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Evaluation of Blood Transfusion Request form: The Experience in a Tertiary Health Facility in Jos, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author JED designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author ICU managed the analyses of the study. Authors OCN and DOD managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: There is a thin line between a safe blood transfusion and transfusion-related fatality hence the need to be diligent in every aspect of the blood transfusion process. Appropriate and complete documentation on a blood transfusion request form is one of the most important preanalytic activities serving as a communication tool between the clinician and the blood transfusion laboratory personnel.
Aims: To evaluate compliance with appropriate and complete documentation of information on our blood transfusion request forms for a reliable preanalytic process towards an efficient blood transfusion service.
Study Design: It is a retrospective study.

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Place and Duration of Study: Blood Bank of the Jos University Teaching Hospital between January to December 2023.
Methodology: Six thousand, three hundred and sixty (6360) blood transfusion request forms from the Jos University Teaching Hospital Blood bank were evaluated for complete or incomplete documentation retrospectively and results were presented in frequencies and percentages.
Results: There was 100% compliance in filling in the patients' surnames and other names as well as the laboratory number and blood groups of the patients while only 4779 (75.14%) filled in the patients' ages with 1416(22.26%) using the prefix of adult(ad) while 165(2.59%) fail to document the patients' age. There were 2829 (44.48%) males with 3522 (55.38%) females while no sex was indicated in 9 of the reviewed forms. Obstetrics history has the least cumulated documented response of 0.38% while a significant 1008 (15.85%) did not indicate either blood grouping or blood grouping with cross-match request.
Conclusion: Appropriate and complete documentation of information on blood transfusion request forms is a problem among clinicians and will require continuous education on its importance, periodic auditing, provision of electronic data system and attitudinal change for a better blood transfusion compatibility service.

Keywords: Blood transfusion; compliance; evaluation; request form; services.

1. INTRODUCTION

Blood transfusion is an integral part of clinical practice worldwide with the need for blood arising from several medical and surgical diseases, interventions, and complications. Blood transfusion medicine has evolved over the years from being a laboratory procedure to the entirety of clinical practice with the provision of safe blood at the centre of this life-saving medical procedure. While much emphasis regarding transfusion safety is concentrated on blood donors, donation processes, recipients, and the transfusion process, a major pretransfusion activity like the appropriate filling of information on the transfusion request form seems to have been neglected despite its potential to complicate blood transfusion in its entirety. Haematology and blood transfusion services require that the right test is carried out on the right specimen with the correct result issued to the appropriate recipient within a reasonable time thereby guaranteeing quality assurance [1]. This quality can only be achieved by also appropriately filling in information on a transfusion request form an aspect in the preanalytic component of an acceptable laboratory quality assurance system without which reliability, efficiency, and utilization of blood transfusion service will not be guaranteed. Clinical details concerning patients' biodatas', clinical presentation, clinical diagnosis, and other important details are often not documented on request forms [2]. Carraro and a colleague in a study in Italy reported that 61.9% of laboratory errors occur due to preanalytic errors with analytical and post-analytical errors accounting for 15% and 23.1% respectively [3]. An evaluation of haematology laboratory request forms in a Kenyan tertiary health centre and a study from Ghana indicated that the appropriate completion of request forms was poor [4,5]. The findings in several other studies in Nigeria were not different with Adegoke and his colleagues reporting that the only well-documented information in their laboratory request forms evaluation in Ile-Ife, Nigeria was the patients' name [6,7]. The Majority of these reports were multidisciplinary and on general laboratory requests with none specifically on blood transfusion request forms despite its complexity and sometimes irreparable complications in our environment. This evaluation is aimed at determining the extent of complete or incomplete information documentation by clinicians on blood transfusion request forms for the purpose of raising awareness on the menace of incomplete information documentation and the importance of complete information documentation for a safer blood transfusion compatibility processes.

2. MATERIALS AND METHODS

2.1 Study Design

This study is a retrospective study conducted in the Jos University Teaching Hospital Blood Bank. The hospital is a major tertiary health centre in the North-Central region of Nigeria serving as a referral centre to other hospitals within the State and surrounding States of Bauchi, Nassarawa, Benue, Taraba, Kaduna, and some areas within the Federal Capital Territory, Abuja.

Six Thousand, three hundred and sixty (6,360) blood transfusion request forms obtained from the hospital blood bank between January 2023 and December 2023 were evaluated.

2.2 Data Collection Method

All information on the hospital blood transfusion request form was analyzed using the Microsoft Excel 2010 and Epi info Version 7.2.5.0 data analysis software. This information includes the Surname and other names of the patient, age, sex, Ward, Hospital number, Clinician/Consultant, Haemoglobin Electrophoresis if known, clinical diagnosis, patient blood group if known, history of previous transfusion, date of the transfusion and previous transfusion reaction. Other information required are obstetrics history, type of request either blood group only or blood grouping and cross-matching, number of units required, whole blood or any other blood component, date and time required, degree of urgency then the date the request was made, and requesting doctor's signature. The last segment on the form is for laboratory use where laboratory numbers and blood groups (ABO and Rh) are recorded.

Frequency distribution tables and percentages were created to summarise the data collected.

3. RESULTS

A total of twenty-four (24) variables on the Jos University Teaching Hospital Blood Transfusion Request Forms were considered. These variables were grouped into; Patient information, Clinician information, Clinical information, and Specimen information. Information obtained from the 6,360 blood transfusion request forms reviewed indicated that all the forms had the surnames and names of the patients appropriately documented at 100% while only 4,779 (75.14%) had their age documented with 1,416(22.26%) documented as adults and 165 (2.59%) had no record of age. Wards or clinics where the request originated from were indicated in 5501 (86.5%) while hospital number was documented on 4456 (70.06%) of the reviewed blood transfusion request forms. The names of consultants in charge were recorded in 6345 (99.76%) of the request forms while only 78 (1.23%) of the patients had records of their known Haemoglobin electrophoresis results with no records for 6273 (98.63%) while 9 (0.14%) were documented as not known. Two hundred and twenty-five (3.52%) of the request had no diagnosis written with 6135 (96.46%) appropriately documented. Information provided on previous transfusion and date of transfusion, previous transfusion reaction, and obstetrics history for pregnant clients were documented in 4.53%, 0.75%, and 0.24% of evaluated forms respectively. Significant requests made were for grouping and cross-matching, 5337 (83.92%) while paradoxically 1008 (15.85%) did not make any specific request with 15(0.24) requesting for blood grouping only. Whole blood requests accounted for 6120 (96.23%) while other blood products recorded 54 (0.85%). Request for 2 units of blood predominates with 3462 (54.43%) while the highest request for 10 units was 6 (0.09%). No number of units required was indicated in 12 (0.19%) of the request forms reviewed (Table 1a, 1b and 1c).

Table 1a. Evaluated parameters with their frequencies and corresponding percentage

Parameters	Variables	Frequency (n)	Percentages (%)
Patient information	**Surname**	6360	100.00
	First name	6360	100.00
	Age		
	Yes	4779	75.14
	Adult	1416	22.26
	Nil	165	2.59
	Sex		
	Male	2829	44.48
	Female	3522	55.38
	Nil	9	0.14
	Ward/Clinic		
	Yes	6118	96.19
	Nil	242	3.81
	Hospital Number		
	Yes	5754	90.48
	Nil	606	9.52
	Blood Donation		
	Donated	48	0.75
	Not Donated	10	0.16
	Nil	6302	99.09

Table 1b. Evaluated parameters with their frequencies and corresponding percentage

Parameters	Variables	Frequency (n)	Percentages (%)
Clinician Information	**Clinician/Consultant**		
	Yes	6345	99.76
	Nil	15	0.24
	Requesting Doctors Signature		
	Yes	4119	64.76
	Nil	2241	35.24
Clinical Information	**Patient blood group (If known)**		
	Yes	456	7.17
	Not known	12	0.19
	Nil	5892	92.64
	Haemoglobin Electrophoresis (If Known)		
	Yes	78	1.23
	Not Known	9	0.14
	Nil	6273	98.63
	Previous Transfusion/Date		
	Yes	288	4.53
	No	315	4.95
	Not known	978	15.38
	Nil	4779	75.14
	Previous Transfusion Reaction		
	Yes	48	0.75
	No	282	4.43
	Not Known	1011	15.90
	Nil	5019	78.92
	Obstetrics History		
	Yes	15	0.24
	Not known	9	0.14
	Nil	6336	99.62
	Clinical Diagnosis		
	Yes	6135	96.46
	Nil	225	3.54

Table 1c. Evaluated parameters with their frequencies and corresponding percentage

Parameters	Variables	Frequency (n)	Percentages (%)
Specimen Information	**Request**		
	Grouping and Cross-matching	5337	83.92
	Blood grouping only	15	0.24
	Nil	1008	15.85
	Blood product Required		
	Whole Blood	6120	96.23
	Others	54	0.85
	Nil	186	2.92
	Number of Units Required		
	1	1479	23.26
	2	3462	54.43
	3	945	14.86
	4	399	6.27
	5	15	0.24
	6	36	0.57
	7	00	0.00
	8	6	0.09
	9	00	0.00
	10	6	0.09
	Nil	12	0.19
	Date Required		
	Yes	5799	91.18
	ASAP*	135	2.12
	Nil	246	6.70
	Time Required		
	Yes	897	14.10
	ASAP*	3108	48.87

Parameters	Variables	Frequency (n)	Percentages (%)
	Now	3	0.05
	Urgent	84	1.32
	Very Urgent	9	0.14
	Date	123	1.93
	AM**	123	1.93
	PM***	144	2.26
	Nil	1869	29.39
	Degree of Urgency		
	0	252	3.96
	1	498	7.83
	2	588	9.25
	3	730	11.48
	4	1929	30.33
	Nil	2373	37.31
	Date of Request		
	Yes	6336	99.62
	Nil	24	0.38
	Laboratory Results		
	Blood Group	6360	100.00
	Laboratory Number	6360	100.00

ASAP: As Soon As Possible, AM**: Ante Meridiem, PM***: Post Meridiem*

4. DISCUSSION

A laboratory request form of any kind is a major tool of communication between the clinician and the laboratory personnel made up of the laboratory physician and the medical laboratory scientist or technologist [8]. Efficient patient management hinges on appropriate laboratory output more so investigations that have to do with the provision of a safe blood unit for transfusion to patients presenting with several multi-specialist disease conditions. It's been reported that laboratory reports account for 60-70% of clinical information required in the appropriate management of patients in our hospital settings [9]. The importance of careful information check in pretransfusion testing cannot be overemphasized. A successful and safe blood transfusion process begins from the moment a clinician decides to transfuse a patient and it is indicated by filling out a blood transfusion request form. The medical laboratory personnel at the transfusion service laboratory will use the patients' information on the request form to compare and confirm the information on the sample label. Documentations on the request form also include the date a request is made, the degree of urgency, and the time a cross-match unit is required as well as patient serological, and transfusion history which must be checked with the aim of comparing current investigation findings with those of previous investigations. This helps in selecting the appropriate blood product or component at the appropriate volume and timing and also aids in resolving discrepancies before blood is released for transfusion. Failure to appropriately document this information can affect the outcome of the transfusion process hence the need for clinicians to ensure every required information is documented on the request form. The only patients' information adequately and completely documented in our studies was the patients' surname and other names while other parameters had variable levels of incompleteness and use of inappropriate terminologies. Complete documentation of patients' names may be due to it being compulsory for payment and confirmation at the point of sample collection otherwise samples are rejected. This finding is supported by a previous study on general medical laboratory request forms in Jos which indicated that the names of patients were the only information appropriately documented [10]. Other reports from Niger Delta University Teaching Hospital in the South-South region of Nigeria and another from Ile Ife in the South Western region of Nigeria presented similar findings with some exceptions on the other variables so also a report from an Iranian study on the adequacy of information in histopathology request form [11,12]. A contrasting report was however seen in a study conducted by Oyelekan and colleagues where they reported a slightly different result when compared with our study [13]. This difference may not be unconnected to the fact that their sample size was lower and the study was conducted on general laboratory request forms compared to our study on blood transfusion request form with a larger sample size and several variables. Documentation of patients' numeric age is a major determinant of a lot of processes owing to some physiological and

metabolic variations unique to certain ages with the potential to alter certain clinical laboratory values and subsequent interventions like blood transfusion. Certain ages are also associated with multiple medical conditions requiring different interventions that can affect clinical laboratory findings in some instances patients' blood groups are altered [14]. While other studies only indicated the completeness or absence of documented age numerically, our finding indicated that several clinicians have adopted the use of the prefix, adult(Ad) in place of actual age while some skip documenting the age of their patients while filling the blood transfusion request forms. This action may be attributed to high patient to doctor ratios in developing countries like ours making clinicians skip documenting certain informations so as to gain time to attend to other patients. Blood transfusion in several occasions like road traffic accidents, crisis situations with mass casualties, and obstetric haemorrhages are often emergencies that require prompt action which could make clinicians fill these forms in a rush thereby skipping certain vital informations. While these occurrences are sometimes inevitable, clinicians should understand that haematologic parameters like haemoglobin concentration and packed cell volume among many other physiologic parameters are age specific and are very important in determining the volume of blood products or components required for individual patients [15]. The use of prefixes is counter-productive in terms of data generation for research and training and could also affect laboratory conclusions significantly. There was a slight compliance with documentation of patients' sex with females dominating when compared to males. This significant compliance with sex documentation may not be unconnected with the fact that there is an acceptable prefix for male ‘m’ and female ‘f’ which is easier to document while filling these forms. The dominating female population could be linked to the higher health-seeking behaviours of females compared to males [16]. Similarly, certain haematologic parameters are sex-specific and necessary for certain decisions during blood transfusion. Senior clinicians should therefore make it a point of duty to tutor younger clinicians on the benefits and importance of this information because most of these request forms are filled by younger colleagues. Diagnosis or indications for the blood transfusion request were inadvertently missed in a significant number of the evaluated request forms perhaps due to the fact that a number of the patients present as emergencies requiring urgent transfusion before complete assessment, reviews by senior colleagues and diagnosis. This could be addressed by increasing manpower such that while others are attending to emergencies others are carrying out conclusive assessment to arrive at diagnosis. Clinicians should understand that quantity of blood required and urgency at which cross matching processes are done could be influenced by known and documented diagnosis. Most of the informations required on the blood transfusion request forms considered in this study indicated varying levels of incompleteness with special mention of dates and times where prefixes have become the norm among several clinicians in our environment. These prefixes include ASAP (As Soon As Possible) for dates and time with the others being, documenting date instead of time, and using terminologies like ‘now’, urgent, and very urgent as well as AM (Ante Meridiem) and PM (Post Meridiem) instead of documenting the actual time the cross-matched blood will be required. This affects prompt general medical laboratory and blood transfusion service delivery as related to turnaround timing and hence the provision of safe blood for transfusion as at when due. It also affects the laboratory audit and data collection as most often these prefixes are subject to individual interpretation.

Worthy of commendation is the complete documentation seen from the laboratory aspect of the initial requirement for blood transfusion processes. The laboratory number and blood grouping processes for the patients were all carried out and appropriately documented despite the deficiencies noticed from the failure of the clinicians to appropriately fill in the required information on the blood transfusion request forms. This might be linked to the laboratory personnels' dedication to duty and the understanding of how essential and life-saving the blood transfusion can be as well as the thin line between making the product available and fatalities like blood group incompatibility with haemolytic transfusion reactions due to blood group incompatibilities and hypovolaemia that could follow if delayed or mismatched. Clinicians should not take this dedication to duty for granted but should rather play their roles appropriately and completely in making available all information required even in emergencies or when overwhelmed by patient loads. This will contribute to a seamless, timely and effective blood transfusion compatibility process.

5. CONCLUSION AND RECOMMENDATION

Inappropriate and incomplete filling of laboratory request forms by clinicians is a recurrent problem with the capacity to affect outcomes of laboratory processes in general and blood transfusion compatibility workup in particular. While laboratory personnel strive to play their roles to the best of their ability, clinicians should also endeavour to play their part for better medical practice. Senior and more experience clinicians should educate their junior colleagues on importance of appropriate and complete information on request forms in general and transfusion request forms in particular. Health institutions should make an effort to establish laboratory quality management systems with robust monitoring mechanisms that will serve as a check for some of this preanalytic negligence. Institutionalization of electronic medical record systems where preceding information cannot be imputed without the former will go a long way toward mitigating this problem of incomplete filling of blood transfusion laboratory request forms. While hospital laboratories in settings like ours are still struggling with the challenge of electronic medical record systems, attitudinal change by clinicians will go a long way in minimizing this problem.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical approval was obtained from the Jos University Teaching Hospital Health Research Ethics Committee.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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