



Research Article

One year prevalence of critically ill burn wound bacterial infections in surgical ICU in Egypt: Retrospective study



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KEYWORDS

Critically ill burn;
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Abstract *Introduction:* Burns are one of the most common and devastating forms of trauma. Patients with serious thermal injury require immediate specialized care in order to minimize morbidity and mortality. (1) The main purpose of this study was to determine the prevalence of bacterial wound infection in critically ill burn patients in surgical intensive care unit in Egypt.

Objectives: The aim of this study was to determine the bacterial isolates in sever burn wound infection, suitability to antibiotics and there are mortalities.

Methods: We conducted a one year retrospective study in the surgical ICU. Wound swab Culture and sensitivity reports of admitted patients. All the patients of all age groups suffering with flame burnt and both sexes having complete Culture and sensitivity reports were included.

Results: The main finding of the current study described herein was the percent of isolates from burn wound (60%). The most common organism was pseudomonas (49%). Multidrug resistant gram negative organisms represent about 60% of the isolates. Pattern of antibiotic sensitivity was 84% for colistin, 39% for amikacin and 35% for imipenem. The mortalities in our study were 80%.

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1. Introduction

Burns are one of the most common and devastating forms of trauma. Patients with serious thermal injury require immediate specialized care in order to minimize morbidity and mortality [1]. It has been estimated that 75% of all deaths following

thermal injuries are related to infection [2]. Burn patients are at a high risk for infection as a result of the nature of the burn injury itself, the immune compromise effects of burns, prolonged hospital stays, intensive diagnostic and therapeutic procedures. In addition, control and prevention of infectious diseases among burned patients present a greater and more specialized problem due to disrupting the skin barrier and the environment in Burn Units that might be contaminated with resistant organisms. These organisms can easily transmit from one patient to another. Those burn care units can be the site of explosion and prolonged outbreaks caused by resistant organisms [3,4].

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Burn wound surfaces are sterile immediately following thermal injury, and these wounds eventually become colonized with microorganisms [5], gram positive bacteria that survive the thermal insult, such as *Staphylococcus aureus* located deep within sweat glands and hair follicles, heavily colonizing the burn wound surface within first 48 h [5]. Topical antimicrobials decrease microbial overgrowth but seldom prevent further colonization with other potentially invasive bacteria and fungi. Gastrointestinal and upper respiratory tract and the hospital environment [6]. Following colonization, these organisms start penetrating the viable tissue depending on their invasive capacity, local wound factors and the degree of the patients' immunosuppression [7]. If sub-eschar tissue is invaded, disseminated infection is likely to occur, and the causative infective microorganisms in any burn facility changes with time [8]. The pattern of antimicrobial susceptibility of *S. aureus* and other organisms has changed worldwide, especially in developing countries that antimicrobial agents have become increasingly less effective [9]. We will propagate retrospective observational study to assess the prevalence of bacterial wound infections in critically ill burn patients and their outcome.

2. Patient and methods

This study was performed in a surgical ICU at Cairo University in Egypt retrospectively conducted on wound swab Culture and sensitivity reports of admitted patient.

All the patients suffering with severe flame burnt of all age groups and both sexes having complete Culture and sensitivity reports were included.

Patients were resuscitated using the modified Parkland formula [10]. Enteral nutrition was started within the 24 h of injury and gradually increased during the first 3 days.

Excision of the burn wound will begin after the first 2 days. Burn wounds were treated daily with closed dressings after application of silver sulfadiazine.

Wound swaps were obtained twice weekly to monitor colonization and when infection was suspected samples were cultured on thioglycollate medium and blood agar in Department of Microbiology laboratory.

Prophylactic antibiotics were given 30 min before debridement. Adding or changing antibiotics was based on culture and sensitivity.

The isolation practices implemented in the ICU included hand decontamination before each patient contact, washing hands and changing gloves between sequences of care, and wearing gloves in case of contact with burn wound body substance [11].

3. Results

Among 35 burn patients enrolled in our study, female patients were 16 (46%) and male patients were 19 (54%). 11 (31%) patients lied in age group (21–30); mean age was 24 ± 18 and median age was 22 years. 21(60%) patients were TBA more than 50% mean burn area 58.6 ± 20 and median of burn area was 60 Table 1.

Growth of burn wound bacterial organisms and culture sensitivity pattern were recorded. The most common organism

Table 1 Demographic data characteristics and percent of burn surface area.

	N	%
Age		
0–10	10	28
11–20	6	17
21–30	11	31
31–40	3	8
41–50	3	8
51+	3	8
Sex		
Male	19	54
Female	16	46
Burn area		
30–50%	14	40
> 50%	21	60

was pseudomonas (49%) followed by *S. aureus* (21%) and *Klebsiella* (15%) Fig. 1.

Multidrug resistant gram negative organisms represent about 60% of the isolate Fig. 2.

Pattern of antibiotic sensitivity was 84% for colistin, 39% for amikacin and 35% for imipenem Fig. 3.

The mortalities in our study were 80% while 20% of patients survived and were discharged from the ICU Fig. 4.

78% of mortalities were due to septic shock while 15% died from sepsis induced ARDS and 7% of mortalities were caused by cardiogenic shock Fig. 5.

4. Discussion

Burns are one of the most common and devastating forms of trauma. Patients with serious thermal injury require immediate specialized care in order to minimize morbidity and mortality [1]. Burn wound if not excised and grafted early becomes an ideal culture medium for the growth of microorganisms [12]. Infection is an important cause of morbidity and mortality in burns. Severe burn patients are very susceptible to infection because of wide exposed raw areas, the presence of necrotic tissue, protein rich exudates, inability of blood to reach the colonized areas of wounds and other host defense mechanisms [13]. Also mattresses, bed sheets, dressing materials, and other

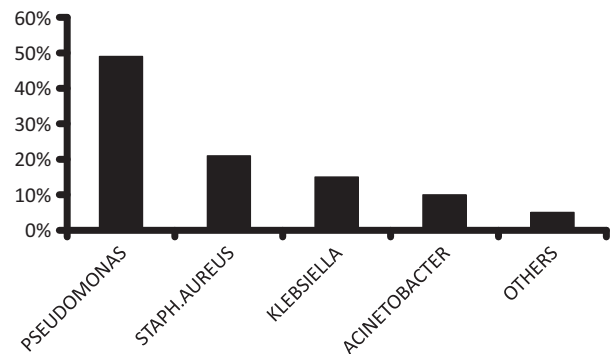


Figure 1 Percentage of each isolate to the total wound isolates.

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