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EVALUATION OF THE INDICATIONS OF BLOOD TRANSFUSION IN BAGHDAD TEACHING HOSPITAL

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ABSTRACT

Background: Blood transfusions are used in medical, surgical, and obstetric wards to replace acute or chronic blood loss. Special criteria now govern replacements. Aim of study: To evaluate the indications, effectiveness, and response of blood transfusions in patients admitted to Baghdad teaching hospital. **Method:** Our research comprised 160 blood transfusion recipients (65 men and 95 females) from Baghdad Teaching Hospital's general medicine, haematology, surgery, obstetrics, and gynaecology wards from October 2011 to October 2012.Patient gender, age, blood group, ward, pre- and post-transfusion PCV/heamoglobin, number of transfused units, type of transfused blood (whole blood or packed RBCs), past blood transfusion history, co-morbid diseases that affect oxygenation, indication of blood transfusion, and patient response were collected. Results: Most blood transfusions occurred pre-operatively (38.125%) and for haematological conditions/chemotherapy (25%). In general wards, upper GIT bleeding was the top reason (27.5%), while in haematology, acute myeloid leukemia led (45%). The majority of transfusions involved patients with a PCV under 30% (Hb < 10 g/dl). Packed RBCs were commonly used in general and haematology wards, while surgical and OB/GYN wards primarily used whole blood. Symptoms were relieved in 93.4% of symptomatic patient's post-transfusion. **Conclusion:** There is an overuse of blood transfusions in surgical, obstetrics, and gynecology wards, with some patients having pre-transfusion hemoglobin levels over 13.5 g/dl, despite WHO discouraging single-unit transfusions. These wards also contravene guidelines by using whole blood instead of packed RBCs. Upper GIT bleeding and acute myeloid leukemia are the primary reasons for transfusions in general medicine and hematology wards, respectively, while pre-operative preparation is the main indication in surgical and OB/GYN wards.

KEYWORDS: Evaluation, Indications, Blood, Transfusion, Baghdad Teaching, Hospital.

INTRODUCTION

Ood transfusions are a critical and lifesaving intervention in modern medicine, employed to treat conditions such as severe anemia by replenishing the body's hemoglobin levels and thus enhancing its oxygen-carrying capacity. While the benefits of transfusions can be substantial, they are not devoid of risk. The potential for transmission of infectious diseases and other complications associated with blood transfusions underscores the need for meticulous risk-benefit assessments and adherence to evidence-based transfusion practices.[1] The paramountcy of quality and safety in blood transfusion services cannot be overstated, necessitating the consistent and rigorous testing of blood components to avert the transmission of both known and emerging pathogens.[2] The concept of clinical appropriateness further anchors the use of these critical interventions, mandating that they are not only effective but also judiciously applied to conditions where the benefit significantly outweighs the potential risks. This tenet is fundamental in managing healthcare expenditures and ensuring that interventions are resource-efficient.[3] A historical perspective reveals that the transfusion landscape was revolutionized with the discovery of the ABO blood group system by Landsteiner in 1900, significantly reducing the risk of incompatibility reactions. The subsequent establishment of blood banks and advancements in storage techniques have enabled a broader application of transfusion medicine, complementing other medical specialties such as surgery, anaesthesia, and intensive care. As knowledge of transfusion-transmitted diseases has

expanded, so too has the impetus for a more conservative approach to the administration of blood products [4]. In the clinical realm, red blood cells (RBCs) carry the torch as the primary vehicles of oxygen delivery to tissues, with hemoglobin serving as the crucial protein for oxygen binding. The body has evolved intricate compensatory mechanisms to manage various hemoglobin levels, safeguarding against the threat of hypoxemia, particularly in vital organs like the heart, which is especially vulnerable due to its high oxygen demand.[5] The decision to administer a blood transfusion is influenced by a multitude of clinical factors, including observable symptoms such as fatigue, shortness of breath, and changes in mental function, as well as objective measurements like blood pressure and heart rate. These indicators become particularly salient in acute blood loss scenarios.[1] While a hemoglobin threshold of 10 g/dl once served as a standard benchmark for transfusions, current guidelines suggest that many patients can safely tolerate lower levels, with evidence demonstrating successful surgical outcomes in Jehovah's Witnesses with hemoglobin levels above 8g/dl.[6,7] Modern transfusion guidelines advocate for a more conservative approach. For instance, in cases of acute blood loss, transfusions might not be indicated until blood volume loss exceeds 30%. Similarly, a hemoglobin concentration below 7 g/dl is often the threshold for considering RBC transfusions, with the understanding that individuals with pre-existing cardiorespiratory conditions may require a higher threshold.[8] This more conservative strategy has been found to be beneficial in critical care settings[9], while in the management of chronic anemias, the focus is on symptom relief rather than restoring hemoglobin to normal levels, employing alternative treatments such as recombinant erythropoietin where appropriate.[10,11] For specific conditions like β-thalassaemia and sickle cell disease, transfusion protocols are customized to manage particular risks, such as preventing strokes or managing vaso-occlusive crises.[12,13] Ultimately, the decision to transfuse should be personalized, relying on clinical judgment, patient-specific symptoms, hemoglobin levels, and underlying health conditions, complemented by ongoing audits and reviews to ensure the highest standards of patient care.[14,15] Study's purpose to assess the usefulness and indications of blood transfusions in the medical, surgical, obstetric, and haematology wards of the Baghdad Teaching Hospital, as well as their relationship to a variety of factors including the ward, gender, history of prior transfusions, and prior medical history.

METHOD

Observational cross-sectional analysis. Done in Baghdad Teaching Hospital. The research was conducted over a one-year period from October 2020 to October 2022. Participant Demographics: This study included 160 patients who underwent blood transfusions (either whole blood or packed red blood cells (RBCs)) across various departments at Baghdad Teaching Hospital, including general medicine, hematology, surgery, obstetrics, and gynecology, with an allotment of 40 patients per department. Inclusion criteria consisted of patients who had completed blood transfusion treatment and for whom both pre- and post-transfusion hematocrit (PCV)/hemoglobin (Hb) levels were available. Exclusions were applied to those not meeting these criteria. Patient information was compiled from medical records and consultations with attending resident physicians.

Data Collected for Each Patient Included

1. Sex.
2. Age.
3. Blood type.
4. Hemoglobin levels and hematocrit values before and after transfusion.
5. Whether whole blood or packed RBCs were transfused.
6. Quantity of transfused blood units.
7. History of prior blood transfusions.
8. Presence of comorbid conditions, such as heart failure, myocardial infarction, among others.
9. Reasons for administering a blood transfusion: a. Acute hemorrhage: assessed by shock symptoms (pulse rate > 130/min, systolic blood pressure < 90 mmHg, or postural hypotension), or based on PCV/Hb readings. b. Severely ill patients: whether admitted to the ICU or otherwise. c. Perioperative cases: assessed by symptomatic presentation or PCV/Hb levels. d. Chronic anemia: diagnosis clarification and determination of symptomatic presence or based on PCV/Hb measurements. e. Hematologic disorders: diagnosis specification and assessment based on symptomatic presence, PCV/Hb levels, or as preparation for chemotherapy.
10. Effectiveness of blood transfusion in alleviating symptoms for those who were symptomatic.

Statistical Analysis Approach: The study utilized a cross-sectional methodology. The collected data were systematically encoded and organized utilizing counts, percentages, averages, and standard deviations. Statistical software such as SPSS and Microsoft Excel was used for data analysis, including examining associations between various factors. A p-value of 0.05 or less was considered indicative of statistical significance.

RESULTS

We found that 92.5% of the patients who received blood in the general medicine wards had a pre-transfusion PCV value less than 30%; compared with 7.5% who had a pre-transfusion PCV more than, or equal to 30%. In haematology wards, all patients who received blood had a pre-transfusion PCV less than 30%. While in surgical wards, we found that 62.5% of patients had a pre-transfusion PCV less < 30%, compared with 37.5% ≥ 30%. In the obstetrics & gynecology wards we found that 52.5% of the patients had a pre-transfusion PCV

values < 30%; compared with 47.5% who had a pre-transfusion PCV ≥ 30%.

Table 1: Distribution of patients according to pre-transfusion PCV less or more than 30% in all wards of study.

general medicine wards	Frequency	% in the specified unit	% overall
< 30 %	37	92.5%	23.125%
≥ 30 %	3	7.5%	1.875%
Total	40	100%	25%
in hematology wards	Frequency	% in the specified unit	% overall
< 30 %	40	100 %	25 %
≥ 30 %	0	0 %	0 %
Total	40	100%	25 %
surgery wards	Frequency	% in the specified unit	% overall
< 30 %	25	62.5 %	15.625 %
≥ 30 %	15	37.5 %	9.375 %
Total	40	100 %	25 %
obstetrics & gynecology wards	Frequency	% in the specified unit	% overall
< 30 %	21	52.5 %	13.125 %
≥ 30 %	19	47.5 %	11.875 %
Total	40	100 %	25 %

Regarding the type of blood transfusion (packed RBCs versus whole blood) we found that 65% of patients in general wards received packed RBCs compared with 35% who received whole blood. While in haematology wards; we found that 95% of patients received packed RBCs, compared with 5% of patients who received whole blood. In the surgical wards; all patients received whole blood. Also all patients in the obstetrics & gynecology wards have received whole blood. As shown in table 2.

Table 2: distribution of patients according to Whole blood and Packed RBC in all wards of study.

medicine wards	Frequency	%
Whole blood	14	35 %
Packed RBC	26	65 %
Total	40	100 %
hematology wards	Frequency	%
Whole blood	2	5 %
Packed RBC	38	95 %
Total	40	100 %
surgery wards	Frequency	%
Whole blood	40	100 %
Packed RBC	0	0 %
Total	40	100 %
G&O	Frequency	%
Whole blood	40	100 %
Packed RBC	0	0 %
Total	40	100 %

DISCUSSION

The study you've described focuses on evaluating blood transfusion practices in various hospital wards, emphasizing the importance of adhering to established guidelines, such as those set by the British Committee for Standards in Haematology and the American Association of Blood Banks. These guidelines are critical in ensuring the appropriateness and safety of transfusions. One key finding is the observation of pre-transfusion hemoglobin levels across different wards: general medicine, haematology, surgery, and obstetrics/gynecology, highlighting the variance in transfusion practices. In general medicine and haematology wards, most patients had pre-transfusion packed cell volume (PCV) below 30% (hemoglobin < 10

g/dl), suggesting adherence to guidelines that recommend transfusions for patients with hemoglobin levels below this threshold. However, this practice was less consistent in surgical and obstetrics/gynecology wards.[16] The study also notes the prevalence of multiple blood transfusions in haematology wards, attributed to the nature of hematological diseases. In contrast, a higher proportion of patients in surgical and obstetrics/gynecology wards received only a single unit of blood, a practice discouraged by the World Health Organization due to potential risks. The type of blood transfusion (packed RBCs vs. whole blood) also varied across wards. The majority of general medicine and haematology patients received packed RBCs, whereas patients in surgical, obstetrics, and gynecology wards predominantly received whole blood.[17] Indications for blood transfusions were diverse, ranging from pre-operative transfusions, treatment for hematological diseases, acute blood loss, chronic diseases, to critical care situations. Specific patterns emerged in different wards; for example, the main indication in general medicine wards was upper gastrointestinal bleeding, while in haematology wards, it was acute myeloid leukemia.[18] Lastly, the study indicates a high rate of symptomatic relief following transfusions, underscoring their effectiveness when appropriately administered. This research highlights the need for consistent documentation and adherence to guidelines to ensure the safe and effective use of blood transfusions in hospital settings.[19]

CONCLUSION

In Baghdad Teaching Hospital, a trend was observed of administering transfusions to surgical, obstetric, and gynecology patients with hemoglobin levels over 10 g/dl, often using whole blood and typically limiting it to a single unit. The most common indications for transfusion were upper GI bleeding in general medicine and acute myeloid leukemia in hematology. Pre-operative preparation dominated the reasons in surgical and gynecological wards, with most anemic patients reporting symptom relief post-transfusion.

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