

A survey of resident physicians' knowledge concerning transfusion medicine in Shiraz, Iran

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Abstract:

Objective: The knowledge of physicians concerning blood transfusion has a significant impact on the optimal use of blood and blood products. The aim was to survey their knowledge regarding this area and identify whether additional training is required. **Material and Methods:** This cross-sectional study was conducted on all 1st year resident physicians at Shiraz University of Medical Sciences, Iran in 2011. The questionnaire solicited information on demographic variables, knowledge regarding transfusion medicine, education and experience regarding blood transfusion. **Results:** The mean total knowledge score regarding transfusion medicine was 15.44 ± 3.3 (7–25) out of 29. Only about one-fourth (27.4%) replied correctly to over 60% of questions. The mean score of knowledge was higher among residents who stated that they received special training regarding blood transfusion in their medical courses ($P < 0.01$). Seventy-five percent of residents believed that they had received insufficient education and 97.8% believed that they need additional training. **Conclusion:** The results reflect the uncertainties among resident physicians regarding blood transfusion. It has been suggested that a special transfusion medicine educational program should be added to the medical education curriculum.

Key words:

Blood transfusion, education, knowledge, medical education, physician, transfusion medicine

Introduction

Blood transfusion is one of the most common procedures performed in hospitals.^[1] Physicians make the decision to prescribe blood and blood products. Knowledge of physicians regarding indications for transfusion and the amount of blood and blood products has an important impact on the optimal use of blood and blood products.^[2] Improvement in the appropriate use of blood and blood products is one of the main goals of blood transfusion centers. In spite of efforts to improve blood safety, some concerns still remain regarding the safety of blood products. Inappropriate transfusion of blood and blood products cause the waste of precious community resources, unnecessarily expose patients to transfusion risks, and reduce the availability of particular blood products for patients who need transfusion support.^[2,3] Some studies have demonstrated that the morbidity and mortality of patients is increased following blood transfusion.^[4-6] Therefore, knowledge of physicians toward blood transfusion is an extremely important issue.^[7] Some studies surveyed the knowledge of physicians regarding blood transfusion and showed that the basic knowledge of physicians must be improved.^[2,8-10] In Iran, medical students do not receive any specific training regarding transfusion medicine in medical schools and start residency program once they successfully pass the entrance exam. Given the importance of physician residents'

knowledge in the care of patients who need transfusion; we found it necessary to investigate the awareness level of 1st year resident physicians regarding transfusion medicine. The aim was to identify any deficiencies in the education of physician residents regarding this area and identify whether additional training is required. The results of this study will encourage medical universities to improve transfusion medicine education.

Materials and Methods

This cross-sectional study was conducted at Shiraz University of Medical Sciences, one of the leading medical universities in southern Iran in 2011.

One hundred and thirty-five 1st year resident physicians in every clinical subspecialty such as internal medicine, surgery, urology, neurosurgery, pediatrics, dermatology, community medicine, neurology, psychiatry, rehabilitation, anesthesiology, obstetrics, and pathology participated in this study. It is worth mentioning that all the participants had started their residency program 2 months prior to the commencement of this study. A self-devised questionnaire was used for data collection. The content validity of the questionnaire was determined by an expert panel. The reliability of the questionnaire was evaluated using kappa and intraclass correlation coefficient (ICC). ICC was between 0.85 and 0.96 and kappa

Access this article online

Website: www.ajts.org

DOI: 10.4103/0973-6247.137451

Quick Response Code:



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was between 0.88 and 1 for all variables. The questionnaire solicited information on demographic variables (age, sex, marital status, years of practice, year of medical practice and graduation from medical university, name of their medical university, and subspecialty); blood donation status (if they had donated blood before and how often they had donated); education regarding transfusion medicine during medical course if they had received any education, sufficiency of education, and any suggestions for improving physicians' knowledge regarding blood transfusion; experience regarding blood transfusion; required criteria for blood donation; indication for transfusion of packed red blood cell (RBC), platelet, and fresh frozen plasma (FFP); administration and adverse reaction of blood and blood products.

We calculated the mean score of awareness in each domain by dividing the total awareness score by the number of questions in each category. We surveyed the knowledge score according to prior experience of prescribing blood and blood products. One point was scored for every correct answer and 0 for any incorrect one. No partially correct marks were given. The maximum total knowledge score was 29. We invited all 1st year residents in every clinical subspecialty and distributed the questionnaire among them.

Ethics

The Institutional Ethics Review Committee of Blood Transfusion Organization and Shiraz Medical University approved the study protocol.

Statistics

Pearson correlation and the analysis of variance between groups test and *t*-test were used to analyze the data using the Statistical Package for Social Sciences (SPSS) software. *P*-value less than 0.05 was considered as significant.

Results

A total of 135 questionnaires were returned. The participants' mean age was 31.6 ± 5.53 years (range 25-60 years) and 59% of the participants were men. Furthermore, the participants' average experience in practice was 6.62 ± 4.84 (1-18) years and the percentage of residents with prior experience of prescribing blood and blood products was 86.4%. The average number of blood prescriptions during the previous month was 13.62 ± 59.13 (0-450) which accounts for 65.3% of residents had prescribed blood transfusion during that period. 69.7% of our participants stated that they received training about transfusion medicine in medical schools, but 75% of them believed that their training was insufficient. Moreover, only 33.1% of the respondents had experience of blood donations and the mean number of their blood donations was 1.84 ± 2.86 (0-15). The mean total awareness score regarding transfusion medicine was 15.44 ± 3.3 (7-25) out of 29. The results revealed that 25% of the respondents scored less than 13, 50% scored between 13 and 18, and 25% scored over 18. Only about one-fourth (27.4%) of respondents replied correctly to more than 60% of the questions. The average awareness score of the participants regarding transfusion medicine in each of the six domains is summarized in Table 1. It was found that the level of awareness amongst the residents was correlated with their subspecialty ($P < 0.05$). Anesthesiologists and internal medicine received the best test scores. Furthermore, the mean score of

knowledge in residents who thought that they had received enough education regarding transfusion medicine was not higher than those who thought that they had received insufficient training ($P > 0.05$). The mean score of knowledge regarding required criteria for blood donation was higher in residents who had a history of previous blood donation ($P < 0.05$). Moreover, the mean score of awareness did not correlate with the respondents' age ($r = 0.17$, $P = 0.18$) and to the number of years of their practice ($r = -0.11$, $P = 0.3$). The mean score of knowledge was higher in men ($r = 0.23$, $P = 0.02$). The mean score of knowledge did not differ in residents who had been prescribed blood before with those who had not ($P = 0.87$). The mean score of knowledge did not differ in residents who had recently been prescribed blood with those who had been prescribed in the past ($P = 0.35$). The mean score of knowledge was higher in residents who stated that they had received special training regarding blood transfusion during their medical courses ($P < 0.01$). 97.8% of respondent believed that they need additional education concerning blood transfusion. The suggested program aimed at improving their knowledge showed that 83.3% supported the idea of holding official seminars and 16.7% were in favor of receiving informative brochures.

Discussion

This study has highlighted a significant lack of knowledge among resident physicians concerning transfusion medicine. This lack of knowledge depicts failure throughout the medical undergraduate years which continues into postgraduate education. Such failure can lead to improper use of blood and blood products, more costs per patient, and the exposure of patients to infectious and noninfectious adverse consequences.^[2,8,11-14] Therefore, it is important for graduated medical students to have the ability to distinguish the type and the quantity of appropriate blood components in patients who really need it, and be aware of blood component substitutes and alternatives to blood transfusion.^[12] The results of our study was comparable with another study conducted in Iran by Gharehbaghian, *et al.*, which reported that 1,242 specialists had a lower level of knowledge regarding transfusion medicine than they had been expected and improvement in physicians' knowledge led to a decrease in unnecessary transfusion and improves blood sufficiency for patients.^[2] Likewise, in their study, Salem-Schatz, *et al.*, reported

Table 1: Mean knowledge score of participants in different domains

Knowledge score domain	Number of items	Mean knowledge score* + SD
Regarding transfusion medicine	37	0.5327±0.11379
Required criteria for blood donation	3	0.5333±0.21433
Indications of use of packed red blood cells (RBC)	3	0.4323±0.22874
Indications of the use of platelet	6	0.4805±0.17946
Indications of the use of fresh frozen plasma (FFP)	6	0.4074±0.24993
How to administer blood and blood products	5	0.6222±0.23008
Potential adverse reactions	6	0.4691±0.22691

*Mean knowledge score = Sum of knowledge divided to number of items

that only about one-third of physicians had enough knowledge about the correct use of blood and blood products.^[10] Another similar study conducted by Rock, *et al.*, identified the poor basic knowledge of physicians regarding blood transfusion.^[8] These findings are in line with the results of our study which indicate that 75% of the residents believed that they received insufficient education regarding transfusion medicine, and as a result of this felt less competent in transfusion medicine, and were aware of their weaknesses in the care of patients. The findings of this study also revealed that 98.5% of residents believed that there is a need for more education concerning transfusion medicine. This finding was similar to other studies in which physicians stated that they require more training regarding transfusion medicine.^[2,8,9,15] Indeed, a change does not occur until the necessity for change is recognized.^[8,16] It seems that the establishment of specific transfusion medicine training program would ultimately improve physicians' knowledge towards transfusion medicine.^[8] In Iran, medical universities do not have any special training courses concerning transfusion medicine. In fact, a study conducted by Salimi, *et al.*, emphasized on the poor knowledge of physicians regarding transfusion medicine because of not having received special training on transfusion medicine.^[17] Mitchell, *et al.*, also confirmed that physicians require more training regarding blood transfusion.^[9] With the importance of knowledge about transfusion medicine, it seems that the establishment of specific transfusion medicine training program can improve physicians' knowledge toward transfusion medicine. It is obvious that designing transfusion algorithms and educational programs can be effective in improving physicians' knowledge regarding the appropriate use of blood and blood products.^[18-20]

In this study, the physicians' general awareness was not correlated to the number of years in practice; but in another study conducted by Gharehbaghian, *et al.*, in Iran, physicians' knowledge significantly decreased with increasing years in practice.^[2]

One of the positive points of this study was the participation of all resident physicians in every field, so it may represent the knowledge of our residents regarding transfusion medicine.

Our study has some limitations. The results revealed only the perception of residents regarding blood transfusion rather than their actual practice in this regard; hence, the findings will naturally be limited to this particular variety.

Conclusion

The results reflect the uncertainties among resident physicians regarding blood transfusion and highlight the need for establishment of specific transfusion medicine training programs in medical schools.

Acknowledgements

We thank the education of residents unit of Shiraz medical University for their generous help with data collection and holding the seminar. In addition, we would like to thank Azade Mosallai for entering the data and Fariba Farhadi for typing the manuscript. We thank Dr. Zahra Bagheri and Dr. Peyman Jafari for the data analysis, and Alison Imanieh and Dr. Mosleh Shirazi for editing the article in English.

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Cite this article as: Kasraian L, Tavassoli A. A survey of resident physicians' knowledge concerning transfusion medicine in Shiraz, Iran. *Asian J Transfus Sci* 2014;8:118-20.

Source of Support: Nil, **Conflicting Interest:** None declared.