



OPTIMIZING BLOOD UTILIZATION: A RETROSPECTIVE ANALYSIS OF TRANSFUSION PRACTICES AND PATIENT OUTCOMES

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Abstract

Background: Blood transfusion plays a critical role in patient care. Clinicians must have clear guidelines for blood use to prevent misuse, minimize unnecessary exposure to donor antigens, and reduce the risk of adverse reactions and transfusion-transmissible diseases.

Objective: To analyse the Transfusion Practices and Patient Outcomes for Optimizing Blood Utilization

Study design: A retrospective study

Place and Duration : This study was conducted in Liaquat University of Medical and Health Sciences Hyderabad/Jamshoro from January 2023 to January 2024

Methodology: This study analysed the details of whole blood and blood components transfused over one month, correlating these with patient diagnoses and transfusion indications. Data were gathered from hospital records, including the blood bank and patient medical records. The information collected encompassed patient demographics (age, sex), diagnosis and clinical indications for transfusion, type and volume of blood components transfused (whole blood, packed red blood cells, platelets, plasma), the ward or department where the transfusion occurred, and the date and time of transfusion.

Results: A total of 250 blood units were administered, with whole blood being the most frequently used, followed by packed red blood cells. The surgical wards received the highest blood supply. Trauma patients, as well as those with malignancies and surgical needs, primarily required whole blood. Anemia emerged as the most common reason for blood product usage.

Conclusions: Regular assessment of blood component usage is essential for understanding and optimizing blood utilization patterns in hospitals.

Keywords: Blood Transfusion, Blood Utilization, Transfusion Indications, Retrospective Study, Patient Management

Introduction

Blood transfusion is a critical component of modern medical practice, essential for managing patients with various conditions, including trauma, surgery, anemia, and malignancies. Proper utilization of blood and its components is crucial to ensure patient safety, avoid adverse reactions, and optimize resource use. Despite advancements in blood transfusion practices, misuse and unnecessary transfusions remain significant concerns, potentially exposing patients to transmit antigens and transfusion-transmissible diseases [1-3].

Effective blood management strategies and regular audits of transfusion practices are necessary to address these challenges. Previous studies have highlighted the importance of stringent guidelines and periodic reviews to minimize inappropriate transfusions and enhance patient outcomes [4-6]. A comprehensive understanding of blood utilization patterns within a healthcare setting can inform policy-making and improve transfusion protocols [7-9].

In this context, our retrospective pilot study aims to analyse the details of whole blood and blood component transfusions over one month. By correlating transfusion data with patient diagnoses and indications, we seek to identify trends and areas for improvement in blood usage. This study is particularly relevant as it provides insights into the blood supply and demand dynamics, especially in surgical wards, where the highest utilization is often reported [10-12].

Moreover, understanding the primary indications for transfusions, such as anemia, trauma, malignancy, and surgical needs, can help refine clinical guidelines and promote evidence-based practices [13-15]. By examining the utilization patterns, we aim to contribute to the ongoing efforts to enhance blood transfusion practices and ensure optimal patient care.

Methodology

This retrospective pilot study was designed to evaluate blood transfusion practices and their correlation with patient diagnoses and clinical indications over a one-month period. Data were gathered from hospital records, including the blood bank and patient medical records. The information collected encompassed patient demographics (age, sex), diagnosis and clinical indications for transfusion, type and volume of blood components transfused (whole blood, packed red blood cells, platelets, plasma), the ward or department where the transfusion occurred, and the date and time of transfusion.

The study included all patients who received a blood transfusion (either whole blood or blood components) within the specified period. Patients with incomplete medical records or those who received transfusions outside the study period were excluded from the analysis. The collected data were analysed using descriptive statistics to determine the frequency and distribution of blood component transfusions across different wards and departments, as well as to correlate transfusion practices with patient diagnoses and clinical indications. Utilization patterns were also identified to determine the most common reasons for transfusion, such as trauma, malignancy, and anemia.

For statistical analysis, the data were entered into a database and analysed using statistical software SPSS version 26. Descriptive statistics, including mean, median, and standard deviation, were calculated for continuous variables, while frequencies and percentages were computed for categorical variables. The chi-square test was employed to assess the association between categorical variables, with a p-value of less than 0.05 considered statistically significant.

By employing this methodology, the study aimed to provide valuable insights into blood transfusion practices, identifying trends and areas for improvement to optimize patient care.

Results

During the study period, a total of 250 blood units were supplied. Whole blood was the most utilized product, followed by packed red blood cells. The highest consumption of blood units was observed in the surgical wards.

Patients with trauma constituted the largest group requiring transfusions, followed by those with malignancies and those undergoing surgery. Whole blood was predominantly required by these patient groups. Anemia was identified as the most common indication for the use of blood products, accounting for a significant portion of the transfusions.

The detailed analysis of blood component utilization revealed specific patterns across different clinical settings, underscoring the varied needs of patients based on their diagnoses and treatment plans. This data highlights the importance of continuous monitoring and review of transfusion practices to ensure efficient and appropriate use of blood resources.

Table 1: Blood Component Utilization

Blood Component	Number of Units	Percentage (%)
Whole Blood	110	44.0
Packed Red Blood Cells	85	34.0
Platelets	32	12.8
Plasma	23	9.2
Total	250	100

Table 2: Blood Units Supplied to Different Wards

Ward/Department	Number of Units	Percentage (%)
Surgical Wards	104	41.6
Trauma Ward	76	30.4
Oncology Ward	42	16.8
Other Wards	28	11.2
Total	250	100

Table 3: Indications for Blood Transfusion

Indication	Number of Units	Percentage (%)
Anemia	140	56.0
Trauma	62	24.8
Malignancy	35	14.0
Surgery	13	5.2
Total	250	100

Discussion

Our retrospective pilot study provides valuable insights into blood transfusion practices within our healthcare facility. Whole blood emerged as the most frequently utilized blood product, underscoring its critical role in emergency settings such as trauma and surgical procedures [1, 2]. This preference highlights the practicality of whole blood in situations where rapid transfusion is essential for patient stabilization and management.

Comparing our findings with those of other studies reveals consistent trends in blood product utilization across different healthcare settings. For instance, a study by Stanworth et al. also found that whole blood was extensively used in surgical patients, emphasizing its role in perioperative care and trauma management [16]. Similarly, Goodnough et al. discussed strategies to reduce unnecessary blood transfusions, aligning with our emphasis on optimizing blood utilization to enhance patient safety and resource allocation [17].

Our study identified surgical wards as the primary area of blood product usage, consistent with findings from Carson et al., who analysed blood transfusion practices in elective surgical patients and reported high transfusion rates in surgical settings [18]. This convergence underscores the ongoing challenge of managing blood resources efficiently in perioperative care.

In terms of indications for transfusion, trauma emerged prominently in our study, consistent with Leahy et al., who emphasized trauma's significant impact on blood usage patterns and the need for

timely interventions [19]. Additionally, the prevalence of anemia as a leading indication aligns with global transfusion practices aimed at addressing hemoglobin deficits and improving patient outcomes, as noted by Mueller et al. [20].

Understanding these utilization patterns is crucial for developing evidence-based transfusion protocols tailored to specific clinical contexts. Standardized guidelines can help mitigate risks associated with transfusions, such as adverse reactions and transfusion-transmitted infections, thereby enhancing patient safety and optimizing resource allocation [3].

Conclusion

In conclusion, our study contributes valuable insights into blood transfusion practices by identifying utilization patterns and indications within our hospital setting. By comparing our findings with existing literature, we underscore the importance of tailored transfusion strategies and continuous monitoring to improve clinical outcomes and patient care.

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Permission

Taken from the ethical committee

Conflict of interest

None

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