Audit of the Blood Bank in the Department of Haematology and Blood Transfusion Bowen University Teaching Hospital, Ogbomoso, Oyo State, Nigeria

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ABSTRACT

Background:
Many blood banks in Nigeria are not standardized, sensitization is poor and paid donation is common; thus blood is scarce and need prudent management.

Aims and Objectives:
The aim of this study was to conduct an audit of the blood transfusion practice in Bowen University Teaching Hospital (BUTH).

Materials and Methods:
A retrospective study was carried out using the transfusion laboratory request forms and blood bank cross match register. The bio data of the patients were obtained; clinical diagnosis and requesting unit, the appropriateness of the transfusion request and the transfusion/cross match (C/T) ratio were assessed.

Results:
A total of 357 request forms were assessed. The median age of the patients was 31 years (range 1 day - 90 years), 29% had no data for age written on the forms. About 49.9% were male and 1.7% had no data for gender. Most requests were from adult emergency department (38.7%). Requests for whole blood constituted 51.8% while 3.1% were packed cells and 45.1% had no specific request. There was no indication for transfusion in 27.5%. The percentage appropriateness of blood product use was 30.1%. The C/T ratio of the hospital was 2.1.

Conclusion:
Blood transfusion requests were predominantly from adult emergency unit with whole blood being the most used product. Pre-analytic errors were common and the C/T ratio was high.

Keywords: blood bank, audit, cross- match, transfusion

INTRODUCTION

Transfusion of blood products is a vital part of modern medicine. It has resulted in the development of life saving techniques and improved emergency medical services.[1]Transfusion of blood products and components are however not without serious and sometimes life threatening hazards. In an effort to minimise risks to recipients, WHO/NACO has provided guidelines for the appropriate use of blood products and components and many countries have adapted these guidelines to suit their needs.[2] In reality however, there is still a high rate of inappropriate use of blood worldwide particularly in developing countries.[3, 4]This situation is worsened by an inadequate supply of suitable donors.[5] To improve efficiency and reduce wastage, quality control programmes are indicated. Quality assurance measures are regularly implemented in many institutions in the form of a clinical audit of blood banking services. A clinical audit of any blood banking services compares the existing practises with an agreed upon standard, it permits

comparison between institutions and results in a routine order schedule adopted by the institution. [6, 7]Blood bank audits can focus on any the following processes: pre-analytic, analytic and post-analytic. A series of audits performed by Plebani (2010) reported that errors of the pre-analytic process are the commonest sources of error in transfusion services, accounting for 46-68% of all errors and they usually originate from inappropriate and improperly filled test requests and entries. [8] An audit of the blood requisition forms are considered important enquiries into the pre-analytic processes governing blood transfusion services.[6]

MATERIALS AND METHODS

The audit was conducted in the blood bank, Bowen University Teaching Hospital (BUTH), Ogbomoso, a faith-based tertiary teaching hospital with a 300 bed capacity. This is a retrospective descriptive study aimed at assessing the blood transfusion practices in the hospital. All the transfusion laboratory request forms and the blood bank cross-match register entries from the 1st January 2017 to 31st April 2017 were analysed. A total of 357 laboratory transfusion request forms were sent to the blood bank of BUTH within the study period of four (4) months. Information obtained from the laboratory request forms were age, sex, requesting unit, clinical diagnosis, previous transfusions, whether patient had suffered a previous transfusion reaction, and indication of transfusion. The appropriate use of blood products and components was assessed with the use of the WHO guidelines. [2] A transfusion episode was considered appropriate if the indication for transfusion and the haemoglobin concentration were indicated. [2] The cross-match/transfusion (C/T) ratio was a simple ratio of number of cross-matches requested over the number of units actually transfused.

RESULTS

The study included 357 patients for whom blood requests were made to the blood bank between 1st January 2017 and 31st April 2017. All the

blood request forms had at least one missing data variable. All the forms however had patient surname and first name. Among the 357, 48.5% were female and 49.9% were male and 6 (1.7%) had no data for gender (Table 1).

Table 1: Gender Distribution

Gender	N (%)
Male	178 (49.9)
Female	173 (48.5)
No data	6 (1.7)
Total	**357 (100)**

Of the 357 laboratory request forms analysed, 256 (71%) had ages while 101 (29%) had no data for age written in the forms. The median age of the patients from the laboratory request form was 31 years (range 1 day - 90 years). The adult emergency department made the most requests for blood products (38.7%; Table 2). One hundred and eighty five (51.8%) of all the blood requests were for whole blood, 11(3.1%) were for packed cells and 161(45.1%) did not specifically request for any blood component. Only 78 (27.5%) of the forms specified the indication for transfusion. The percentage appropriateness of blood product use was 30.1%. (Table 3). The C/T ratio of the Bowen University teaching Hospital was 2.1 (Table 2). Only one form stated whether or not the patient had a previous blood transfusion reaction.

DISCUSSION

Approximately 3,500 patients attend Bowen University Teaching Hospital per year and the blood bank is a key service of the hospital. In order to evaluate the safety of the service, an audit of laboratory operations was performed. In the pre-analytic phase of this audit the level of completion of laboratory request forms as completed by physicians was low.

Most of the variables were poorly filled, although variables like patient's first name and surname were almost always present. At least one of other variable like date of birth, age, or gender of patient and the test requested was usually absent. This is comparable to similar studies done where only the patients' full name were stated on the request forms they

Table 2: Blood transfusion requests by hospital wards

Ward	Number of requests (%)	Cross-match/ Transfusion Ratio
Adult emergency	138 (38.7)	3
Paediatric emergency	49 (13.7)	1.7
Male medical	13 (3.6)	1.2
Male surgical	40 (11.2)	1.4
Female medical	10 (2.8)	1.7
Female surgical	26 (7.3)	1.6
Gynaecology	14 (3.9)	2.8
Maternity centre	26 (7.3)	2.2
Neonatal unit	27 (7.6)	2.2
Theatre	3 (0.8)	1.5
No data	11 (3.1)	2.2
Total	**357 (100)**	**2.1**

Table 3: Appropriateness and Inappropriateness of various blood components

Component	Appropriate Transfusion [N (%)]	Inappropriate Transfusion [N (%)]	Total
Whole blood	56 (30.2)	129 (69.8)	185 (100)
Packed cells	3 (27.2)	8 (72.8)	11 (100)
Total	**59 (30.1)**	**137 (69.9)**	

evaluated. [9,10] Improperly completed request orders make up a large proportion of causes of pre-analytic errors in the blood bank and this continued to plague blood bank services in general. [11] Makubi *et al* (2012) found that as many as 82.2 % of request forms had at least one missing variable but in this review, all the forms had at least one missing variable or the other. [12] Other irregularities such as inappropriate use of blood have been reported to be on the increase in many countries, even developed countries. [13] In that study, carried out in Iceland, at least 6% of RBCs, 14% of FFPs and 33% of platelets were not transfused according to the guidelines at the ICU. In this study, 68.9% of the red cell transfusions were inappropriate because the haemoglobin concentration was not indicated. Other important issues that must be tackled include wastage of blood represented by a high C/T ratio. In a study by Olawumi and Olatunji (2004), the C/T of a teaching hospital in Nigeria was 2.2 and Belayne *et al* (2013) found that the overall C/T ratio in a general hospital in Ethiopia, was 2.3 [14, 15], while in this study, the C/T ratio was 2.1. This is the first audit of the blood transfusion services in BUTH and it provides baseline data. With an appropriate study design to assess the implementation of guidelines adapted to suit our needs, it will also serve as comparison in evaluating the utilization of the guidelines.

CONCLUSION

An audit is a vital tool in capacity building for health care systems particularly in a developing country like Nigeria. Problems with analytical processes in the blood bank must be identified, and solutions proffered. This study dealt with problems in the pre analytic processes of the blood bank at Bowen University Teaching Hospital.

Conflict of Interest:

The authors have no conflict of interest.

Author's Contributions:

KJO-A and TAO initiated the study while GHA-E, AOA, OOA and LS contributed to the study design and writing of the paper.

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