

Advanced Management Of A Burn Patient

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Abstract

Burn injuries represent a primary public health concern with significant global and personal repercussions. These injuries can create complex and potentially life-threatening situations that require advanced care. This review delves into the epidemiology, significance, and state-of-the-art treatments for burn injuries. It covers definitions, risk factors, complications, and various management strategies. The discussion highlights recent advancements in burn care, such as early wound excision, fluid resuscitation, infection control, and rehabilitation support. Emphasis is placed on the evolving research landscape in burn treatment, which aims to improve patient outcomes. The article underscores the importance of a multidisciplinary approach in managing burn patients and the ongoing need for research to enhance the quality of life for burn survivors.

Keywords: *Burn injuries, epidemiology, advanced treatment, adverse effects, burn care.*

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I. Introduction

Burn injuries represent a major worldwide public health issue. Yearly, a vast number of people worldwide have burn injuries; although the vast majority of injuries do not require hospitalization, severe burns can lead to significant morbidity and death. In our country, the rates of burned patients are reported to be up to 13 thousand people, with eight percent being children. Burn injuries have a significant and complex impact. Individuals who have sustained burn injuries may endure intense agony, permanent scars, physical deformities, and, in extreme instances, life-threatening consequences such as infections and the failure of multiple organs. The financial impact of burn injuries is significant, including expenses connected with hospitalization, surgical procedures, and extended rehabilitation. Moreover, burns can have a long-lasting effect on a patient's quality of life, impairing their capacity to work, participate in everyday activities, and sustain social connections[1].

The epidemiology of burn injuries demonstrates their major importance and emphasizes the necessity for sophisticated care approaches. Burn injuries may occur in several contexts, such as homes, workplaces, and industrial locations. They can be caused by various factors, but the most common ones are thermal burns from fires, scalds, and contact with hot surfaces[2].

The epidemiology data highlights the importance of promptly applying sophisticated burn management procedures. Burn injuries impact persons across all age groups, ranging from babies to older people, and can lead to both immediate and enduring physical and psychological repercussions. Knowledge about the epidemiology of burns is essential to develop targeted burn care and preventive methods that meet the individual requirements of afflicted communities[2].

The importance of improved burn care becomes apparent when considering the intricate nature and wide-ranging repercussions of burn injuries. These injuries impact the surface of the skin and extend to the tissues underneath. Furthermore, the extent of burns can vary significantly, ranging from superficial burns with minimal tissue damage to full-thickness burns that affect all layers of the skin[2].

Description of concepts.

Burn injuries are defined by the harm inflicted upon the skin and underlying tissues from different sources, such as heat, electricity, chemicals, or radiation. These injuries are commonly categorized into four degrees:

First-degree burns are superficial burns that specifically impact the outermost layer of the skin, known

as the epidermis. These burns are often distinguished by erythema, discomfort, and slight edema[2].

Second-degree burns, also known as partial-thickness burns, involve damage to the epidermis and the underlying dermis layer. They can induce blisters, intense discomfort, and heightened susceptibility to infection[2].

Third-degree burns refer to burns that cause damage to the epidermis, dermis, and underlying tissues, resulting in full-thickness burns. The burns might manifest as white, black, or charred. Frequently, they lead to numbness as a consequence of nerve impairment[2].

Fourth-degree burns are the most serious, as they harm the skin and extend to the underlying muscles, tendons, and bones. These burns can occur due to extended exposure to intense heat and are frequently life-threatening[2].

When assessing the severity of a burn injury and developing suitable care measures, the depth and breadth of the burn must be taken into account. Furthermore, the patient's age, pre-existing medical problems, and the mode of damage are important aspects that must be considered when evaluating the severity of the burn[2].

Intensive treatment for individuals with burn injuries

It is imperative to offer a step-based guided treatment.

Primary Survey. Provides an immediate evaluation composed by the *ABCDE*. Airway management. Breathing and ventilation. Circulation and cardiac status. Disability, neurologic and gross deformity- Exposure.

Secondary Survey. Consists of a meticulous examination. This is done before addressing the thermal injury. Imaging, laboratory analyses, and adjunctive measures such as urethral catheters, nasogastric tubes, etc., should be completed now.

Balance of Benefits and harms. Assesses the causes of death in the first 24 hours after burn.

Values and preferences. 95% of fatal fire-related burns occur in low—and middle-income countries. And almost a third of those patients don't seek specialized treatment, thus the relevance of planning a protocol in resource-limited settings[3].

Evaluation of Total Body Surface Area (TBSA). This uses a standardized method to predict those with imperative management and for early referral to a specialized treatment center. Standard procedures include the rule of 9's, the Lund-Browder chart, and the palm method. All patients with ten percent or higher percent of TBSA with second or third-degree burns, or in any cosmetic areas, face, hands, feet, genitals, perineum, or across major joints, meet the criteria for referral to a burn center[3].

This evaluation aids for early- tailored-based resuscitation. Burn injuries can lead to substantial fluid loss due to damaged capillaries and heightened permeability of the circulatory system, especially in the first 24 hours. Resuscitation aims to provide adequate perfusion while using the smallest allotment of fluid possible to avoid over-resuscitation and its sequelae. Different formulas for calculating fluid deficit have been proposed: Parkland and the modified Brooke formula. Recommendations for the use of lactated Ringer's solution with all these formulas range from 2 to 4 mL/kg/% burn over 24 hours. All the formulas guide resuscitation with the goal of titrating fluids to obtain a urine output of 0.3–0.5 mL/kg/h in adults and 1.0 mL/kg/h in children. Nevertheless, it has been proposed that properly tailored resuscitation should be based on physiologic needs. Maintenance fluids, including a source of glucose, should be added to pediatric patient resuscitation fluid as hepatic glycogen stores will be depleted after 12–14 h of fasting[4].

Early excision of burn wounds

Performing burn wound excision early is a fundamental aspect of contemporary burn treatment. This method involves surgical extraction of necrotic or injured tissue from the burn area, usually during the first few days after the trauma. The main objective is to facilitate wound healing and minimize the likelihood of infection[5].

Early excision has several benefits:

Preventing Infection: Eliminating dead tissue reduces the likelihood of bacterial colonization, which can result in wound infection. Adopting a proactive strategy is crucial for healing wounds [5].

Accelerated Wound Healing: Early excision of the wound creates a clean area that promotes faster production of granulation tissue and reepithelialization[5].

Pain Management: Early excision of the affected area frequently reduces pain for patients since it eliminates the underlying causes of inflammation and infection[5].

Factors that increase the likelihood of a negative outcome or potential harm.

Age. Children and older patients are particularly vulnerable to burns. Young children are more prone to scalds and contact burns, while older adults may experience burns due to limited mobility or sensory

impairments[6].

Occupation. Specific jobs, such as those involving open flames, hot surfaces, or hazardous chemicals, carry a higher risk of burn injuries. Professions like industrial workers, firefighters, and cooks are especially susceptible[6].

Substance Abuse. The use of alcohol or drugs can impair cognitive functions and physical coordination, leading to accidents that result in burns[6].

Fire Safety Protocols. The absence of proper fire safety measures, such as smoke detectors, fire extinguishers, or fire escape plans in homes and workplaces, increases the likelihood of burn injuries[6].

Understanding these risk factors is crucial for effectively preventing and managing burn injuries in a focused and efficient manner.

Burn injuries can give rise to many problems, both acute and chronic, that can have a substantial influence on the patient's health and quality of life. Frequent problems include:

Infection: Open burn wounds are more vulnerable to disease as a result of the absence of the skin's protective layer. Ensuring the prevention and treatment of infections is of utmost importance in burn therapy. Ensuring infection prevention and effective management is a crucial component of providing care for burn patients. Burn injuries create open sores that are highly susceptible to bacterial colonization. Infection may result in the delayed healing of wounds, sepsis, and other potentially fatal problems.

Advanced infection control strategies encompass the utilization of antimicrobial dressings, topical medicines, and prompt removal of contaminated tissue. In addition, it is crucial to monitor closely to rapidly identify and treat infections[7].

II. Discussion

Advanced burn care is a multidisciplinary teamwork that integrates medical, surgical, and physical and psychological therapies. Improving outcomes and improving the quality of life for burn survivors is crucial. The future of burn treatment shows potential for enhancing the well-being of those impacted by burn injuries via continuous research and therapeutic breakthroughs.

Ultimately, comprehensive burn care encompasses both scientific principles and artistic techniques. Optimal treatment and assistance for burn sufferers necessitates the collaboration of a committed and proficient healthcare staff, consequently enhancing their prospects of recuperation and an improved quality of life.