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Original Article

Is Restrictive Transfusion in the Burn Intensive Care Unit a Dream?

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ABSTRACT

Objective: In patients admitted to burn intensive care units (ICUs), increase the need for blood transfusions. In parallel with prolonged ICU stays, the risk of bloodstream infections (BSIs) also increases. This study aims to examine the relationship between transfusion and BSIs and to promote the practice of restrictive transfusion.

Methods: 158 patients with severe burns (≥20% total body surface area) were treated in the burn ICU of our hospital over five years. The hemoglobin (Hb) threshold for restrictive transfusion was defined as 7 g/dL, while for liberal transfusion it was set at 10 g/dL.

Results: Of the 158 patients included in the study, 17.7% (n=28) were female. The mean age of the patients was 41±15 years. The average total body surface area (TBSA) burned was 42.7±17% (range: 20–92%). The causes of burns were flame in 79.2% (n=125), electricity in 10.1% (n=16), boiling water in 7% (n=11), hot oil and steam in one patient each (0.6%), and chemicals in 2.5% (n=4). A statistically significant relationship was found between the total number of transfusions and burn percentage, length of stay in the burn ICU, number of escharotomy procedures performed, final hemoglobin (Hb), white blood cell (WBC) count, and number of fresh frozen plasma (FFP) units ($p<0.05$). Restrictive transfusion was adopted in 72.5–86.8% of erythrocyte suspension (ES) transfusions. Among the BSIs, the most commonly isolated pathogens were coagulase-negative staphylococci (CNS) in 28.5% (n=45), A. baumannii in 19.6% (n=31), and P. aeruginosa in 12.7% (n=20). A statistically significant association was found between the number of transfusions and the presence of CNS and P. aeruginosa isolates ($p<0.05$), whereas no such association was found with A. baumannii ($p>0.05$). The rate of BSIs caused by Candida species was 4.5% (n=7).

Conclusion: Were commend a restrictive transfusion strategy in burn ICU patientsto minimize transfusion-related reactions and BSI risk while ensuring optimal patient support.

INTRODUCTION

Blood component transfusion is an indispensable part of the treatment of patients admitted to intensive care units (ICUs). Advanced age, chronic diseases, surgical interventions, gastrointestinal bleeding, prolonged ICU stays resulting in malnutrition, frequent blood draws for routine laboratory testing, and major tissue trauma—as in the case of burns—and the associated numerous surgical procedures are among the leading causes of blood transfusions.[1-3]

Although the primary objective is to replace erythrocytes and platelets and to correct coagulopathy, transfusions can lead to a wide range of complications, including acute hemolytic transfusion reactions, allergic and anaphylactic reactions, febrile non-hemolytic transfusion reactions, transfusion-associated circulatory overload, transfusion-related acute lung injury, graft-versus-host disease, and transfusion-transmitted infections.[3,4] As the surface area and depth of burns increase, patients' ICU stays are prolonged, resulting in additional transfusion requirements and increased BSI incidence. The World Health Organization (WHO) recommends safe and rational use of blood to reduce unnecessary and unsafe transfusions, improve patient outcomes and safety, and thereby minimize the risk of adverse events such as errors, transfusion reactions, and transmission of infections.[5]

Numerous studies have compared restrictive (maintaining Hb above 7 g/dL) and liberal (maintaining Hb above 10 g/dL) transfusion strategies in ICUs, and they generally support restrictive transfusion.[6,7] However, specific standards must be established for the implementation of these approaches in burn ICUs.

In ICU patients, the risk of anemia—alongside the increase in surgical interventions and radical dressing procedures proportional to burn area—heightens the need for erythrocyte suspension (ES) transfusions.[3] An experienced surgeon and intensive care specialist can predict, in advance of a specific surgical procedure, how many units of blood a patient may lose and the transfusion requirement. Given the lack of a well-established blood donation culture in society, difficulties in blood supply, material costs, and transfusion-related complications, there is a need to establish standards for restrictive transfusion practices.

In our study, we aimed to promote restrictive transfusion in burn ICUs, not only to reduce various transfusion-related complications and improve cost-effectiveness, but also to decrease or prevent bloodstream infections (BSIs).

MATERIALS AND METHODS

The study was approved by the Kartal Dr. Lütfi Kırdar City Hospital Ethics Committee (Date: 24/01/2025, No: 2025/010.99/12/23) and was conducted in accordance with the principles of the Declaration of Helsinki.

Between January 1, 2020, and December 31, 2024, a total of 482 patients admitted and followed in the burn ICU of our hospital were identified via the hospital automation system. Seventy-four pediatric patients under 18 years of age were excluded from the study, and the remaining 408 adult patients were screened. Of these, 158 patients with a burn surface area of ≥20% were included in the study.

Demographic data, comorbidities, Glasgow Coma Scale (GCS) and APACHE II scores calculated on the day of admission, causes and percentages of burns, burn depths, length of stay in the burn ICU, number of escharotomies, blood types, initial and final hemoglobin (Hb) levels measured after ICU admission, number of transfused erythrocyte suspensions (ES), fresh frozen plasma (FFP), apheresis platelet suspensions (PS), pooled PS, and cryoprecipitate units were recorded in an Excel spreadsheet. Patients were divided into three groups based on their Hb levels: <7 g/dL, 7–10 g/dL, and>10 g/dL to evaluate the efficacy of restrictive (Hb<7 g/dL) and liberal (Hb>10 g/dL) ES transfusion strategies in the burn ICU, pre- and post-transfusion Hb levels were recorded for each group.

Microorganisms isolated from patients who received ES transfusions and were diagnosed with BSI were also recorded in the Excel spreadsheet. Only the first positive culture was included in the analysis of cases which the same microorganism was isolated multiple times from the same patient. The relationship between the number of ES transfusions and the incidence of BSI was examined.

Statistical Analysis

Patient data collected for the study were analyzed using the IBM Statistical Package for the Social Sciences (SPSS) for macOS version 30.0 (IBM Corp., Armonk, NY). Frequencies and percentages were used for categorical variables, and mean, standard deviation, median, minimum, and maximum values were used for continuous variables. The Kolmogorov–Smirnov test was used to assess the normality of variable distribution. For comparisons between groups, the Mann–Whitney U test was used for two groups, the Kruskal–Wallis H test for more than two groups, and the chi-square test was used for categorical variables. Spearman's correlation analysis was used to examine relationships between continuous variables. A p-value <0.05 was considered statistically significant.

RESULTS

Of the 158 patients included in the study, 17.7% (n=28) were female and 82.3% (n=130) were male. The mean age of the patients was 41±15 years. The distribution of demographic and clinical characteristics is presented in Table 1. Upon admission to the burn ICU, the mean Glasgow Coma Scale score was 10.5±5, and the mean APACHE II score was 27.8±9.9. Comorbidities included hypertension (HT) in 21 patients (13.3%), diabetes mellitus (DM) in 10 patients (6.3%), and coronary artery disease (CAD) in 6 patients (3.8%) (Table 1).

The mean burn percentage was 42.7±17% (range: 20–92%). The most common cause was flame burns in 79.2% (n=125) of patients. Among these, 11 patients (8.8%) also had inhalation injury. Burn etiologies included electrical burns in 10.1% (n=16), scalds from boiling water in 7% (n=11), hot oil and steam burns in one patient each (0.6%), and chemical burns in 2.5% (n=4). The chemical burn agents were hydrogen peroxide, tar, soda-cyanide, and thinner. Partial-thickness burns were present in 11.4% (n=18), mixed-depth (partial/full-thickness) burns in 69% (n=109), and full-thickness burns in 19.6% (n=31). The average length of stay in the burn ICU was 26.7±19.8 days. On average, each patient underwent 4.2±3.2 escharotomy procedures (Table 1).

The relationship between the total number of ES transfusions administered to burn patients and their demographic and clinical findings is shown in Table 2. If a statistically significant relationship was found between the variables, the direction of the correlation was assessed using the correlation coefficient (r). A positive correlation coefficient indicated a direct relationship between the variables, whereas a negative coefficient indicated an inverse relationship. The interpretation of correlation strength was as follows:

- 0.00–0.29: weak correlation
- 0.30–0.49: low correlation
- 0.50–0.69: moderate correlation

Table 1. Distribution of demographic and clinical findings of patients

Variables (N=158)	n (%)	Average±SS	Median (Min-Max)
Age	41±15	40 (18-85)	
Gender			
Female	28 (17.7)		
Male	130 (82.3)		
Glascow comascale (hospitalization day)		10.5±5	14.5 (3-18)
APACHI II score (hospitalization day)		27.8±9.9	30 (1-55)
Diabetesmellitus	10 (6.3)		
Hypertension	21 (13.3)		
Hypothyroidism	3 (1.9)		
Mentalretardation	2 (1.3)		
Schizophrenia	6 (3.8)		
Substance addiction	3 (1.9)		
Alcohol addiction	2 (1.3)		
Coronary artery disease	6 (3.8)		
Congestive heart failure	1 (0.6)		
Chronic obstructive pulmonary disease	1 (0.6)		
Depression	1 (0.6)		
Cerebrovascular disease	3 (1.9)		
Atrial fibrillation	2 (1.3)		
Alzheimer's disease	1 (0.6)		
Bronchial asthma	1 (0.6)		
Obesity	2 (1.3)		
Prostate cancer	1 (0.6)		
Malignant melanoma	1 (0.6)		
Mood disorder	1 (0.6)		
Vertigo	2 (1.3)		
Cause of burn			
Flame	125 (79.1)		
Electric	16 (10.1)		
Scalds	11 (7)		
Hot oil	1 (0.6)		
Hot steam	1 (0.6)		
Chemical	4 (2.5)		
Inhalation injury	11 (8.8)		
Burn (%)		42.7±17	40 (20-92)
Burn depth			
Partial thickness	18 (11.4)		
Partial thickness/ Full thickness burn	109 (69)		
Full thickness burn	31 (19.6)		
Length of stay in ICU (days)		26.7±19.8	23.5 (1-156)
Escharotomy surgery		4.2±3.2	3 (1-21)
Hb on ICU admission(mg/dl)		15.3±3.1	15.6 (4.6-24.3)
HCT on ICU admission(%)		46.1±9.1	47.1 (15.2-72.6)
PLT on ICU admission(x103/µL)		279.7±116.4	270 (73-931)
WBC on ICU admission(µL)		22016.3±11257.7	19695 (2460-62960)
Hb at discharge from ICU (mg/dl)		9.1±1.4	9 (3.9-15)
HCT at discharge from ICU (%)		27.8±4.3	27.8 (11.8-45.4)
PLT at dischargefrom ICU (x103/µL)		283.5±207.4	272 (7-1080)
WBC at dischargefrom ICU (µL)		12493±10004.9	10180 (440-68410)
Blood groups			
A Rh (-)	8 (5.1)		

A Rh (+)	61 (38.6)		
AB Rh (-)	1 (0.6)		
AB Rh (+)	13 (8.2)		
B Rh (-)	3 (1.9)		
B Rh (+)	19 (12)		
O Rh (-)	3 (1.9)		
O Rh (+)	50 (31.6)		
ES transfusion		14.7±12.7	12 (1-68)
FFP transfusion		9.7±9.9	7 (1-55)
Apheresis TS transfusion		3.1±4.5	1 (1-16)
Pooled TS transfusion		3.4±3	2 (1-13)
Kryoprespitate transfusion		3.3±3	2.5 (1-9)
Bloodstreaminfectionisolates			
Acinetobacter baumannii	31 (19.6)		
Aeromonas punctata (caviae)	1 (0.6)		
Bacillus cereus group	2 (1.3)		
Candida albicans	2 (1.3)		
Candida parapsilosis	5 (3.2)		
Corynebacterium Species	4 (2.5)		
Difteroid basil	1 (0.6)		
Enterobacter aerogenes	2 (1.3)		
Enterobacter cloacae	2 (1.3)		
Enterococcus faecalis	7 (4.4)		
Enterococcus faecium	1 (0.6)		
Enterococcus gallinarum	1 (0.6)		
Escherichia coli	3 (1.9)		
Klebsiella oxytoca	1 (0.6)		
Klebsiella pneumoniae	5 (3.2)		
CNS	45 (28.5)		
Microbacterium flavescens/laevaniformans	1 (0.6)		
Pantoea dispersa	1 (0.6)		
Propionibacterium acnes	1 (0.6)		
Proteus mirabilis	2 (1.3)		
Providencia rettgeri	1 (0.6)		
Pseudomonas aeruginosa	20 (12.7)		
Pseudomonas putida	1 (0.6)		
Serratia marcescens	4 (2.5)		
Sphingomonas paucimobilis	2 (1.3)		
Staphylococcus aureus	2 (1.3)		
Stenotrophomonas maltophilia	3(1.9)		
Turicellaotitidis	1 (0.6)		

APACHE: Acute Physiology and Chronic Health Evaluation; Hb: Hemoglobin; HCT: Hematocrit; PLT: Platelet; WBC: White Blood Cell; ES: Erythrocyte suspension; FFP: Fresh frozen plasma; TS: Thrombocyte suspension; ICU: Intensive Care Unit; CNS: Coagulase negative Staphylococci.

- 0.70–0.89: strong correlation
- 0.90–1.00: very strong correlation

Upon examination of the table, statistically significant correlations ($p<0.05$) were identified between the total number of transfusions and the following variables: Burn percentage (weak, positive correlation), length of stay in the burn ICU (strong, positive correlation), number of escharotomy procedures (moderate, positive correlation), discharge hemoglobin (Hb) and white blood cell (WBC) counts (weak, negative correlations), and number of FFP units transfused (strong, positive correlation).

Regarding blood types, 38.7% (n=61) of patients had A RhD (+), and 31.7% (n=50) had O RhD (+). A mean of 14.7±12.7 units of erythrocyte suspension (ES) was transfused per patient (Table 1). The distribution of pre- and post-transfusion Hb levels among burn patients is shown in Table 3. A total of 1242 ES transfusions were administered. There was a statistically significant difference

Table 2. Investigation of the relationship between patients' transfusion numbers and demographic and clinical characteristics

	Number of ES
Age	
r	-0.072
p	0.366
Glascow coma scale	
r	-0.014
p	0.861
APACHE II Score	
r	-0.019
p	0.810
Burn (%)	
r	0.160
p	0.045
Length of stay in burn ICU	
r	0.757
p	<0.001
Escharotomy surgery	
r	0.684
p	<0.001
Hb on ICU admission (mg/dl)	
r	0.100
p	0.212
HCT on ICU admission (mg/dl)	
r	0.127
p	0.112
PLT on ICU admission (mg/dl)	
r	0.059
p	0.461
WBC on ICU admission (mg/dl)	
r	0.038
p	0.639
Hb at discharge from ICU (mg/dl)	
r	-0.187
p	0.019
HCT at discharge from ICU (mg/dl)	
r	-0.177
p	0.027
PLT at discharge from ICU (mg/dl)	
r	-0.098
p	0.222
WBC at discharge from ICU (mg/dl)	
r	-0.214
p	0.007
FFP	
r	0.808
p	<0.001

APACHE: Acute Physiology and Chronic Health Evaluation; Hb: Hemoglobin; HCT: Hematocrit; PLT: Platelet; WBC: White Blood Cell; ES: Erythrocyte suspension; FFP: Fresh frozen plasma; ICU: Intensive Care Unit.

Table 3. Distribution of hemoglobin measurements of patients before and after transfusion

	Post-transfusion hemoglobin		
	<7	7-10	>10
Pre-transfusion hemoglobin			
<7	2 (2.9)	50 (72.5)	17 (24.6)
7-10	43 (4.3)	822 (82.3)	134 (13.4)
>10	6 (3.4)	151 (86.8)	17 (9.8)

* p=0.042

Table 4. Distribution of transfusion numbers according to demographic and clinical characteristics of patients

Variables	Number of ES	
	Median (Min-Max)	p-value
Gender		0.814
Female	11.5 (1-47)	
Male	12 (1-68)	
Hypertension		0.124
No	12 (1-47)	
Yes	14 (1-68)	
Burn depth		0.400
Partial thickness/ Full thickness burn	13 (1-56)	
Partial thickness	11.5 (1-30)	
Full thickness burn	8 (1-68)	
CNS		0.003
No	10 (1-68)	
Yes	15 (3-47)	
Pseudomonas aeruginosa		0.003
No	10 (1-68)	
Yes	17.5 (1-47)	
Acinetobacter baumannii		0.069
No	10 (1-68)	
Yes	15 (2-45)	

CNS: Coagulase negative Staphylococci.

between pre- and post-transfusion Hb values (p<0.05). Among patients with pre-transfusion Hb<7 mg/dL, 72.5% (n=50) had post-transfusion Hb levels of 7–10 mg/dL, and 24.6% (n=17) had levels >10 mg/dL. Of those with pre-transfusion Hb>10 mg/dL, 86.8% (n=151) had post-transfusion Hb between 7–10 mg/dL, while 3.4% (n=6) had levels <7 mg/dL. Among patients whose pre-transfusion Hb levels were between 7–10 mg/dL, 82.3% (n=822) remained within the same range post-transfusion (Table 3).

The most frequently isolated microorganism from the blood cultures of patients who received ES transfusions was coagulase-negative staphylococci (CNS), identified in

28.5% (n=45) of patients. This was followed by *Acinetobacter baumannii* in 19.6% (n=31) and *Pseudomonas aeruginosa* in 12.7% (n=20) (Table 1). The distribution of transfusion counts according to patients' demographic and clinical characteristics is presented in Table 4. A statistically significant difference was found between the number of transfusions and BSIs caused by CNS and *P. aeruginosa* ($p<0.05$). As the number of ES transfusions increased, the incidence of BSIs caused by these microorganisms also rose. However, there was no statistically significant relationship between the number of ES transfusions and BSIs due to *A. baumannii* ($p>0.05$). The isolation rate of *Candida species* was 4.5% (n=7), five of which were *C. parapsilosis*. Multiple microorganisms were isolated from the blood cultures of some patients.

DISCUSSION

Burn injuries predominantly result from occupational exposure, particularly in high-risk and hazardous work environments, which explains the male predominance (82.3%) observed in our study. Flame burns, electrical injuries, and chemical burns accounted for 91.8% of all burn cases (Table 1), with flame burns being the most frequent etiology (79.1%, n=125). Although workplace accidents were the primary source, some incidents also stemmed from residential fires. Similarly, Abda et al.[8] reported a male predominance (76.1%) among burn patients, with flame exposure as the most common cause (63%). In our cohort, 8.8% (n=11) of patients with flame burns also had inhalation injuries, and these patients exhibited larger total body surface area (TBSA) burns. Inhalation injury typically affects the upper airway and may lead to acute respiratory arrest due to edema, which can manifest early or evolve within hours and may take up to six days to resolve.[9] Electrical and chemical burns were exclusively occupational in origin. Although external injuries may appear minor in electrical burns, severe damage to deeper tissues often occurs, with the severity directly related to voltage level.[10]

The most common comorbidities were hypertension (HT), diabetes mellitus (DM), and coronary artery disease (CAD) (Table 1). In addition, 3.8% (n=6) of patients were diagnosed with schizophrenia and had sustained burns from fires they had initiated in their own homes.

Burns involving more than 20% of TBSA are classified as severe, as they trigger a cytokine storm that leads to pathophysiological changes not only at the burn site but also in remote tissues.[10-12] Therefore, our study included only patients with ≥20% TBSA burns. The mean TBSA burned was 42.7±17%, with mixed partial-thickness/full-thickness burns being the most prevalent type (69%). Patients were hospitalized in the burn ICU for an average of 26.7±19.8 days. As TBSA percentage and burn depth increased, so did the risk of mortality.

At ICU admission, patients had a mean Hb level of 15.3±3.1 mg/dL, which declined to 9.1±1.4 mg/dL at discharge. Unlike other types of trauma, early-stage burn trauma is characterized by intravascular fluid loss, which leads to hemoconcentration rather than anemia, thus explaining the initially elevated Hb levels observed upon ICU admission.[3,12] Early leukocytosis is also a common response to burn trauma. Patients' mean white blood cell (WBC) count at ICU admission was 22,016.3±11,257.7, decreasing to 12,493±10,004.9 by discharge.

Restrictive transfusion strategies are generally recommended for critically ill patients, those with gastrointestinal bleeding, post-cardiac surgery patients, and those with isolated troponin elevation due to cardiac ischemia, but not for acute coronary syndrome.[13,14] Due to extensive tissue loss and frequent surgical interventions, erythrocyte suspension (ES) transfusions are commonly employed in the treatment of severely burned patients.[3] In our study, the average number of ES transfusions per patient was 14.7±12.7. Although the commonly accepted practice has been to use a 1:1 ratio of ES to fresh frozen plasma (FFP), our findings revealed a ratio of 1.5:1. While the 1:1 ratio is not a strict guideline, patient-specific factors and a restrictive transfusion approach should guide transfusion practices. Vlaar APJ et al.[15] proposed a 2:1 ratio, although with a conditional recommendation and low certainty of evidence.

There was a weak and statistically insignificant inverse correlation between ES transfusion and patients' age, Glasgow Coma Scale scores, and APACHE II scores upon ICU admission ($p>0.05$). Greater burn depth and TBSA involvement were associated with longer ICU stays, which in turn necessitated more transfusions. We found a strong correlation between ICU length of stay and the number of ES transfusions ($p<0.001$, Table 2). There was also a weak association between ES transfusions and TBSA percentage ($p=0.045$), and an almost strong correlation with the number of escharotomy surgeries ($p<0.001$, Table 2). These findings suggest that the primary determinants of ES transfusion are the frequency of surgical interventions and prolonged ICU stays. Du et al.[3] also concluded that ES transfusion offers limited benefit for patient outcomes.

Consistent with the classification described by Lotterman et al.[14] we stratified patients into three groups based on their pre-transfusion Hb levels. Due to the retrospective nature of our study, the groups were not evenly distributed. Over five years, a total of 1242 ES transfusions were administered to 158 patients. In all three groups, Hb levels significantly increased post-transfusion, with most post-transfusion values remaining within the 7-10 mg/dL range ($p<0.042$, Table 3). Although restrictive transfusion was the goal, radical and hemorrhagic wound dressings and escharotomy procedures (mean 4.2±3.2 surgeries per patient, Table 1) necessitated anticipation of blood loss and the maintenance of existing Hb levels (Table 3). ES transfusions did not demonstrate a statistically significant impact on mortality ($p>0.05$, Table 4). As in the study by Heard et al.,[16] mortality increased in parallel with TBSA burned, a finding corroborated by our results.[16] No significant correlations were observed between ES transfusions and sex,

HT, or burn depth (p>0.05, Table 4).

Severe burns compromise skin integrity, suppress immune responses, increase invasive procedures, and prolong hospitalization, all of which render patients susceptible to bloodstream infections (BSIs).[17] Tang et al.[17] identified the five most common BSI pathogens in burn patients as *Acinetobacter baumannii*, *Klebsiella pneumoniae*, *Candida species*, *Pseudomonas aeruginosa*, and *Stenotrophomonas maltophilia*, with only five isolates of *Staphylococcus aureus*. Similar to the findings by Nitsani et al.,[18] numerous studies—including ours and that of Tang CQ—highlight the predominance of Gram-negative organisms in BSIs among burn patients.[17-19]

Among ES-transfused patients, coagulase-negative staphylococci (CNS) were the most frequently isolated pathogens in blood cultures (28.5%, n=45) (p=0.03, Tables 1 and 4). For accurate identification, at least two aerobic and anaerobic blood culture sets should be obtained from each patient, and CNS should be present in at least one bottle per set. Given that CNS are part of the skin flora, clinicians should exercise caution in distinguishing true bacteremia from contamination; if considered pathogenic, appropriate treatment should be initiated. Such isolations are common in burn patients due to disrupted skin integrity. The second most frequent isolate was *A. baumannii* (19.6%), followed by *P. aeruginosa*, *Enterococcus faecalis*, and *Candida species* (*C. parapsilosis* and *C. albicans*) (Table 1). When comparing the three most frequently isolated BSI pathogens in transfused patients, infections caused by CNS (p=0.03) and *P. aeruginosa* (p=0.03) were significantly more frequent (Table 4). No significant association was found between ES transfusions and *A. baumannii-related* BSIs (p=0.069, Table 4). Only two BSIs were caused by S. aureus.

Conclusion

Prolonged ICU stays, frequent surgical interventions, comorbidities, advanced age, and gastrointestinal bleeding increase the need for transfusion in burn patients. Although ES transfusion is an integral component of burn management, it should not be considered life-saving due to its associated risks, including the increased likelihood of BSIs. We recommend a restrictive transfusion strategy in burn ICU patients to minimize transfusion-related reactions and BSI risk while ensuring optimal patient support. Further prospective, multicenter studies are necessary to establish clear transfusion thresholds in burn ICU setting.

Ethics Committee Approval

The study was approved by the Kartal Dr. Lütfi Kırdar City Hospital Ethics Committee and was conducted in accordance with the principles of the Declaration of Helsinki. (Date: 24.01.2025, Decision No: 2025/010.99/12/23).

Informed Consent

Retrospective study.

Peer-review

Externally peer-reviewed.

Authorship Contributions

Concept: B.K., S.Y., E.B., N.B., G.F., R.C.; Design: B.K., S.Y., E.B., N.B., G.F., R.C.; Supervision: B.K., S.Y., E.B., N.B., G.F., R.C.; Fundings: B.K., S.Y., E.B., N.B., G.F., R.C.; Materials: B.K., S.Y., E.B., N.B., G.F., R.C.; Data collection &/or processing: B.K., S.Y., E.B., N.B., G.F., R.C.; Analysis and/or interpretation: B.K., S.Y., E.B., N.B., G.F., R.C.; Literature search: B.K., S.Y., E.B., N.B., G.F., R.C.; Writing: B.K., S.Y., E.B., N.B., G.F., R.C.; Critical review: B.K., S.Y., E.B., N.B., G.F., R.C.

Conflict of Interest

None declared.

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Yanık Yoğun Bakım Ünitesinde Kısıtlayıcı Transfüzyon Bir Hayal mi?

Amaç: Yanık yoğun bakım ünitelerine (YBÜ) yatırılan hastalarda kan transfüzyonu ihtiyacını artırmaktadır. Uzun süreli yoğun bakımda kalmayla paralel olarak kan dolaşımı infeksiyonları (KDİ) riski de artmaktadır. Bu çalışma, transfüzyon ve BSI arasındaki ilişkiyi incelemeyi ve kısıtlayıcı transfüzyon uygulamasını teşvik etmeyi amaçlamaktadır.

Gereç ve Yöntem: Hastanemizin yanık yoğun bakım ünitesinde beş yıl boyunca ciddi yanıkları (toplam vücut yüzey alanının %20'sinden fazla) olan 158 hasta tedavi edildi. Restriktif transfüzyon için hemoglobin (Hb) eşiği 7 g/dL, liberal transfüzyon için ise 10 g/dL olarak belirlendi.

Bulgular: Çalışmaya dahil edilen 158 hastanın %17.7'si (n=28) kadındı. Hastaların yaş ortalaması 41±15 yıldı. Yanık toplam vücut yüzey alanı (TBSA) ortalaması %42.7±17 (aralığı: %20-92) idi. Yanık nedenleri %79.2'sinde (n=125) alev, %10.1'inde (n=16) elektrik, %7'sinde (n=11) kaynar su, birer hastada (n=0.6) sıcak yağ ve buhar ve %2.5'inde (n=4) kimyasal maddelerdi. Hastaların %11.4'ünde (n=18) kısmi kalınlıkta yanık, %69'unda (n=109) karışık derinlikte (kısmi/tam kalınlıkta) yanık ve %19.6'sında (n=31) tam kalınlıkta yanık mevcuttu. Toplam transfüzyon sayısı ile yanık yüzdesi, yanık yoğun bakım ünitesinde kalış süresi, gerçekleştirilen eskaratomi sayısı, son hemoglobin (Hb), beyaz kan hücresi (WBC) sayısı ve taze dondurulmuş plazma (TDP) ünitesi sayısı arasında istatistiksel olarak anlamlı bir ilişki bulunmuştur ($p<0.05$). Eritrosit süspansiyonu (ES) transfüzyonlarının %72.5-86.8'inde kısıtlayıcı transfüzyon uygulanmıştır. KDİ'ler arasında en sık izole edilen patojenler %28.5 (n=45) oranında koagülaz negatif stafilokok (KNS), %19.6 (n=31) oranında *A. baumannii* ve %12.7 (n=20) oranında *P. aeruginosa* olmuştur. Transfüzyon sayısı ile *KNS* ve *P. aeruginosa* izolatlarının varlığı arasında istatistiksel olarak anlamlı bir ilişki bulunurken ($p<0.05$), *A. baumannii* izolatları arasında böyle bir ilişki bulunmadı ($p>0.05$). Candida türlerinin neden olduğu BSI oranı %4.5 (n=7) idi.

Sonuç: Yanık yoğun bakım hastalarında transfüzyonla ilişkili reaksiyonları ve KDİ riskini en aza indirirken optimum hasta desteğini sağlamak için kısıtlayıcı bir transfüzyon stratejisi öneriyoruz.

Anahtar Sözcükler: Kan dolaşımı enfeksiyonları; kısıtlayıcı transfüzyon; yanıklar; yoğun bakım ünitesi.