



FORENSIC ASPECTS OF BURN INJURY ASSESSMENT

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Abstract

A study of living individuals with burn injuries was conducted, 21 of whom were examined in the forensic outpatient department (Group 1), and the remainder in the combustology department (Group 2). It was found that burn injuries primarily occur due to exposure to high temperatures (flames, flammable liquids), and are predominantly male and of working age. To determine the extent of the burn, it is necessary to consider the burn surface area, while also determining the depth of the burn.

Introduction

The causes, pathogenesis, pathomorphism, clinical and morphological features, and epidemiology of thermal trauma, the combined effects of thermal factors and carbon monoxide, and injuries from mechanical impacts from falling parts of burning structures and various objects have been studied in sufficient detail (Khushkadamov Z.K., 2010; Khakimov E.A. et al., 2018) [3,5].

Recently, expert practice has noted an increase in cases of injuries from the ignition of flammable liquids on the human body, but research in this area is virtually nonexistent (Khrustaleva I.E. et al., 2017) [4].

Injuries resulting from thermal trauma and the resulting diagnostic and treatment deficiencies often lead to death or disability (Giyasov Z.A. et al., 2019; Islamov Sh. E., 2018) [1,6].

Due to the significant importance of the problem of death from thermal trauma, there is a need to develop morphological criteria for injury assessment and methods for determining whether the circumstances and conditions of the injury correspond to the results of a forensic examination of a corpse (Khairullaev A.P., et al., 2019) [2,7,8].

It should be noted that thermal trauma requires a special scientific and methodological approach when determining the severity of the harm caused to health, as it is a common type of forensic examination.

The purpose of this study is to identify forensic criteria for burn injury.

Research materials and methods

The study included an analysis of forensic medical examination reports of living individuals and expert opinions, as well as examinations of living individuals. The study included patients undergoing inpatient treatment in the Combustion Department of the Samarkand Regional Branch of the Republican Scientific and Practical Center for Emergency Medicine, with their case histories reviewed.

Of the total number of thermal injuries examined, 60 cases were examined, 21 of which were examined in the forensic outpatient department (Group 1), and the remainder in the Combustion Department (Group 2). Among these, 19 were women and 41 men, aged 6 to 69 years.



Study results

Of all thermal injuries, 32 were flame-related (53.3%) and 13 were flammable liquid ignition-related (25.0%). Electrical burns (6) and contact burns (4) were also identified. In 6 cases, flammable liquid ignition-related injuries occurred at work, in 4 cases (13.95%), in road traffic accidents involving exposure to flammable liquids (gasoline), and in 5 cases, at home. Twelve cases (63.8%) resided in rural areas, while nine (36.2%) resided in urban areas.

In 41 cases (66.5%), a distinctive annular burn pattern was observed on the body, with lobes oriented parallel or perpendicular to the longitudinal axis of the body. The burns often covered an area ranging from 25 to 80% of the body surface.

In a small proportion (3) of inpatient observations, a combination of thermal injury and mechanical damage was noted.

The study revealed that the number of patients with a total burn area was distributed as follows: 20-29% - 10 (16.7%), 30-39% - 8 (13.3%), 40-49% - 11 (18.3%), 50-59% - 13 (21.7%), 60-69% - 9 (15.0%). The area of deep burns was as follows: 10-19% - 12 (20.0%), 20-29% - 10 (16.7%), 30-39% - 16 (26.7%), 40-49% - 9 (15.0%), 50-59% - 8 (13.3%).

Among individuals in Group I, the total burn area was up to 10% in 5 cases (23.8%), and 31-40% in 6 cases (28.6%). It should also be noted that in 5 cases (23.8%), the burn area was not specified in the report.

The distribution of burn severity among Group I patients was as follows: 2 individuals (9.5%) had first-degree burns, 4 individuals (19.0%) had first-degree, third-degree, and third-degree AB burns, and 3 individuals (14.3%) had second-degree and second-degree AB burns.

Analysis of the hospital stay of Group I patients revealed the following: 9 individuals (42.9%) had burns up to 10 days, 5 (23.8%) had burns from 11 to 20 days, 1 (4.8%) had burns from 21 to 30 days, and 2 (9.5%) had burns over 30 days. 4 (19.0%) did not seek medical attention.

Analysis of the burn distribution revealed the following characteristics. Thus, in examined individuals of group I, they are distributed in the following order: head, neck (19.0%), torso, limbs (19.0%), upper limbs (19.0%), lower limbs (14.3%). And in patients of group II, who were in the hospital, they are distributed as follows: torso, limbs (30.8%), head, limbs (28.2%), torso (15.4%), lower limbs (12.8%).

By injury location, Group I individuals were classified as follows: head (15.6%), neck (10.0%), upper limbs – shoulder (11.1%), elbow (14.4%), hand (10.0%), torso – chest (10.0%), abdominal region (5.6%), lower limbs – thigh (10.0%), shin (8.9%), foot (2.2%), and gluteal region (2.2%).

During examination, individuals in Group I denied the presence or development of concomitant pathologies and their complications. In the second group, the following pathologies were identified: general atherosclerosis, coronary cardiosclerosis (15.4%), hypertension (25.6%), coronary heart disease (12.8%), diabetes mellitus (17.9%), chronic bronchitis, pulmonary emphysema, pneumosclerosis (12.8%), pulmonary tuberculosis (2.6%), gastrointestinal diseases (peptic ulcer of the duodenum and stomach, chronic gastritis) (12.8%).

In the early post-traumatic period, postoperative complications included suppuration of the donor site, pneumonia (due to upper respiratory tract burns), autograft lysis, and others. Later complications included pneumonia, sepsis, renal and hepatic failure, disseminated intravascular coagulation (DIC), blood loss due to bleeding from acute gastric ulcers, acute cardiovascular failure, pulmonary and cerebral edema, and others.

When determining the severity of bodily injuries in the examined individuals in Group I, the following was noted: minor bodily injuries without impairment in two individuals (9.5%), minor



injuries with impairment in seven individuals (33.3%), moderate injuries in one (4.8%), and severe injuries in ten (47.6%). In one case (4.8%), the severity was not specified.

Conclusions

Thus, the obtained study data indicate that thermal injury primarily occurs due to exposure to high temperatures (flames, flammable liquids), and is predominantly suffered by men of working age. To determine the extent of the burn, it is necessary to consider the burn surface area (as a percentage of the body surface area); the depth of the burn must also be determined separately.

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