

Eliminating wrong blood transfusions — recent advances

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Blood transfusion is and will remain a life-saving therapeutic option for many diseases. However, zero risk of transfusion still remains a dream to be fulfilled. The major risks of blood transfusion include transfusion transmitted infections (TTI) and adverse transfusion reactions.¹ With sensitive screening tests for infectious diseases and introduction of pathogen inactivation methods, the risk of TTI has greatly reduced. However, the worldwide problem now is the risk of wrong transfusion.²

Wrong transfusions have plagued transfusion practice in the last century and still remain unresolved. Wrong transfusion is a broad term. The term wrong transfusion encompasses all cases where wrong ABO/Rh blood group unit is administered leading to serious haemolytic reaction or when a wrong type of blood component is transfused, for instance, red cells instead of plasma. According to Serious Hazards of transfusion (SHOT) cumulative data from 1996-2013, incorrect blood component transfused (IBCT) remains the most common transfusion related adverse event.³ IBCT is an avoidable mistake but it had remained unchanged over years despite multiple interventions including education, training and guidelines. It must also be noted that if transfusion of blood components is not justified and the patient is unnecessarily exposed to the risks of blood therapy, it would be classified as wrong transfusion.

Safety in transfusion medicine is important because patient's life is at stake and it must be the top priority of health care professionals. So the question is that how can we minimize, if not completely eliminate, wrong transfusions.

First of all, reporting of transfusion reactions is essential as it leads to identification of root causes. This would enable the organizations to take corrective and preventive actions and minimize future occurrence of similar events.⁴ The role of hospital transfusion committees in this respect cannot be emphasized more. Each hospital should have an active and functioning transfusion committee with members from all clinical departments, nursing

department and blood bank. The committee shall be responsible for collecting haemovigilance data and analyzing root causes of all wrong transfusions. Repeated education of all personnel involved in transfusion process is another way to promote transfusion safety. This can be done by conducting CMEs, arranging workshops and lectures for physicians and nurses and circulating educational flyers on regular basis.

Recently, advances in information technology (IT) have tremendously improved transfusion safety. Using IT technology in blood bank minimizes human errors.⁵ For example, introduction of electronic patient identification system using barcoding technology reduces errors related to patient identification. A study has reported significant improvements in transfusion safety using end to end electronic control in transfusion process.⁶ With respect to transfusion safety, a slight breach in patient identification can lead to dire consequences including death. Most of mismatched transfusions results from failure to correctly identify the intended recipient. Administration of blood/blood component thus remains a major point of weakness in the transfusion chain. Proper attention must be paid to correctly identify the patient at time of blood administration.

Some of the European countries started Bedside ABO grouping to minimize the incidence of wrong transfusions. Bedside ABO grouping is used as a final check to verify patient's blood group before transfusion. A study from France reported that linking bedside ABO grouping with another patient's identity check raises the sensitivity of the whole bedside identification procedure to 99.65% for detection of ABO incompatibilities.⁷ This linkage ensures that the right blood is given to the right patient. This was initiated by French regulation in 2003 and incidence of ABO incompatible transfusions have declined much faster in France than in any other country and the French haemovigilance system reports the lowest rate of ABO incompatible transfusions. Bedside ABO grouping has also been adopted by one of the leading hospitals of Pakistan.

In addition to patient misidentification errors, some cases of wrong transfusion are attributed to errors at transfusion laboratory level. This could be due to errors in

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performing and interpreting blood group or transcription errors. In some cases there is wrong release of blood from blood bank. To reduce errors in blood bank, the best solution in today's world is automation in blood bank. It is reported that there is an exponential error reduction in pre transfusion testing with automation.⁸ Automation reduces human intervention by automatically performing the blood group and transmitting results into lab information system.

To facilitate physicians in judiciously ordering blood/blood components and aid in decision making, computer physician order entry systems (CPOE) have been designed. The system helps physicians make appropriate requests and avoid unnecessary transfusions. CPOE has been in place for pharmacy for many years and has shown to reduce serious medication incidents by 55%.⁹ The same findings may be applicable to blood transfusion.

To conclude, most of the errors leading to wrong transfusion are avoidable. It is time for us to adopt the latest technologies available worldwide to improve

transfusion safety in our country.

References

1. Vamvakas EC, Blajchman MA. Transfusion-related mortality: the ongoing risks of allogeneic blood transfusion and the available strategies for their prevention. *Blood*. 2009; 113:3406-17.
2. Dzik WH. Technology for enhanced transfusion safety. *Hematology Am Soc Hematol Educ Program* 2005: 476-82.
3. Bolton-Maggs PH. Bullet points from SHOT: key messages and recommendations from the Annual SHOT Report 2013. *Transfus Med* 2014; 24: 197-203.
4. Ansari S, Szallasi A. 'Wrong blood in tube': solutions for a persistent problem. *Vox Sang* 2011; 100: 298-302.
5. Dzik WH: New technology for transfusion safety. *Br J Haematol*. 2006; 136:181-90.
6. Davies A, Staves J, Kay J, Casbard A, Murphy MF. End-to-end electronic control of the hospital transfusion process to increase the safety of blood transfusion: strengths and weaknesses. *Transfusion* 2006; 46: 352-64.
7. Daurat G. [Yes, we should keep ABO agglutination test within bedside transfusion checks]. *Transfus Clin Biol*. 2008; 15: 322-6.
8. South SF, Casina TS, Li L. Exponential error reduction in pretransfusion testing with automation. *Transfusion* 2012; 52: 815-87S.
9. Bates DW, Leape LL, Cullen DJ, Laird N, Petersen LA, Teich JM, et al. Effect of computerized physician order entry and a team intervention on prevention of serious medication errors. *JAMA*. 1998; 280: 1311-6.