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Original Research Article

Vital Awareness: Blood Donation and Transfusion Safety

Fifi Darling Evana, Saranyabai*, Ramamoorthy Vedachalam, Prakashiny Sinnarajah

Department of Pathology, ACS Medical College and Hospital, Chennai, Thiruvallur, TamilNadu

Correspondence: Dr. Saranyabai* (ever8472@gmail.com)

ABSTRACT

Background: To determine the awareness and knowledge of blood donation and transfusion reactions among various departments in our tertiary care centre.

Material and methods: The cross-sectional study, conducted at ACS Medical College and Hospital in Chennai from March to May 2024, focused on 20 departments. Researchers distributed a pre-tested, self-structured e-questionnaire to the participants, who submitted their responses via email to a designated account.

Results: Out of the 20 departments surveyed, 64% were Faculty, 19% Postgraduate, and 17% were Interns. A significant majority, comprising 64% faculty, reported being aware of voluntary blood donation and transfusion reactions. However, despite the awareness and access to information, only a small fraction of the participants, knew about the right period of blood donation and transfusion reactions.

Conclusion: This study infers that knowledge and awareness of blood donation and transfusion reactions were relatively higher among faculty in department of surgery, obstetrics and pathology and least among psychiatry, anatomy and forensic medicine. Based on these findings, the study recommends organising regular talks and interactive sessions as essential measures to bridge the gap in knowledge, identify and dispel misconceptions, and motivate individuals for regular discussions based on blood donation and transfusion reactions. These initiatives aim to enhance awareness, clarify any misunderstandings, and foster a proper knowledge about blood donation and transfusion reactions among the patients in time of need like mass destruction like accidents and natural calamities.

Keywords: Blood Donation, Blood Transfusion, Transfusion Reaction, Blood, Awareness, Blood Transfusion Reaction.

INTRODUCTION

Blood donation awareness is crucial for ensuring an adequate and safe blood supply to meet the needs of patients in hospitals and healthcare facilities. Blood transfusion reactions can occur when receiving blood that is incompatible with the recipient's blood type or due to other factors. It's important for healthcare providers to closely monitor patients during and after transfusion to detect and manage any adverse reactions promptly. Pre-transfusion compatibility testing, careful donor screening, and adherence to transfusion protocols can help minimize the risk of transfusion reactions in time of mass destructions.[1]

MATERIAL AND METHODS

Study design and setting:

A cross-sectional study was undertaken at ACS Medical College and Hospital in Chennai over a three-month period spanning from March to May 2024. The study aimed to investigate specific departments within the institution during this timeframe.

Study population:

372 people consisting of faculty, postgraduate and interns from various departments in ACS Medical College and Hospital.

Inclusion criteria

The study included consenting faculty, postgraduate and interns from various departments at ACS Medical College and Hospital.

Exclusion criteria

- People who disinclined to participate.
- MBBS students.
- People from other college.

Data collection

The participants were provided with information about the objectives of the study prior to their involvement.
Data collection was conducted using a questionnaire, which had undergone pretesting to ensure its reliability.

Responses were gathered via Google Forms and accessed through a dedicated email address. Subsequently, the collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 18.

RESULTS

In the study, a total of 372 people from various departments participated, comprising 64% faculty, 19% postgraduate and 17% interns (Figure 1).

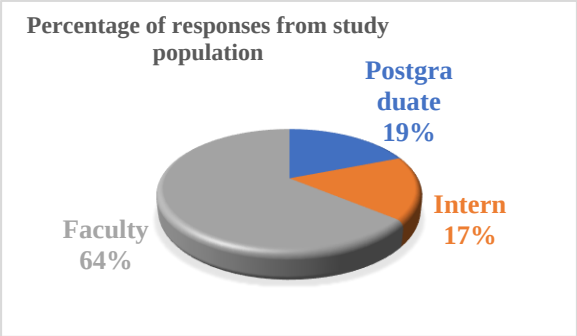

Figure-1: Represents percentage of response from study population in a pie chart.

Responses were collected through Google Forms from 20 different departments (Figure 2), covering pre-clinical, para-clinical and clinical departments in a institution. The purpose of these questionnaires was to gather comprehensive feedback on blood donation and transfusion reaction awareness from each department.

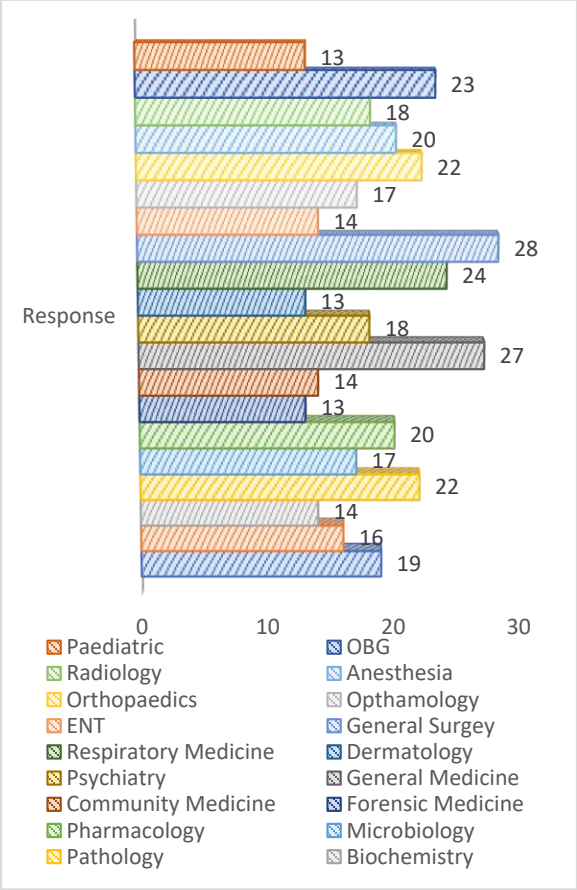

Figure-2: Represents the response from each department in a bar chart form.

The Departments were divided into phases according to national medical council's guidelines update on 12th June 2023 (Table 1)[2] This reorganization was done to compare the blood donation and transfusion reaction awareness between phase 1 and 2 with phase 3 part 1 and part 2.

Table-1: Phases according to National Medical Council.

PHASE 1	**PHASE** 2	**PHASE** 3 part 1	**PHASE** 3 part ll
Anatomy	Pathology	Forensic Medicine	General Medicine Psychiatry Dermatology Respiratory Medicine
Physiology	Pharmacology	Community Medicine	General Surgery ENT Ophthalmology Orthopaedics Anaesthesia Radiology
Biochemistry	Microbiology		Obstetrics and Gynaecology
			Paediatrics

Table-2 Presents the responses of the study population to questions regarding their knowledge about blood donation and transfusion reaction.

Table-2: Knowledge regarding blood transfusions and transfusion reaction.

Question	Phase 1 & 2 correct response (number)	Phase 1 & 2 correct response (in %)	Phase 3 correct response (number)	Phase 3 correct response (in %)
Which age group is eligible to donate blood?	98/108	90%	201/264	76%
Above which weight people are eligible to donate blood(350 ml)?	53/108	49%	212/264	80%
People who just had tattoo/ piercing can donate blood after	31/108	28%	131/264	49%
Haemoglobin level of_____ _is required to donate blood.	45/108	41%	188/264	71%
Donation interval for whole blood donation	62/108	57%	221/264	83%
Blood pressure of _____ _ is required for blood donation.	33/108	30%	193/264	73%
Blood donation is not acceptable	59/108	54%	198/264	75%

for which women				
Blood donation is not acceptable for diabetic patients who _____	84/108	77%	257/264	97%
Blood donation is not acceptable for which patients	61/108	56%	173/264	65%
Blood donation is acceptable for patients with (thyroid disorders)	69/108	63%	195/264	73%
Blood donation is acceptable for patients with Hepatitis	77/108	71%	208/264	78%
Blood donation is not acceptable for people with (infection)	53/108	49%	154/264	58%
After 7days of last ketoconazole dose blood can be donated if person is well	92/108	85%	232/264	87%
When suspecting haemolytic transfusion reaction what should be done?	79/108	73%	199/264	75%
Blood bag after transfusion reaction must be	83/108	76%	262/264	99%
A unit of whole blood is approx	41/108	37%	173/264	65%
TOTAL	1020/1728	59%	3197/4224	75%

DISCUSSION

Blood is essential for sustaining life. Its primary functions, include transport of oxygen and nutrients to cells while removing waste products like carbon dioxide. The combination of cellular components, such as red and white blood cells, along with plasma, forms this vital fluid tissue. The heart's pumping action ensures that blood circulates throughout the body, maintaining homeostasis and supporting various bodily functions. The rapid consequences of interrupted blood flow underscore its critical role in sustaining life.[3]

Blood transfusion is a crucial medical intervention used to replenish blood lost due to various reasons such as injury, surgery, or certain medical conditions. These transfusions often involve whole blood or specific blood components like red blood cells, platelets, or plasma, depending on the patient's needs. Blood banks play a vital role in collecting, testing, and storing donated blood to ensure its safety and compatibility for transfusion. Healthcare providers carefully monitor the transfusion process to minimize risks and ensure the patient receives the necessary support to recover effectively.[4,5]

This study was conducted to determine the awareness and knowledge of blood donation and transfusion reaction among various departments in our medical college in Chennai.

Study showed phase 3 people had more awareness of blood transfusion and transfusion reactions compared to phase 2 and phase 1 people. As phase 3 people deal more with patients and blood transfusion they had more knowledge regarding the above mentioned subject.

Regular organization of discussions, seminars and conferences can help in raising awareness. Knowledge regarding blood transfusion and transfusion reactions is much needed during mass destruction like accidents and natural calamities (earthquake, tornado, hail and etc.).[6]

The results of our cross-sectional study on blood transfusion and transfusion reaction awareness indicate that there is limited conclusive evidence at this stage. This study was conducted with a small sample size, which may not fully represent the broader population. Therefore, further research and larger-scale studies are warranted to provide more definitive insights into this important issue which may be helpful in disaster outbreaks. These future studies could explore a wider range of participants, employ more robust methodologies, and examine additional factors that may influence awareness and understanding of blood transfusion and transfusion reactions. By building upon the findings of this pilot study, we can better inform transfusion practices and enhance patient safety in healthcare settings.[7,8,9]

Awareness about blood donation can be done by:

- **Importance of Blood Donation**: Educate people about the significance of blood donation in saving lives. Highlight how donated blood is used in emergencies, surgeries, treatments for various medical conditions, and for patients with chronic illnesses.
- **Regular Donations**: Emphasize the need for regular blood donations to maintain an adequate blood supply. Encourage individuals to donate blood at least once or twice a year, if possible.
- **Safety and Hygiene**: Assure potential donors that blood donation is a safe and hygienic process. Explain the screening procedures and measures taken to ensure the safety of both donors and recipients.
- **Types of Blood Donation**: Inform people about the different types of blood donation, including whole blood donation, platelet donation, and plasma donation. Encourage them to choose the type that best fits their preferences and eligibility.
- **Donor Eligibility**: Provide information about the eligibility criteria for blood donation, including age, weight, health conditions, and lifestyle factors. Encourage individuals to check their eligibility before donating blood.[10,11,12]
- **Myths and Facts**: Address common myths and misconceptions about blood donation, such as the belief that donating blood is harmful to health or that certain groups of people cannot donate. Provide factual information to dispel these myths.
- **Community Outreach**: Organize blood donation drives and community outreach programs to reach a wider audience. Partner with local organizations, schools, businesses, and religious institutions to raise awareness about blood donation.
- **Social Media Campaigns**: Use social media platforms to share information about blood donation, success stories of recipients, and upcoming donation events. Encourage people to share their own experiences and spread the word to their networks.
- **Incentives and Recognition**: Offer incentives or recognition programs to encourage blood donation, such as free T-shirts, gift cards, or public acknowledgment of donors' contributions.
- **Volunteer Opportunities**: Invite individuals to volunteer with blood donation organizations or participate in blood drives as volunteers. This can help them feel more connected to the cause and motivated to support ongoing efforts.[13,14,15]

  By raising awareness about the importance of blood donation and addressing any concerns or misconceptions, we can inspire more people to become regular blood donors and ultimately save more lives.

Overview of blood transfusion reactions:

- **Acute Hemolytic Reaction**: This is a severe and potentially life-threatening reaction that occurs when the recipient's immune system attacks the donor blood cells. It can result from ABO incompatibility (mismatch between donor and recipient blood types) or from other factors such as antibodies in the recipient's blood. Symptoms include fever, chills, back pain, nausea, vomiting, chest pain, difficulty breathing, and dark urine.
- **Febrile Non-Hemolytic Reaction**: This type of reaction is characterized by fever and chills without evidence of hemolysis. It is usually caused by the recipient's immune response to donor white blood cells or platelets. Although not life-threatening, it can cause discomfort and may require medical intervention.
- **Allergic Reaction**: Some recipients may experience mild to severe allergic reactions to components in the donor blood, such as plasma proteins or preservatives.

Symptoms include itching, hives, rash, wheezing, difficulty breathing, and anaphylaxis in severe cases.

- **Transfusion-Related Acute Lung Injury (TRALI)**: TRALI is a rare but serious complication characterized by acute respiratory distress and pulmonary edema occurring within 6 hours of transfusion. It is believed to be caused by an immune response to donor antibodies present in the blood products.[16,17,18]
- **Transfusion-Associated Circulatory Overload (TACO)**: TACO occurs when the recipient receives blood or blood products too quickly, leading to fluid overload and heart failure. Symptoms include shortness of breath, cough, chest discomfort, and elevated blood pressure.
- **Delayed Hemolytic Reaction**: This type of reaction can occur days to weeks after transfusion when the recipient's immune system produces antibodies against donor red blood cells. Symptoms may include anemia, jaundice, and hemoglobinuria.
- I**nfectious Complications**: Although rare due to stringent screening protocols, transfusion-transmitted infections can occur if the donor blood is contaminated with pathogens such as bacteria, viruses, or parasites.[19,20,21]

CONCLUSIONS

Based on the study's findings, it is inferred that faculty members in the Surgery, Orthopedic and Pathology department demonstrated relatively higher levels of knowledge and awareness regarding blood donation and transfusion reactions whereas Psychiatry, Forensic medicine, Physiology and Dermatology compared to other departments had less awareness regarding the above mentioned topic. Overall comparison showed that phase 3 (75%) had more awareness when compared to phase 1 and phase 2(59%). As a result, the study recommends the implementation of regular talks and interactive sessions to address the observed knowledge gaps, dispel misconceptions, and motivate individuals to engage in discussions related to blood donation and transfusion reactions. These initiatives are aimed at enhancing awareness, clarifying misunderstandings, and fostering a comprehensive understanding of blood donation practices and the identification of transfusion reactions among patients. By organizing such activities regularly, healthcare professionals and students alike can stay updated on best practices, contribute to improving patient care, and promote a culture of safety and informed decision-making in blood transfusion procedures.

This study was conducted with a small sample size, which may not fully represent the broader population. Therefore, further research and larger-scale studies are warranted to provide more definitive insights into this important issue. These future studies could explore a wider range of participants, employ more robust methodologies, and examine additional factors that may influence awareness and understanding of blood transfusion and transfusion reactions. By building upon the findings of this study, we can better inform transfusion practices and enhance patient safety in healthcare settings. [22,23]

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