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Website: www.ajts.org
DOI: 10.4103/ajts.AJTS_135_17

Audit and education: Role in safe transfusion practice

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Abstract:

BACKGROUND: Auditing and education are the tools for improvement in the transfusion practices. Clinicians are not providing patient's demographic data and medical history to the blood bank that required transfusion. This missing information in blood request forms can lead to transfusion reactions to the patient. So we planned to analyse the blood request forms received at our blood bank and the impact of educational program for the clinicians.

METHODS: A total of 6894 blood request forms were received from the month of July 2014 to December 2014 at a blood bank in Amritsar, India. We evaluated for completeness of the blood request form in parameter columns like second identification (CR No. or Father/Husband Name), diagnosis, pre transfusion hematological parameters, quality and quantity of blood component required, history of previous transfusion and adverse transfusion reaction, urgency of transfusion, medical officer name and signature, phlebotomist name and signature etc. A series of CMEs on "Safe Transfusion Practices" were organized for clinicians and hospital staff from 1st August 2014 and improvement in clinicians' behavior was analysed.

RESULTS: A total of 60.83% requests were not filled completely during the study period. Of these 91.42% were in the month of July, which decreased to 48.76% in the month of December 2014 with a total improvement of 42.66%. Incomplete second identification (91.03%) and history of previous transfusion and adverse transfusion reactions (80.21%) were the commonest incomplete fields in the month of July 2014. In the month of December 2014, an improvement in incomplete second identification was observed (12.8%) however phlebotomist signature was still a major incomplete field (45.19%). A statistically significant (p value = 0.004, paired 't' test) improvement in completeness of forms was observed.

SUMMARY: Results of medical audit and using those as a basis for developing a highly targeted educational program, can improve the clinicians' approach towards transfusion practices.

Keywords:

Audit, education, request forms, safe transfusion

Introduction

Nowadays, transfusion medicine is a separate specialty that directs the transfusion services in hospitals.^[1] There is cooperating strategy required with treating clinicians to provide quality services for patients. The treating physician initiates the first contact with patients. They are responsible for accurately describing the patient's details

as follow: clinical condition, coexisting morbidities, and potential long-term need for transfusion therapy.^[2] This information provided through blood request form to the transfusion medicine services. Blood request form is the sign of final clinical decision to transfusion. Blood request forms provide information regarding patient's details, diagnosis, current hematological parameters, blood component requested, and previous transfusion history, etc. Physicians underestimate the importance of adequate completion of request forms, which results medical errors or delay in instituting appropriate treatment. The

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How to cite this article: Patidar GK, Kaur D. Audit and education: Role in safe transfusion practice. Asian J Transfus Sci 2018;12:141-5.

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Submission: 01-11-2017

Accepted: 08-06-2018

previous studies showed that missing information in request form for various laboratory and radiology testing cause delay in treatment process.^[3-7] Missing information in blood request form leads chances of error and transfusion reactions to the patient. Predetermined transfusion guidelines, pretransfusion approval, and transfusion audits are useful tools in the education of those ordering blood components. Current practice is to release the blood components on the demand of the ordering physician, without taking advice from transfusion medicine practitioners. Clinical audit is a management tool for the appraisal and justification of appropriateness and efficiency of transfusion therapy.^[8,9] Audit is an important part of the quality assurance program, which provides patient's information for improving transfusion medicine practice.^[8]

After auditing, the continuous education of the clinicians regarding the usefulness of completion of the request form and judicious use of blood component was helpful to improve transfusion services. Solomon *et al.* reported that auditing with feedback to physicians, a recurrent education program for hospital staff, introducing a request form requiring justification of component orders were reduced the significant drop of blood component usage.^[10] Gharehbaghian *et al.* also concluded that for improving transfusion, medicine knowledge of practicing physicians achieved by continuous medical education program.^[11]

In this study, we analyzed the blood requisition forms sent by the clinicians. Then, we analyzed the effect of education (CME) program on clinician's behavior toward transfusion practices.

Materials and Methods

This study was conducted at a largest blood bank in Amritsar, Punjab state in India. We supplied blood to around 100 hospitals in the city. We conducted this study over a period of 6 months from July to December 2014. This study used a pre-post design, in which incomplete

columns in blood request forms were assessed for a period before and after the intervention was introduced. Institutional Ethical Committee approved the study, and consent taken from clinicians and staff nurses at the time of Continuing Medical Education (CME) program.

For 1-month in July 2014, we only analyzed the incomplete fields in transfusion request form. Then, from August 2014, we introduce the CME program on "Safe Transfusion Practices" for clinicians and hospital staffs of 50 major hospitals, where maximum blood usage was from our blood bank. We organized 50 CMEs in a step-wise manner, average 2 CMEs in a week.

In this CME, we educate 150 clinicians and 500 hospital staff regarding the importance of complete blood request form, monitoring the patient during blood transfusion, and identify and management of transfusion reactions.

After the introduction of CMEs, we analyzed the trends in the reduction of the incomplete fields in the transfusion request forms.

During this study period, a total of 6894 blood request forms received from various hospitals. We evaluated them for completeness of various fields such as second

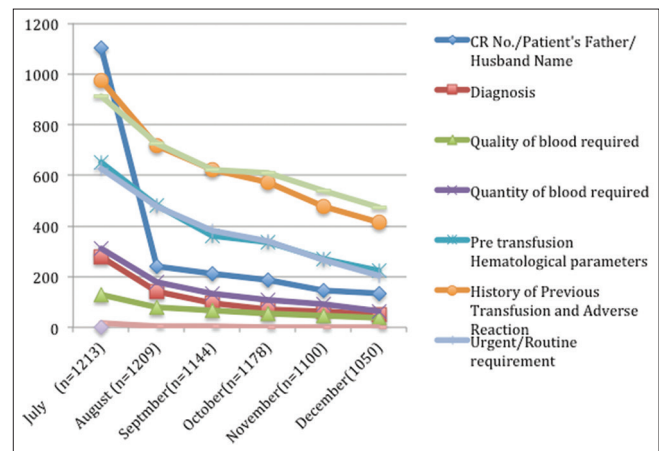


Figure 1: Changing trends incompleteness in transfusion request forms from July 2014 to December 2014

Table 1: Differences in incomplete transfusion request form in July 2014 and December 2014

	July (n=1213)	December (n=1050)	Difference (%)
CR No./Patient's Father/Husband Name	1104 (91.03%)	134 (12.8%)	78.23%
History of Previous Transfusion and Adverse Reaction	973 (80.21%)	413 (39.42%)	40.79%
Phlebotomist Name and signature	913 (75.27%)	474 (45.19%)	30.08%
Pre transfusion Hematological parameters	651 (53.67%)	224 (21.38%)	32.29%
Urgent/Routine requirement	624 (51.44%)	204 (19.45%)	31.99%
Quantity of blood required	312 (25.72%)	64 (6.19%)	19.53%
Diagnosis	278 (22.92%)	52 (5.02%)	17.9%
Quality of blood required	129 (10.63%)	37 (3.53%)	7.1%
Medical Officer Name and Signature	18 (1.48%)	1 (0.1%)	1.38%
Total	1109 (91.42%)	512 (48.76%)	42.66%

identification, diagnosis, pretransfusion hematological parameters, quality and quantity of blood component required, history of previous transfusion and adverse transfusion reaction, urgency of transfusion, medical officer name and signature, and phlebotomist name and signature.

Statistical analysis

The statistical analysis was done using the IBM SPSS Statistics for Window, Version 22.0, (IBM Corp Armonk, NY). All results were calculated as mean \pm standard deviation mean values were compared using the "paired *t*-test" and a $P < 0.05$ was considered statistically significant.

Results

A total of 6894 number of requisition received during the study period from July to December 2014. Out of this, total received requisition 4229 (61.34%) were incomplete. In this, maximum were in July 2014 (1109, 16.08% of the total received) while at least in December 2014 (512, 7.42% of the total received). There was a decreasing trend of incomplete requisitions from July 2014 to December 2014 as shown in Table 1 and Figure 1.

There was 42.66% overall improvement in completeness of request form which was statistically significant ($P = 0.004$ paired *t*-test).

On the basis of information regarding the history of previous transfusion and adverse transfusion reaction, a total of 108 antibody screening was performed using microcolumn gel technique, and anti-D was found in four cases, anti-C in two cases, and anti-S and anti-M each in one case.

Discussion

Blood request form is the most important communication medium through which clinicians enlighten the transfusion medicine specialist about patient's details as follows: clinical condition, coexisting morbidities, and potential long-term need for transfusion therapy. Many clinicians still not filled the request forms and not providing complete patient's information. Clinicians believed that blood sample is appropriate for the requirement of the blood without giving clinical details of the patient. Studies from different parts of the world in different laboratory services had shown deficits in filling of laboratory test request forms.^[3-7,10,11]

Oyedeji *et al.*^[5] found that only 1.3% of the 7,841 request forms reviewed were fully filled with patient's information. Patient's names, the referring physician's name, and gender were the most completed information

on the forms evaluated with 99.0%, 99.0%, and 90.3% completion, respectively. Patient's age gave in 68.0%, request date in 88.2%, and clinical notes/diagnosis in 65.9% of the requests. Patient's full address provided in only 5.6% of requests forms. Jain *et al.*^[12] and Jegede *et al.*^[13] also found that 19.8% and 18.8% blood request forms with incomplete patient's details in their blood bank, respectively.

Similarly, in our study in July 2014, the highest number of incomplete field found (91.42%), which varied from second identification (91.03%) to medical officer's name and signature (1.48%). Deb *et al.*^[14] did audit of blood request forms and they found that 56% forms did not mention blood group of patients and urgency of requirement. In our study, we also found that 51.44% forms not mentioned urgency of requirements.

For improvement of filling of this incomplete request forms, we started educating the clinicians and their hospital staffs through CMEs. Continuous education is the most established tool for increasing clinician's knowledge.^[15] Burton and Stephenson^[16] concluded that education of clinical colleagues required if pathologists are to manage the demand for the service.

For this first, we targeted the transfusion attending physicians and staff nurses. Salem-Schatz *et al.*^[17] found that educational strategies should target the transfusing attending physician. They found that attending physicians had lower knowledge scores than did residents. They also found that knowledge might vary among groups of physicians depending on their age such as younger physician more aware about transfusion-related science than older. It also depended on their working place such as physicians in teaching hospitals might be expected to be more knowledgeable than those in hospitals with less rigorous training components. Hence, in our study, we targeted the clinicians who were working in private hospitals where training components were less or almost nil.

Our CMEs targeted to the clinicians regarding filling the blood request forms and importance of each column in the request form. We taught them how incomplete request form unnecessary delay in issuing the blood components, and it can lead to severe transfusion reactions to the patients. Osegbe *et al.*^[18] performed a clinician education study for completion of request forms, and in this study, they found significant improvement ($P < 0.05$) in various fields such as age, hospital number (second identification number), clinicians name, ward, clinical diagnosis, and specimen type.

In our study, the most common incomplete column was second identification column; clinicians identified

the patient only by their name. There was no hospital registration number provided by them. American Association of Blood Banks standards suggested that patient blood sample tubes and blood request form must have bearing at least two unique patient identifiers for reducing this kind of errors.^[19] Hence, we also enforced second identification number in our blood request form as well as in blood samples. After enforcement of this and continuous education of clinicians and their staff, there were significant improvements of the filling of this column in blood request forms. However, still, there were 12.8% blood request forms were not having second identification.

The previous transfusion history and adverse transfusion reactions due to previous transfusion were the second-most-common incomplete column in blood request form in our study. There are chances of alloantibodies or autoantibodies formation in patient's serum, in case of previously transfusion.^[20] These antibodies can interfere with the cross-match testing in the blood bank and also cause hemolytic transfusion reactions.^[21] If the patient had minor transfusion reactions such as febrile transfusion reactions and allergic reactions, clinicians should mention this in request form, which help the transfusion medicine specialist for the selection of type of blood and blood component for next transfusion to prevent similar kinds of reactions in next transfusion. Deb *et al.*^[14] also found that 3.7% was not mentioned the indication of transfusion, 25.1% not mentioned the history of previous transfusion, and 37.38% not mentioned about pregnancy history in blood request forms. In our study, after implementation of CME, there was reduction in incompleteness in the filling the column by 39% from 81% before CME. Another advantage we observed that with the help of this information, we screened the patients for alloantibody, and we found anti-D in four cases, anti-C in two cases, and anti-S and anti-M each in one case in a total of 108-antibody screening test.

The next common incomplete column in our study was phlebotomist name and signature. The previous studies also found that incomplete information about requesting physician's name and contact number.^[6,22]

The pretransfusion hematological parameter was not provided in 53.67% of the request forms on preassessment. The reason was evaluated and it was found that the complete blood count of the patients was not done by the clinicians. They had sent blood request forms based only on their clinical evaluation. This kind of practice prone the patient's toward the transfusion reactions by transfusing not needed blood components. After implementation of the CME, it was reduced to 21.3%.

Quantity and quality of blood required, diagnosis of the patient, medical officer's name, and signature were also

major columns in the blood request form, which were incomplete on initial assessment and improved after implementation of the CME.

Miller *et al.*^[1] reviewed the evolving role of transfusion practitioners in the different countries, and they concluded that transfusion practitioners aimed to educate physicians and hospital staff, management of adverse reactions, and monitoring of transfusion practices.

In conclusion, prospective auditing of blood request forms and organization of CMEs regarding the transfusion services for the clinicians and staff nurses have major role in improvement for the clinical transfusion practices in the hospitals. Furthermore, the transfusion medicine practitioner's role should not be limited to the blood bank, while he should participate in the decisions making of transfusion requirements to the patients.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Miller K, Akers C, Davis AK, Wood E, Hennessy C, Bielby L. The evolving role of the transfusion practitioner. *Transfus Med Rev* 2015;29:138-44.
2. Alving B, Alcorn K. How to improve transfusion medicine. A treating physician's perspective. *Arch Pathol Lab Med* 1999;123:492-5.
3. Akintomide AO, Ikpeme AA, Ngaji AI, Ani NE, Udofia AT. An audit of the completion of radiology request forms and the request practice. *J Family Med Prim Care* 2015;4:328-30.
4. Schettini DA, Schettini AP, Sardinha JC, Ferreira LC, Vasques F, Xerez L. Assessment of completion of forms requesting skin biopsies. *An Bras Dermatol* 2012;87:115-8.
5. Oyedeji OA, Ogbenna AA, Iwuala SO. An audit of request forms submitted in a multidisciplinary diagnostic center in Lagos. *Pan Afr Med J* 2015;20:423.
6. Nutt L, Zemlin AE, Erasmus RT. Incomplete laboratory request forms: The extent and impact on critical results at a tertiary hospital in South Africa. *Ann Clin Biochem* 2008;45:463-6.
7. Zemlin AE, Nutt L, Burgess LJ, Eiman F, Erasmus RT. Potential for medical error: Incorrectly completed request forms for thyroid function tests limit pathologists' advice to clinicians. *S Afr Med J* 2009;99:668-71.
8. Tuckfield A, Haeusler MN, Grigg AP, Metz J. Reduction of inappropriate use of blood products by prospective monitoring of transfusion request forms. *Med J Aust* 1997;167:473-6.
9. Kumar A, Sharma S, Ingle N, Gangane N. An audit of blood bank services. *J Educ Health Promot* 2014;3:11.
10. Solomon RR, Clifford JS, Gutman SI. The use of laboratory intervention to stem the flow of fresh-frozen plasma. *Am J Clin Pathol* 1988;89:518-21.
11. Gharehbaghian A, Javadzadeh Shahshahani H, Attar M, Rahbari Bonab M, Mehran M, Tabrizi Namini M. Assessment of physicians knowledge in transfusion medicine, Iran, 2007. *Transfus Med* 2009;19:132-8.

12. Jain A, Kumari S, Marwaha N, Sharma RR. The role of comprehensive check at the blood bank reception on blood requisitions in detecting potential transfusion errors. *Indian J Hematol Blood Transfus* 2015;31:269-74.
13. Jegede F, Mbah HA, Dakata A, Gwarzo DH, Abdulrahman SA, Kuliya-Gwarzo A. Evaluating laboratory request forms submitted to haematology and blood transfusion departments at a hospital in Northwest Nigeria. *Afr J Lab Med* 2016;5:381.
14. Deb P, Swarup D, Singh MM. Audit of blood requisition. *Med J Armed Forces India* 2001;57:35-8.
15. Joubert J, Joubert S, Raubenheimer J, Louw V. The long-term effects of training interventions on transfusion practice: A follow-up audit of red cell concentrate utilisation at Kimberley hospital, South Africa. *Transfus Apher Sci* 2014;51:25-32.
16. Burton JL, Stephenson TJ. Are clinicians failing to supply adequate information when requesting a histopathological investigation? *J Clin Pathol* 2001;54:806-8.
17. Salem-Schatz SR, Avorn J, Soumerai SB. Influence of knowledge and attitudes on the quality of physicians' transfusion practice. *Med Care* 1993;31:868-78.
18. Osegbe ID, Afolabi O, Onyenekwu CP. The effectiveness of clinician education on the adequate completion of laboratory test request forms at a tertiary hospital. *Ann Med Health Sci Res* 2016;6:90-4.
19. Standards for Blood Banks and Transfusion Services. 30th ed. Bethesda MD: AABB; 2015.
20. Aygun B, Padmanabhan S, Paley C, Chandrasekaran V. Clinical significance of RBC alloantibodies and autoantibodies in sickle cell patients who received transfusions. *Transfusion* 2002;42:37-43.
21. Sheshadri V, Venkatesh KH. Does multiple transfusion history necessitate additional cross matching evaluation prior to subsequent transfusions? *J Anaesthesiol Clin Pharmacol* 2015;31:411-2.
22. Burnett L, Chesher D, Mudaliar Y. Improving the quality of information on pathology request forms. *Ann Clin Biochem* 2004;41:53-6.