.
 12. Olimova Aziza Zokirovna, (2021, July). COMPARATIVE CHARACTERISTICS OF THE MORPHOLOGICAL PARAMETERS OF THE LIVER AT DIFFERENT PERIODS OF TRAUMATIC BRAIN INJURY. In Euro-Asia Conferences (pp. 139-142).
 13. Olimova Aziza Zokirovna. Частота Встречаемости Миомы Матки У Женщин В Репродуктивном Возрасте. JOURNAL OF ADVANCED RESEARCH AND STABILITY (JARS). Volume: 01 Issue: 06 | 2021. 551-556 p
 14. Olimova Aziza Zokirovna, Sanoyev Bakhtiyor Abdurasulovich. OVARIAN DISEASES IN AGE OF REPRODUCTIVE WOMEN: DERMOID CYST. Volume: 01 Issue: 06 | 2021. 154-161 p
 15. Olimova Aziza Zokirovna. РЕПРОДУКТИВ ЁШДАГИ ЭРКАКЛАРДА БЕПУШТЛИК САБАБЛАРИ: БУХОРО ТУМАНИ ЭПИДЕМИОЛОГИЯСИ. SCIENTIFIC PROGRESS. 2021 й 499-502p
 16. Olimova Aziza Zokirovna .MACRO- AND MICROSCOPIC STRUCTURE OF THE LIVER OF THREE MONTHLY WHITE RATS. ACADEMIC RESEARCH IN EDUCATIONAL SCIENCES /2021 й. 309-312 p
 17. Sanoyev Bakhtiyor Abdurasulovich, Olimova Aziza Zokirovna. Pathology of Precancerous Conditions of the Ovaries in Women of Reproductive Age. Volume: 01 Issue: 06 | 2021.