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Full Length Article

Knowledge of appropriate blood product use in perioperative patients among clinicians at a tertiary hospital

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ABSTRACT

Background: Blood products are an expensive and scarce resource with inherent risks to patients. The current knowledge of rational blood product use among clinicians in South Africa is unknown.

Purpose of research: To describe the level of clinicians' knowledge related to all aspects of the ordering and administration of blood products from the South African Blood Services for peri-operative patients at a tertiary hospital.

Method: A self-administered survey was distributed to 210 clinicians of different experience levels from the departments of Anaesthesiology, General Surgery and Trauma, Orthopaedic Surgery and Obstetrics and Gynaecology at the study hospital. The questions related to risks, cost, ordering procedures and transfusion triggers for red cell concentrate (RCC), fresh frozen plasma (FFP) and platelets.

Results: A total of 172 (81.90%) surveys were returned. The overall mean for correctly answered questions was 16.76 (±4.58). The breakdown by specialty was: Anaesthesiology 19.98 (±3.84), General Surgery and Trauma 16.28 (±4.05), Orthopaedic Surgery 13.83 (±4.17) and Obstetrics and Gynaecology 15.63 (±3.51). Anaesthesiology performed better than other disciplines ($p < 0.001$) and consultants out-performed their junior colleagues ($p < 0.001$). Seventy percent correctly identified triggers for RCC transfusion and 50% for platelets. Administration protocols were correctly defined by 80% for RCC and FFP just over 50% for platelets. Thirty eight percent of respondents deemed infectious and non-infectious risk sufficient to obtain informed consent. Knowledge of costs and ordering was below 30%.

Conclusion: Clinician's knowledge of risks, resources, costs and ordering of blood products for perioperative patients is poor. Transfusion triggers and administration protocols had an acceptable correct response rate.

Abbreviations: RCC, Red Cell Concentrate; FFP, Fresh Frozen Plasma; SANBS, South African National Blood Service; ANOVA, Analysis of Variance.

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1. Introduction

Modern medicine has a continued reliance on allogeneic blood products. This is an expensive and scarce resource, with inherent risks to patients. Escalating costs and declining supplies have deepened the need to rationalise transfusion practice. Several transfusion guidelines have been developed, however, awareness and adherence to these guidelines seems to be lacking as demonstrated in a number of surveys (Hebert et al., 1998; Matot et al. 2004; Nutall, Stehling, Beighley, & Faust, 2003; Stehling, Ellison, Faust, Grotta, & Moyers, 1987).

Between 5000 and 6000 blood products are ordered monthly from the South African National Blood Service (SANBS) at the study hospital and up to 30% of these orders are cancelled or wasted (SANBS 2012).

In South Africa it is of paramount importance that medical professionals have the competencies, skills and knowledge to administer the limited and expensive blood products safely to the most appropriate patients. There is no current literature evaluating the level of knowledge of rational blood product use in this country. The aim of this research was to describe the level of clinicians' knowledge related to the ordering and administration of blood products from the SANBS for perioperative patients at a tertiary hospital.

The primary objectives of the study were to determine the knowledge of clinicians with regard to:

- risk associated with the transfusion of blood products,
- resources and costs associated with the transfusion of blood products,
- donations, ordering and return of blood products,
- safe administration of blood products to a patient, and
- transfusion thresholds and triggers for blood product administration.

The secondary objectives were to compare knowledge levels among different specialty departments and clinician ranks.

2. Method

A prospective, descriptive, contextual study design was used. Ethics approval was obtained from the Human Research Ethics Committee (Medical) (M120748) of the University of the Witwatersrand and the other relevant authorities. The research was conducted according to the principles of the Declaration of Helsinki (2008).

The study hospital is a 2688 bed hospital where 65,000 surgeries are performed annually. The study population consisted of clinicians working with perioperative patients in the Anaesthesiology, General Surgery, Trauma, Orthopaedic Surgery and Obstetrics and Gynaecology Departments belonging to the professional ranks of intern, medical officer, registrar and consultant. A purposive sampling method was used and the sample size was realised by the number of respondents who completed the questionnaire. The exclusion criteria of the study were:

- clinicians who indicated that they have never been involved in the administration of blood products at the study hospital,
- who declined to take part in the study,
- who were on annual, special or sick leave and
- surveys that were less 50% complete.

A 20 question, self-administered, multiple-choice anonymous survey was drawn up based on a review of the literature (Hebert et al., 1998; Irving, 1992; Matot et al. 2004; Nuttall et al., 2003; Stehling et al. 1987; Turgeon et al. 2006; Vlaar, in der Maur, Binnekade, Schultz, and Juffermans, 2009) and the SANBS Clinical Guidelines for the use of blood products ensuring content validity. Three senior anaesthesiologists and a senior haematologist, all with blood product expertise, reviewed the questionnaire ensuring face validity. Minor changes were made based on recommendations given. The adapted survey was given to 10 clinicians to assess for clarity. No further suggestions were made.

The survey assessed the following:

- formal blood product education attendance,
- professional rank and department of clinicians,
- knowledge of risks of blood product administration,
- knowledge of resources and costs associated with the transfusion of blood products,
- blood product donation, ordering and return administration of blood products according to the SANBS guideline, and
- transfusion thresholds and triggers for blood product administration.

The author (BY) addressed clinicians at departmental academic meetings (January to March 2013), explaining the study and inviting the clinicians to take part. The survey and an information letter were distributed to willing respondents. The completed surveys were collected at the meetings' conclusion in a sealed box. Return of surveys implied consent to take part in the study. The author (BY) was present during the meetings to prevent data contamination and answer any respondents' questions.

Data were analysed using descriptive and inferential statistics using Microsoft Excel for Mac 2011 and GraphPad InStat. For descriptive analysis of data that were normally distributed mean and standard deviation (SD) were used. ANOVA testing was used to compare means between groups. Bonferroni testing and correction procedure was used for post-testing to identify where the significant differences lie. A p-value < 0.05 was taken as statistically significant. Unanswered questions were assumed to be the ‘don't know’ option at data capture. No returned surveys were discarded as all had been more than half completed.

3. Results

There were 210 surveys distributed with 172 (81.90%) returned. Demographics of respondents are demonstrated in Table 1.