

# Study of Impact of Training Program on Rational Use of Blood in a Tertiary Hospital

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## ABSTRACT

### BACKGROUND

Blood is a scarce resource. Clinicians who prescribe blood should have proper knowledge of blood transfusion so that this precious material can be utilized rationally. Lack of knowledge regarding transfusion medicine among clinicians is possibly the major obstacle in making transfusion practices more consistent. Education and audit are significant in changing transfusion practices. We wanted to assess the knowledge of blood transfusion among the clinicians, impart knowledge about blood transfusion and assess the effectiveness of the training program.

### METHODS

A total of 48 clinicians from different blood user departments were enrolled for a training program on rational use of blood. The participants were given questionnaires to be filled up before the start of the training. After the interactive training, they were made to fill up the questionnaires again for post training assessment and scores were recorded.

### RESULTS

The score in the pre training group was 533 (55.52%) and the score in the post training group was 765 (79.68%) and the difference is highly significant ( $P < 0.001$ ).

### CONCLUSIONS

The study concluded that the training program was successful in improving the knowledge about blood transfusion. We recommend conducting such training programs at regular intervals in the future.

### KEYWORDS

Blood Transfusion, Clinician, Training

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*DOI: 10.18410/jebmh/2020/300*

*How to Cite This Article:*  
*Khoyumthem P, Khiangte V, Rajesh*  
*Singh R, et al. Study of impact of training*  
*program on rational use of blood in a*  
*tertiary hospital. J. Evid. Based Med.*  
*Healthc. 2020; 7(29), 1420-1423. DOI:*  
*10.18410/jebmh/2020/300*

*Submission 14-05-2020,*  
*Peer Review 20-05-2020,*  
*Acceptance 18-06-2020,*  
*Published 20-07-2020.*

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## BACKGROUND

Blood transfusion is an essential support of health care and is lifesaving in many cases, but the safety and availability of blood is not always assured. Although most of the errors that occur in transfusion medicine do not cause severe consequences for the patient, such events are not rare and most of the fatal reactions are attributed to human error.<sup>1</sup> Majority of the errors occur in clinical wards.<sup>2</sup> Mark Friedman has stated that lack of knowledge regarding transfusion medicine among clinicians is possibly the major obstacle in making transfusion practices more consistent.<sup>3</sup> Although hospital transfusion committee makes policies on blood transfusion, education and audit are significant in changing transfusion practices.<sup>4</sup>

Organizing training programme on rational use of blood for the clinicians in two batches, we conducted a study during the training programme to assess the efficacy of the training. Thus, we aimed to assess the knowledge of clinicians on blood transfusion and to impart knowledge regarding various aspects of blood transfusion. We also tried to assess the impact of the training on their knowledge.

## METHODS

The study was a cross-sectional prospective one conducted in the Department of transfusion Medicine in a Tertiary care centre at Imphal, Manipur, India after getting approval from the Institutional Ethics Committee. A training program was conducted for the clinicians, on rational use of blood. It was held in the month of November, 2019 and conducted in two batches. Forty-eight clinicians participated in the training. They were from the departments of Medicine, Surgery, Paediatrics, E.N.T, Anaesthesiology, Obstetrics and Gynaecology, Radiotherapy, Nephrology, Urology, Orthopaedics and Emergency department. It was conducted by the head of department of Transfusion Medicine and the medical officers. The areas covered during the training were bedside issues on blood transfusion, blood component therapy, transfusion reactions and their management etc. Questionnaires were distributed before the training and the participants filled them up. The participants were told not to write their names or departments. The training program started after all the questionnaires were filled up and submitted. Then the faculty conducted the lectures on various topics such as bedside issues, component therapy, transfusion reaction etc. The lectures were followed by an interactive session during which the participants were encouraged to ask questions regarding blood transfusion. After the training, questionnaires with the same questions were made to be filled up by the participants in order to assess the effectiveness of the training. The questions were all multiple-choice questions. They were as follows-

- 1) Harmful effect of warming blood to temperature  $>42^{\circ}\text{C}$ ?
- 2) Re- issue is not possible if the temperature of a transported PRBC falls outside.

- 3) If a blood unit has been spiked/entered for transfusion, then it must be infused within how many minutes/hours?
- 4) Which solutions can be administered with blood components through the same tubing?
- 5) When should vital signs (temperature, B.P., pulse rate, respiratory rate, oxygen saturation) of the patient be recorded in relation to blood transfusion?
- 6) How frequently should Blood Transfusion set be changed?
- 7) Name the transfusion reaction in which the administration of the component may be routinely resumed after prompt treatment.
- 8) Before blood transfusion, the blood unit should be carefully examined for.
- 9) Solutions containing dextrose may cause red cells.
- 10) The following infections can be transmitted by blood transfusion.
- 11) After issue of blood component from the blood bank, transfusion should be started within.
- 12) Blood transfusion is usually needed when blood loss is
- 13) A unit of PRBC will increase the Hb by.
- 14) In massive blood transfusion RBC, FFP, platelets should be transfused ideally in the ratio.
- 15) Contraindication to platelet transfusion.
- 16) Cryoprecipitate transfusion is necessary to keep fibrinogen level above.
- 17) When is blood warming needed.
- 18) Thawed FFP, if stored at  $2-4^{\circ}\text{C}$ , should be transfused within.
- 19) FFP is indicated in.
- 20) Before FFP transfusion, the following laboratory parameters should be checked.

## RESULTS

All the enrolled participants completed the study protocol. There was a total of 20 questions. One mark was given for each correct answer. No mark was given for wrong answer or unmarked answer. For each question, the total number of correct answers from all the 48 participants were added together. In the pre- training group, the number of correct responses was highest for question no 8 (no. of correct response was 47). The question which received the least no. of correct response was no. 2 (the no. of correct response was 7). In the pre-training group, when all the correct answers for all the 20 questions were again added together, we got 533. The percentage of correct answers for all the questions in the pre-training group was 55.52% which is shown in Table 1.

In the post training group, the question nos. 4 and 11 got the highest no. of correct responses (48 correct answers) and the question which got the least no. of correct answers was question no.2 (16 correct answers).When all the correct answers were added up together in the post

training group, we got 765. Thus, the percentage of correct responses in the post training group was 79.68%.

When we compared the two groups by using paired t-test we got P value <0.0001 which suggest highly significant differences.

| Question No. | Pre-Training No. of Correct Responses | Post-Training No. of Correct Responses |
|--------------|---------------------------------------|--|
| 1            | 34 (70.83%)                           | 42 (87.50%)                            |
| 2            | 7 (14.58%)                            | 16 (33.33%)                            |
| 3            | 38 (79.16%)                           | 45 (93.75%)                            |
| 4            | 36 (75%)                              | 48 (100%)                              |
| 5            | 34 (70.83%)                           | 46 (95.83%)                            |
| 6            | 12 (25%)                              | 28 (58.33%)                            |
| 7            | 12 (25%)                              | 29 (60.41%)                            |
| 8            | 47 (97.91%)                           | 47 (97.91%)                            |
| 9            | 22 (45.83%)                           | 31 (62.50%)                            |
| 10           | 39 (81.25%)                           | 45 (93.78%)                            |
| 11           | 32 (66.66%)                           | 48 (100%)                              |
| 12           | 24 (50%)                              | 28 (58.3%)                             |
| 13           | 31 (62.50%)                           | 44 (91.6%)                             |
| 14           | 28 (58.33%)                           | 46 (95.83%)                            |
| 15           | 13 (27.08%)                           | 28 (58.33%)                            |
| 16           | 21 (43.75%)                           | 39 (81.25%)                            |
| 17           | 22 (45.83%)                           | 41 (85.41%)                            |
| 18           | 12 (25%)                              | 22 (45.83%)                            |
| 19           | 46 (95.83%)                           | 46 (95.83%)                            |
| 20           | 23 (47.91%)                           | 46 (95.83%)                            |
| Total        | 533 (55.52%)*                         | 765 (79.68%)*                          |

**Table 1. Distribution of Correct Responses in Pre- and Post-Training**

\*P value <0.0001

**DISCUSSION**

Erbil F et al conducted a descriptive study to identify blood transfusion practice and knowledge of 100 nurses.<sup>5</sup> The total score was 100 and none of the nurses scored 100 and only few scored more than 50. A study from Iran assessed the knowledge of health workers about proper methods of blood transfusion and how to promote their knowledge for proper performance.<sup>6</sup> The study showed that 26.2% of health care workers had low level knowledge, 22.1% moderate, and 51.6% acceptable knowledge. Aslani et al also investigated average knowledge of blood and its components among nurses.<sup>7</sup> Bedside administration issues are an important part of blood transfusion.

Saillour-Glenis F et al found poor knowledge and practice among nurses in France.<sup>8</sup> Hijji et al showed that the majority of the nurses in their study lacked knowledge pertaining to proper patient identification.<sup>9</sup> Kaur P et al conducted a study to assess the knowledge and awareness of 25 fresh bachelor of medicine and bachelor of surgery graduates.<sup>10</sup> The participants were given a pre assessment questionnaire followed by interactive training and post training re assessment. 36% of the participants were aware of the course of action to be taken if a unit is not transfused. In the post assessment, 96% of the participants gave the correct answer. In the question regarding documentation of transfusion in the patient record, percentage of correct response increased from 16% in the pre-assessment group to 56% in the post assessment group An observational study in Uganda concluded that the poor blood transfusion practice is likely to play a role in the morbidity and mortality of patients who receive a blood transfusion.<sup>11</sup> On the other hand, a Portuguese study showed that the nurses have a

good knowledge of blood transfusion, with 97.4% of the nurses obtaining 50% or more correct answers on the pre-assessment questionnaire.<sup>12</sup> A French study recorded a rate of correct answers from 14% to 89%, when they conducted a study to assess the knowledge in blood transfusion among medical staff.<sup>13</sup> Our study recorded the number of correct response for each question. In the pre-training group, the total number of correct answers was 533 (55.52%) and the total number of correct answers in the post training group was 765 (79.68%). Using a paired t-test, we calculated the P value and was found to be<0.0001 which is statistically extremely significant.

**Limitations**

- 1) As the training programme was held once a year, cumulative few years study would have been more appropriate on the outcome.
- 2) Further studies involving participants other than doctors like nurses and paramedical staffs are required to give an impact to proper health delivery.

**CONCLUSIONS**

In our study there was a significant difference in the knowledge of blood transfusion among the 48 participating clinicians before and after the training program. Therefore, we conclude that such trainings are very effective in bringing about awareness about blood transfusion. Awareness among the clinicians is a must to promote rational use of blood, a scarce resource. We recommend such type of regular interactive training program.

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