Original Article:

Skin Diseases in Critically Ill Patients: An Overview

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Abstract

Background: In the intensive care unit (ICU) patients, skin diseases manifest themselves differently due to comorbid diseases and ongoing a number of medications. **Objectives:** To evaluate the spectrum of skin conditions in intensive care unit (ICU) patients. **Methods:** This was a retrospective study of 644 patients aged 18 and above who were admitted to the ICU & HDU for different health issues. Skin conditions were evaluated and categorized by a qualified dermatologist. **Results: T**he total number of patients was 644 in the ICU & HDU over a period of 10 months. Fifty-seven patients with dermatologic problems were identified among them 30 were female and 27 were males. The age ranged from 18 to 98 years of life (mean ± standard deviation: 43.6±30.1 years). The most common skin disorders were infectious diseases (35%), followed by inflammatory and autoimmune disease (24.56%) and vascular and coagulopathy (17.5%), drug eruption (12.2%)and miscellaneous (7%)and dermatosis due to exogenous factor (3.5%).
Conclusion: Skin infections, inflammatory and autoimmune diseases, coagulopathy and drug reactions were found to be more prevalent in ICU patients. Early diagnosis and treatment can improve the quality of patient's life in ICU.

Keywords: Intensive care unit, Skin diseases, critically ill patients.

Introduction

Intensive care units (ICU) represent a proportion of patients with most complex medical issues. Less than 0.5% of patients require admission to an intensive care unit (ICU) for skin diseases.[1] Skin manifestations in critical patients are relatively frequent and can be markers of extra cutaneous pathology. About 10.4%-42.2% of patients admitted to an ICU had some type of skin diseases[2,3]. Identifying these manifestations could be a key for the diagnosis of an underlying disease. Examples include skin manifestations in meningococcal sepsis, skin as an expression of disseminated candidiasis, or ecthyma gangrenosum in Pseudomonasaeruginosa infection.[4,5] Skin diseases can manifest as secondary effects of drugs or devices, procedures, or simply a patient's critical situation [6-10].

Skin diseases itself may lead to ICU admission in case of emergencies like severe adverse drug reactions including Stevens-Johnson syndrome, drug reactions with eosinophilia and systemic symptoms (DRESS), toxic epidermal necrosis, serum sickness-like syndrome[11-14].

In the ICU, patients may be at risk of secondary skin infections from nosocomial organisms, as they spend an extended time in bed, connected to life-support machines.[15,16] A prior study indicated that fungal infections accounted for 59% of overall dermatological infections in the ICU.[2] Furthermore, pressure ulcers are more prevalent in the ICU, particularly among elderly, chronically bedridden, and malnourished patients.[17,18] Data revealed that 42.2% of severely ill patients exhibited dermatological manifestations requiring medical attention[2]. Early recognition of dermatological manifestations is crucial, and consultation with dermatologists is recommended due to the complexity of certain critical skin conditions[16].

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Materials and Methods

All adult patients admitted to the ICU of a tertiary care hospital between January to October 2025 were evaluated for skin diseases. The study protocol was approved by the IRB,

Statistical analysis. Data analysis was carried out by using the Statistical Package for the Social Sciences, version 22. Categorical variables were described using frequency and percent distribution. Dermatological diagnoses, disease categories, and related subcategories were tabulated and presented graphically. The mean age of patients was calculated with standard deviation.

Results. The total number of patients evaluated was 644. Out of which, 57 (8.85%) patients had skin manifestations. Age ranged from 18-98 years (43.6±30.1 years). Males comprised 27 (47.36%) of the patients.

The most commonly reported dermatological disorders were morbilliform drug eruption, followed by contact dermatitis, vasculitis, and herpes zoster (Figure 1). Infections, inflammatory and autoimmune diseases, and coagulopathy, drug reactions were the most prevalent general categories of skin diseases (Table 1).Table 2 outlines the details of all dermatologic conditions documented in this study. Eczema, pyoderma gangrenosum, psoriasis were the similar predominance inflammatory disease while bullous pemphigoid was the common immunobullous condition in this study

Among infectious cases, bacterial infections were the most common, accounting for 60% of the cases. Among Vascular and coagulopathies cases purpura is commonest and others are purpura fulminans(fig 2)

On the other hand, among adults and elderly patients, the most prevalent diagnoses were morbilliform drug eruption, purpura, vasculitis, and herpes zoster (Figure 1).

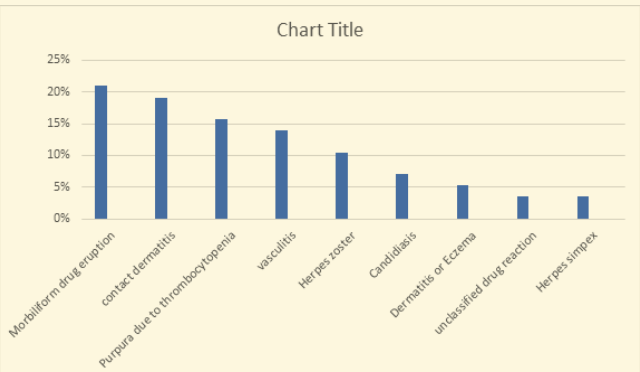

Figure 1: Skin diseases among intensive care unit patients

Table 1 - Categories of dermatological conditions among intensive care unit patients (N=57).

Categories	n (%)
Infections	20 (35%)
diseases	14(24.56)
Vascular and coagulopathies	10(17.5%)
Drug reactions	7 (12.28%)
factors	2 (3.5%)
Miscellaneous	4(7%)

Vlaues are presented as numbers and percentages (%).

Table 2 - All dermatological conditions among intensive care unit patients (N=57).

Categories	n (%)	%all dermatological conditions
Infections		
Bacterial		
Cellulitis	5	8.77%
Ecthyma or ecthyma gangrenosum	2	3.5%
Bullous impetigo	1	1.75%
Skin abscesses(melioidosis)	1	1.75%
Staphylococcal scalded skin syndrome	1	1.75%
Necrotizing fasciitis	1	1.75%
Toxic shock syndrome	1	
Sepsis(Septic arthritis)		1.75%
Fungal		
Candidiasis	3	5.25%
Unclassified fungal infection	2	3.5%
Viral		
Herpes zoster	1	1.75%
Herpes simplex virus	1	1.75%
Viral exanthem	1	1.75%
Inflammatory and autoimmune diseases		
Dermatitis or eczema	2	3.5%
Erythema multiforme	1	1.75%
Pyoderma gangrenosum	2	3.5%
Erythroderma	1	1.75%
Psoriasis	2	3.5%
Connective tissue diseases		
Lupus erythematosus	1	1.75%
Mixed connective tissue disease	2	3.5%
Immunobullous		
Bullous pemphigoid	2	3.5%
Epidermolysis bullosa acquisita	1	1.75%
Drug reactions		
Severe cutaneous drug adverse reactions	1	1.75%
SJS/TEN	1	1.75%
DRESS syndrome		
Other drug reactions		
Morbilliform drug eruption	2	3.5%
Bullous drug eruption	1	1.75%
Fixed drug eruption	1	1.75%
Unclassified drug reaction	1	1.75%

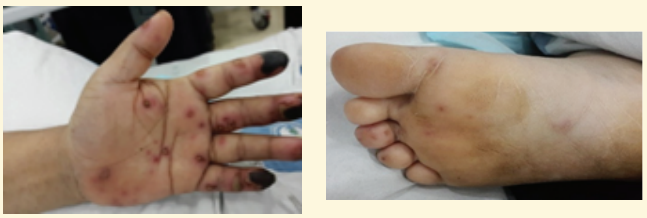

Figure 2: Septic emboli from septic arthritis

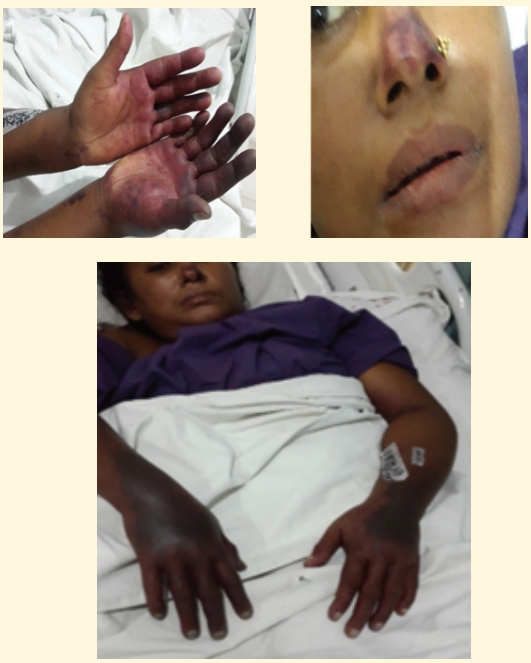

Figure 3: Purpura Fulminans

Discussion

In this study, 8.89% of ICU admitted patient had skin manifestations. Infectious diseases were the most prevalent, accounting for 35% of the cases, which is consistent with findings from a previous report.19 Among infectious conditions, bacterial infection was 60%, with cellulitis representing the majority (41%) of bacterial infections. Fungal and viral infections were less frequent causes of skin infections. It is important to mention that the prevalence of different organisms causing ICU-related skin infections can vary in the literature. For example, a recent study indicated that fungal infections were the most common among ICU patients, followed by viral infections.20 Conversely, another study reported that bacterial infections, particularly Staphylococcus aureus, was the primary pathogens, followed by fungal infections.21 It is likely that the higher infection rates observed in ICU patients can be attributed to their extended hospital stays, severe medical conditions, and immunosuppressive treatments.22 Furthermore, another study demonstrated a correlation between infectious dermatological conditions and longer hospital stays.1

Adverse drug reactions (ADRs) were fourth general categories of skin diseases in this study. The unique characteristics of ICU patients, such as their underlying illnesses, complex medication regimens, and co-existing multi-organ failure, can affect the pharmacokinetics of drugs and increase the risk of developing ADRs.23 A previous study reported a prevalence of 11.6% for ADRs among ICU patients, which aligns with our findings.24 In this study, we observed that morbilliform drug eruption (3.5%) was the most frequently diagnosed ADR among all ICU patients. This contrasts with a previous study where ADRs accounted for only 3.7% of cases.25 Among ADRs, antimicrobials were the primary culprits, followed by nonsteroidal anti-inflammatory drugs (NSAIDs), according to previous study.24Stevens-Johnson syndrome/toxic epidermal necrolysis are severe, life-threatening skin conditions that necessitate ICU admission as primary skin disorders.25

Inflammatory and autoimmune diseases were very common in this study. Dermatitis or eczema and psoriasis were the common diagnosis in this category. Similarly, contact dermatitis ranked as the second most reported diagnosis among all ICU patients (3.5%). In line with our findings, a retrospective study analyzing dermatological consultation requests in inpatient settings identified contact dermatitis as the most frequent diagnosis (8.9%).26The study also revealed that devices, wound dressings, and antiseptics were common causes of contact dermatitis, particularly in patients with sensitive skin.19After contact dermatitis, bed sores were the second most common diagnosis within dermatoses due to exogenous factors. Another local study reported a hospital-acquired pressure ulcer incidence of 39.3% among ICU patients.27 A systematic review emphasized several risk factors associated with the development of pressure sores in ICU patients, including advanced age, prolonged hypotension, mechanical ventilation, hemodialysis, vasopressor support, sedation, and postural changes.28 Vascular diseases and coagulopathies represented 17.57% of dermatoses among ICU patients. Purpura due to thrombocytopenia (30%) was the most common diagnoses within this category. In contrast, a similar study identified purpura as the most frequent non-infectious cause, with trauma being the most commonly reported cause, followed by vasculitis and purpura.20

Study limitations: The retrospective nature of the study and the use of medical records might have affected the accuracy of the results. Further concerns arise from the fact that the study was carried out in only one center which raises questions regarding its generalizability.

Conclusion

Skin diseases are frequently observed among patients in the ICU, and they can vary widely in terms of severity. Among the various categories, skin infections, inflammatory and autoimmune diseases, and drug reactions are commonly encountered. Proper diagnosis and management of skin disease is crucial in providing optimal care and improving outcomes for ICU patients.

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