

Original article

HAEMOVIGILANCE EFFECT AND ITS UTILITY IN QUALITY MANAGEMENT TO PREVENT BLOOD TRANSFUSION REACTION

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ABSTRACT

INTRODUCTION: Haemovigilance is defined as a set of surveillance procedures covering whole transfusion chain from the collection of blood and its components to the follow up of its recipients, intended to collect and access information on unexpected or undesirable effects resulting from the therapeutic use of labile blood products, and to prevent their occurrence and recurrence.(1) **AIMS AND OBJECTIVES:** An effective effort towards the study of haemovigilance programme by evaluating the different adverse reactions occurring due to blood transfusion in patient receiving regular or temporary blood transfusion. The ultimate goal of a haemovigilance system is to improve the safety of blood transfusion. **METHODS & MATERIALS:** The current study was done at Blood bank AMC MET Medical College & LG Hospital, Ahmedabad. All the adverse reactions related to transfusion of blood components between April-2014 to March-2016 issued were studied. **RESULT:** In this study, total 17264 blood component (PCV, PRC, FFP, CRYO) were issued. From total 20 BTR, 18 BTR due to PCV, and 02 BTR due to PRC. In which 08 patients have febrile reaction, 07 patients have allergic reaction, 02 patients have non TRALI associated dyspnea and 01 patient has uneasiness-giddiness due to the PCV. 02 patients have allergic reaction which occurred due to PRC. **CONCLUSION:** Haemovigilance is an essential component of quality management in a blood system and is needed for the continual enhancement of quality and safety of blood products and transfusion process by monitoring and safeguarding the adverse events associated with the use of blood products.

Key words: HAEMOVIGILANCE , BLOOD TRANSFUSION REACTION,prevention

INTRODUCTION:

- Haemovigilance – Haema: Blood

Vigilance: watchful

- **“watchful and safe blood transfusion”**
- An adverse event is any untoward occurrence in the blood transfusion chain that might lead to death or life threatening, disabling or incapacitating conditions for donors and/or patients or which results in, or prolongs, hospitalization or morbidity and mortality(2).
- Haemovigilance is an important part of the quality system for blood transfusion. It implies methods for identify errors, adverse event and reactions including alert systems, investigations of complaints, traceability systems, notifications systems and audits of practice(3).

Classification of blood transfusion reactions (6)

❖ IMMEDIATE Transfusion Reaction

1. **Acute Hemolytic reaction:** Hemolytic reaction occurs when the recipient serum contains antibodies directed against the corresponding antigen found on donor red blood cells. This can be A, B, O incompatibility related to different blood group antigen.
2. **Allergic reaction:** Allergic reaction to plasma proteins can range from complaints of hives and itching to anaphylaxis. Such reactions may occur in up to 1 in 200 transfusions of RBCs and 1 in 30 transfusions of platelets.

3. **Febrile non hemolytic reaction:** It is caused by patient antibody directed against antigens presents on transfused lymphocytes or granulocytes. The Risk for febrile reaction is 1 in 1000- 10000. Symptoms usually consist of chills and temperature rise >1 degree C.
4. **Transfusion related acute lung injury (TRALI):** TRALI is caused by most often when donor plasma contains HLA or leukocytes specific antibodies. It leads to sudden respiratory distress from pulmonary edema, typically within 6 hours of transfusion. TRALI most often occur with administration of blood products with plasma, such as FFP.
5. **Anaphylactic reaction:** IgA deficient recipient in whom IgA antibodies react with IgA in donor plasma, leading to activation of complement formation of anaphylotoxin (C3a, C5a). Sign and symptoms produce acute hypotension, shock and dyspnoea after transfusion of a few drop of blood.
6. **Bacterial contamination of donor unit**
7. **Volume overload**

❖ **DELAYED TRANSFUSION REACTION**

1. **Delayed hemolytic transfusion reaction:** This is a reaction occurring several days or weeks after transfusion. This occurs in individual who have been sensitized to a red cell antigen by a previous transfusion or pregnancy so that the antibody is present in low titre. On re-exposure there is a secondary IgG immune response and mainly extra-vascular hemolysis. Symptoms produce like fever, mild jaundice, increased s.bilirubin, anemia.
2. **Transfusion of Infections:** like Hepatitis A, B, C, virus, HIV, Syphilis, Malarial Parasite.
3. **Iron Over load:**
4. **Post Transfusion Purpura:**
5. **Graft vs. host disease:**

Aims and Objectives

- An effective effort toward the study of haemovigilance programme by evaluating the different adverse reactions occurring due to blood transfusion in patient receiving regular or temporary blood transfusion.
- The ultimate goal of a haemovigilance system is to improve the safety of blood transfusion.

Material and Method

- The current study was done at Blood bank AMC MET Medical College & LG Hospital, Ahmedabad.
- All the adverse reactions related to transfusion of blood component between April-2014 to March-2016 issued were studied.

Pre-transfusion check: Clerical check (5)

Patient's name and identification number

- ABO and Rh Grouping
- Cross-matching (Compatibility test on microscopy and GEL card method).
- Technical check during issue
- Near expiry date bags should not be issued to critical patients who are more pretend to have reactions.
- During transportation of blood bag - all the recommended rules are followed strictly.
- Temperature should be maintained.
- Time period of initiation and completion of transfusion.
- During transfusion, any clinical signs and symptoms related to transfusion are observed and managed quickly.

Post transfusion reaction Check (5)

- The implicated unit's identity was verified by checking its number and ABO/Rh type and confirming if it was issued to the intended recipient.
- Clinical history and examination of patient

Post transfusion reaction investigations (5)

Gross examination:

- Blood bag and transfusion set examination.
- The patient's supernatant plasma observed.
- Serological testing on pre- and post transfusion samples:
 - ABO and Rh typing of the patient and implicated blood component by both forward and reverse.
 - Compatibility done by microscopy and GEL card method.
 - Direct Antiglobulin Test (DAT) and Indirect Antiglobulin Test (IAT) with the patient's post-transfusion sample.
 - Post Transfusion of Urine examination done by routine and microscopy.
 - Blood bags are given for culture to identify any bacterial colony.

Result

- Table 1: BTR occur in various issued blood component

VARIOUS COMPONENT	COMPONENT ISSUED	NO. OF BTR
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PCV	6999	18
FFP	6967	00
PRC	3201	02
CRYO	97	00
TOTAL	17264	20

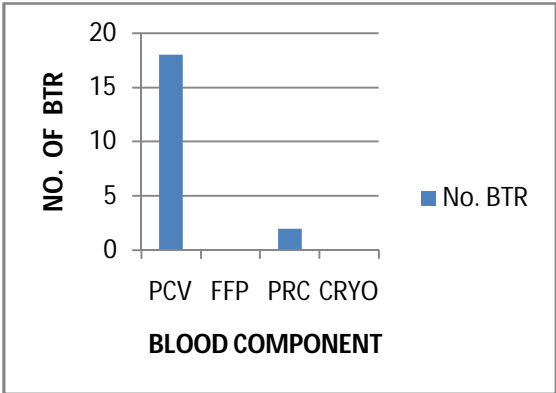
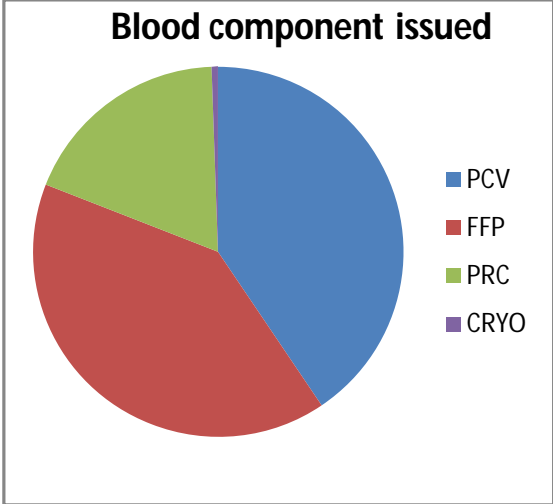
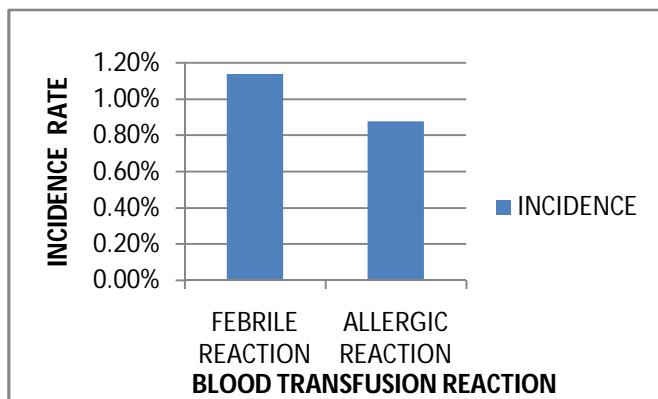


Table 2: Incidence in various BTR

BTR/1000 transfusion	Incidence
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Febrile reaction	1.14%
Allergic reaction	0.88%



Classification of transfusion reaction in 20 patients

TYPE	NO. OF PATIENTS
Acute (within 24 hour)	
AchTR	No reaction
Immune hemolytic	No reaction
Non immune transfusion	No reaction
Acute non hemolytic	No reaction
Febrile	08
Allergic	09
Bacterial sepsis	No reaction
Non TRALI associated dyspnea	02
Headache, chest pain	00
Uneasiness, giddiness	01
Delayed(after 24 hour)	No reaction

Discussion:

- The data obtained in the present study was compared with data obtained by other author.
- Incidence rate of various reactions of present study and other study.

BTR/1000 transfusion	Present study Incidence	Robillard, Karl & Tranz at al. study(4)
Febrile reaction	1.14%	1.20%
Allergic reaction	0.88%	0.96%
Hemolytic Reaction	0.00%	0.02-0.07%

- In the present study, incidence of febrile, allergic and hemolytic reaction is lower than other study.
- The study was conducted to assess the risk associated with blood component transfusion and to assess the effectiveness of haemovigilance strategy in our institution.
- The most important concerns are the dependence on the awareness of physicians and other health care workers to (2) look for adverse effects and their reporting, (3) determine whether the effects could have been caused by transfusion.
- The recent testing facilities have lowered the incidence of transfusion-transmitted diseases to the minimum; however, the incidence of adverse events due to human errors, ABO incompatibility, alloimmunization, bacterial contamination, and immunomodulation phenomena remain a matter of concern.(5)

Conclusion

- Haemovigilance is an essential component of quality management in a blood system and is needed for the continual enhancement of quality and safety of blood products and transfusion process by monitoring and safeguarding the adverse events associated with the use of blood products.
- We are following haemovigilance strategy as a pilot effort. So, we are receiving low adverse reactions compare to other studies.

References

- 1) De Vries RR, Faber JC, Strengers PF. Hemovigilance: An effective tool for improving transfusion practice. Vox Sang. 2011;100:60–7.
- 2) Aubuchnon JP, Kruskall MS. Transfusion safety: Realigning efforts with risks. Transfusion. 1997;37:1211–6.
- 3) Mazzei CA, Popovsky MA, Kopko PM. Technical manual. 16th ed. Maryland: American Association of Blood Banks; 2008. Noninfectious complications of blood transfusion; pp. 5–51.
- 4) Robillard P, Karl Itaj N. Incidence of adverse transfusion reactions in the Quebec Hemovigilance System. Vox Sang. 2002;83:120.

5) Moore SB, Taswell HF, Pineda AA, Sonnenberg CL. Delayed hemolytic transfusion reactions: Evidence of the need for an improved pretransfusion compatibility test. *Am J Clin Pathol.* 1980; 74:94-7.

6) Lichtiger B, Perry-Thornton E. Hemolytic transfusion reactions. *Am J Clin Pathol.* 1984; 2:438-42.