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USING KNOWLEDGE OF BLOOD PRODUCTS TRANSFUSED to determine blood requirements for hospitals in rural and urban settings

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INTRODUCTION
Knowledge of blood products transfused is vital in determining blood requirements for hospitals. The National Blood Service Zimbabwe (NBSZ) is a non-profit making company mandated by the Ministry of Health and Child welfare to provide safe blood and blood products. To date NBSZ doesn`t have an agreed method of determining an accurate estimate of blood needs in Zimbabwe. Hospitals also have no standard formula for determining their blood requirements to inform blood ordering patterns. A preliminary study was conducted to address this gap. The study aimed to investigate blood transfused and use the knowledge in determining blood requirements for two hospitals.

METHODS
A retrospective study on the use of knowledge of blood products transfused to estimate the blood needs of one rural hospital and one urban hospital in Zimbabwe was carried out from 1st January 2013 to 30th April 2013. The data was collected from patient medical records and the blood bank register. A data collection tool was designed with the following details: hospital number, ward, age or date of birth, sex, haemoglobin concentration, clinical diagnosis, date of transfusion, blood component type, donor group, patient group, amount of blood transfused, transfusion not done because the blood was not available for transfusion at the hospital. The data collected was then transferred from hard copies by capturing it into excel spread sheet and analysed using Stata version 10.0 statistical package. Analysis was done on the blood supplies to the hospitals, clinical conditions transfused; blood group and component types transfused the haemoglobin concentration, ward, age and sex of the transfused patients. The Pan American Health Organization (PAHO) model formula was used to determine the actual, estimated future, projected future and the yearly blood requirement.

RESULTS
The rural hospital transfused 45 units of red cell packed cells (PCs) during the period of the study. Neither fresh frozen plasma (FFP) nor platelets were transfused at the rural hospital during the study period. The urban hospital transfused 537 units of PCs, four platelets, and nine FFP during the first four months of 2013. The estimated 2013 blood requirement for the urban hospital was 1,764 PCs, 31 FFPs, and 19 platelets. The estimated 2013 blood requirement for the rural hospital was 149 PCs, no FFPs, and no platelets.

DISCUSSION AND CONCLUSION
The blood supply was 62 and 599 PCs to the rural and urban hospital respectively. Medical, surgical, obstetrics and gynaecological mainly anaemic patients aged eight months to 96 years were transfused ABO compatible blood with females being transfused more blood than males. The NBSZ can expand this research to gather further evidence for accurately estimating blood needs of Zimbabwe. The shortage of specialist doctors at the hospitals was a challenge in implementing the PAHO model and the classification of diseases wasn't done according to the international classification of disease codes. Although complex it's possible to estimate blood needs for Zimbabwe.

THE TRANSFUSION PRACTICES OF CLINICIANS

in a regional hospital in Durban in KwaZulu-Natal

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INTRODUCTION AND BACKGROUND

Red cell concentrates (RCC) transfusion is required to increase the oxygen carrying capacity of blood by raising
haemoglobin (Hb) concentration in patients with acute or chronic anaemia. However there is a wide variability in the use of red cell concentrates that appears to reflect the clinicians individual practice rather than the patients clinical status. Even though there are guidelines on the use of blood and blood products, there is no consensus on the precise indications for their use.

OBJECTIVES

- To determine the extent to which the doctors at Prince Mshiyeni Memorial Hospital (PMMH), a regional hospital do not adhere to the Clinical Guidelines for the Use of Blood Products in South Africa by assessing the prevalence of inappropriate RCC transfusion and the level of wastage.
- To evaluate the factors that influence the transfusion practices of clinicians at PMMH by assessing the knowledge and attitude with regards to blood transfusion.

METHODS

This was a two phase study.

1. A retrospective cross sectional study was conducted from 01 August to 30 September 2012. A total of 308 consecutive patients case files from PMMH were reviewed. Data was collected using a data collection tool on age, gender, medical discipline, rank of the prescribing clinician, pretransfusion Haemoglobin (Hb). Descriptive statistics namely mean, standard deviation, median, mode and proportions were used to summarize results. Inappropriateness of RCC transfusion was assessed by using the Clinical Guidelines for the Use of Blood Products in South Africa 4th Edition 2008. Cross-matched: transfusion ratio (C: T ratio) was used to assess the level of wastage.

2. Phase 2 was a survey among 228 PMMH doctors to assess their knowledge and attitude regarding the prescribing of red cell concentrates transfusion. A pretested questionnaire was distributed to all 228 blood prescribing PMMH clinicians and 144 responded giving a response rate of 63.16%. The aggregate scores of knowledge and attitude were calculated from the responses. Kruskal-Wallis test was used to test if there was any relationship between rank of clinician and knowledge. The same test was also used to test for relationship between rank of the clinician and attitude.

RESULTS

At this regional hospital the proportion of inappropriate use of RCC was 13.64%. The level of wastage was 14 units of RCC for every 100 units ordered (C: T was 1.17). Guidelines were not used by 60% of the doctors. Twenty five per cent of doctors had low level of knowledge on transfusion.

CONCLUSION

The non-adherence by clinicians to National Clinical Guidelines, the inappropriate use of RCC, the 14% level of wastage and the 25% low level of knowledge by the clinicians at this regional hospital remain our concerns and would need to be addressed with extensive, orchestrated education

BLOOD TRANSFUSION AND INFORMED CONSENT

at a Tertiary Hospital in the Eastern Cape

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BACKGROUND

The concept of informed consent for medical treatment was introduced in South African law in section 12(2) of the Constitution, subsection 6(1)(c) of the National Health Act of 2003 as well as through case law. It is further underpinned by the Code of Ethics of the Health Professions Council of South Africa. Informed consent should address, inter alia, benefits and costs of the proposed intervention as well as risks, complications and potential alternatives. Blood transfusion if used appropriately, may be a life-saving procedure, reducing mortality and morbidity and improving quality of life, but is not without potentially serious, if not life-threatening risks, and as such requires documented informed consent from the proposed recipient. We evaluated the current practices regarding documenting informed consent for blood transfusion at a tertiary hospital in the Eastern Cape.

METHODS

For a study of blood transfusion and HIV, we conducted a retrospective audit and analysis of the hospital records of all patients admitted during a 3-month period at a tertiary hospital in the Eastern Cape. Patients receiving blood transfusions were identified from electronic reports generated by the local blood bank. The admission records (patients' paper based hospital folders) were traced following the discharge of the patients. These records were manually reviewed and data were gathered on whether written informed consent was taken for blood transfusion and if so, whether the consent document was completed correctly. Where patients received more than one blood transfusion during a particular admission, we only assessed the data related to the first transfusion episode.

RESULTS

We assessed 212 first transfusion episodes. Patient admission records (patient folders) were untraceable for 10 (4.7%) transfusion episodes. Of the remaining 202 patient admission records, only 138 (65.1%) contained consent forms and of these, 38 (27.5%) were not completed correctly. Types of errors and omissions included failure to record the name of the clinician taking the consent, the name of the patient as well as failing to have the document correctly witnessed. In total 102 (48.1%) of patients either did not have consent forms in their records or the forms were completed incorrectly.

CONCLUSION

Over one third of patients assessed following the administration of a blood transfusion did not have properly documented informed consent in their hospital records. This would suggest a lack of understanding on the importance of documented informed consent on the part of both the prescribing clinicians as well as the nursing staff responsible for administering the blood transfusions. Several court cases in South Africa following the transmission of a transfusion transmissible infection such as HIV, centered on the alleged lack of informed consent having been obtained from the recipient. It is our recommendation that healthcare workers be sensitized to the need.

MOTIVATORS AND DETERRENTS TO BLOOD DONATION AMONG BLACK SOUTH AFRICANS:

A Qualitative Analysis of Focus Group Data

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BACKGROUND

The South African National Blood Service (SANBS) collects 805,000 donations per annum from voluntary nonremunerated donors in South Africa, but maintaining an adequate inventory is challenging because majority Black donors give only a minority of donations. SANBS is therefore confronted with the challenge of establishing a sustainable and ethnically diverse donor pool with a key focus on recruitment and retention of Black donors. We performed a qualitative study to measure motivators and deterrents to blood donation among Black South Africans, and compare these findings to other international data.

METHODS

Professional moderators conducted 13 focus groups including a total of 97 Black South Africans (58 donors and 39 non-donors); participants were further stratified by age group and geographical location in the greater Johannesburg area. Professional focus group moderators explored key motivators and deterrents to blood donation. Video recordings and transcripts of the focus groups were classified with a coding scheme based upon the Bednall and Bove taxonomy of motivators and deterrents (Transfus Med Rev, 2011), with minor modification. Using NVivo 9 software (QSR International, Burlington, MA), mentions of each motivator or deterrent were counted and classified according to the coding scheme to allow a quantitative summary of the results, both for all subjects and stratified by donors and non-donor status.

RESULTS

Although most motivators and deterrents in this South African study have been described in the literature, the distribution of specific motivators differed from those in other countries. There were 463 unique mentions of motivators (362 by donors and 101 by non-donors), in descending order of frequency: promotional communications or marketing (28% of all mentions), incentives (20%) and prosocial motivation (16%, mainly altruism). Surprisingly, there were differences between donors and non-donors in mentions of prosocial motivation (14% vs. 25%, respectively) and incentives (18% vs 28%). Only 8% of donors and 1% of non-donors regarded convenience of collection site as a motivator. There were 376 mentions of deterrents (231 by donors and 145 by non-donors), in descending order of frequency: fear (41%), negative attitudes (14%) and lack of knowledge (10%). Fears were related to needles (11%), viral infection (5%), discovered illness (5%) and fainting (5%). Fear and negative attitudes were more commonly reported by non-donors compared to donors. Among negative attitudes, scepticism and cynicism were often related to perceived racial and economic discrimination in blood collection and allocation. Finally, 13% of the non-donor group perceived lack of donation eligibility for health reasons including both valid (low body weight, iron deficiency) and invalid (poor diet, medications) reasons.

CONCLUSION

In contrast to Bednall and Boves findings, promotional communication was a more frequent motivator than incentives or prosocial motivation (altruism), and convenience ranked even lower. As reported by many authors, fear and lack of awareness were strong deterrents, but scepticism and cynicism engendered by perceived racial discrimination in blood collection were unique to the South African environment. These findings will be useful in designing and testing targeted donor marketing campaigns aimed at the Black South African population.

MONITORING HIV RESIDUAL RISK AND BLOOD SAFETY IN SOUTH AFRICA –

results from the analysis of SANBS data over a 6 year period

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BACKGROUND

Recognising that the donor profile at the time was not sustainable, SANBS implemented nucleic amplification testing (NAT) in 2005. A strategy was adopted to increase the pool of younger & black donors. The strategy has been successful in changing the donor population profile to be more representative and sustainable. However, it should be noted that this also increased the HIV Residual risk. Prevalence rates in the donor population mirrors the background HIV prevalence in the antenatal and general populations where the younger and black populations have higher prevalence rates.

AIM

SANBS continuously monitors several parameters to ensure the safest possible blood for the country. It is important for the risk to be communicated to clinicians & health care workers to ensure their patients are suitably informed of the risks. This analysis looked at current Residual Risk and the trend from 2006/7 to 2012/13.

METHODS

The analysis in this study is based on the data extracted from the SANBS BI Database. SANBS uses the most sensitive testing strategy available for blood screening (IDNAT). The Ultrio Plus assay has a window period of 4-5 days for HIV, 21days for HBV and 3 days for HCV. The donor prevalence of HIV, HBV & HCV is continually monitored and policies governing blood safety reviewed annually. We use the Weusten model to calculate HIV residual risk on a quarterly basis & monitor trends.

RESULTS

In 12/13 Year, SANBS collected 797623 units (of which 75% were from repeat donors), equating to 2200 units being tested daily. The theoretical risk of HIV transmission, based on Repeat donations (Weusten model (Ref)) is 1 in 85736 transfusions (assumption: 1 virion is the minimum infectious dose). In 2005 the risk aimed for was <1:100 000. With an assumed minimum infectious dose of 316 virions (thought to be more realistic), the estimated risk is 1 in 2.5million. The attached table shows the calculated risk remained less than 1 in 100000 until 2010 and increased from thereon onwards. The donor profile changed to include more black donors from 10.6% in 2006/7 to 32.3% in 2012/3. The HIV prevalence in the donor population increased from 0.11 to 0.21% but appears to have stabilised. Detailed demographics of the donor profile will be presented.

CONCLUSION & RECOMMENDATION

Latest available laboratory tests do not close the window period. The increasing trend noted in the HIV Residual risk is of concern but is continuously monitored. The safety of the blood supply is ultimately determined by multiple interventions i.e. the donor selection strategies, laboratory testing strategies, hierarchical blood issuing & releasing policy and appropriate use of blood. Continuous surveillance & adaptation of strategies to mitigate the risk such as focusing on retaining existing donors to reduce the overall prevalence are high priority in maintaining a safe blood supply.

A CASE STUDY:

Discordant results between NAT and serology indicating contamination of sample and its subsequent resolution

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BACKGROUND

Nucleic Acid Testing (NAT) plays an important role in screening donated blood for specific infectious markers because it is a very sensitive method of testing. However due its sensitivity, contamination remains a major concern when handling samples for testing.

METHOD

Index donation was tested on Tigris analyser (NAT) and Prism analyser (serology) for routine markers. . The index donation sample (IDs) was found initially reactive (IR) on Tigris and as per WPBTS NAT algorithm the donation was retested in duplicate and three Discriminatory Assays were performed.

RESULTS

The IDs was negative for all routine markers on Prism but was Ultrio Plus repeat reactive and discriminatory positive for Hepatitis B (HBV). The IDs was sent to an external Reference Laboratory, and the following results were obtained:

- HBV viral load of 157 copies/mL
- Liver Function Tests (LFT), within normal ranges except for slightly lower values for S-Albumin and S-Alkaline Phosphatase.
- Negative HBV antibody results.

While this discordancy does not occur often, it was not unusual. Donor appeared to be in the HBV serological window period.
As per WPBTS testing algorithm, whenever discordant results are obtained between NAT and serology, the plasma bag is retested. The plasma bag was negative for NAT and serology, including all HBV antibody tests. At the clinic where the donation occurred, 14 of the donors, who were O+ and were bled at approximately the same time, were found negative for the routine screens.

The Paternity Laboratory at WPBTS tested 15 DNA markers that showed conclusively that blood from the IDs and the plasma bag, came from the same donor. DNA testing has subsequently shown that the sample from the donors latest donation genetically matched the sample from the index donation.

Index donation was bled on 11 January 2013. Previous donation was on 9 November 2012 and it was negative. Samples were taken from the donor thrice after the index donation (25th January, 1st February and 3rd May 2013) and all results were negative. LFTs on two of the follow-up donations were within normal ranges except for slightly raised levels for S-Globulin.

DISCUSSION

DNA markers ruled out concerns about a possible donor mismatch between IDs and paperwork. This appeared to be a case of contamination. This was the only positive sample in the entire run and it was situated in the middle of the run, away from Calibrators and controls.

The most obvious explanation is that somehow the sample was contaminated.

What this case has proven however is the importance of testing the plasma bag whenever discordant results between serology and NAT are observed. WPBTS has also introduced retesting the other 2 samples taken at donation (used for Blood Grouping and on the Prism) whenever discordant results are observed.
Donor has since been reinstated.

TRANSFUSION-TRANSMITTED MALARIA in the Western Cape

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BACKGROUND

Western Province Blood Transfusion Service is situated in the non-endemic malaria province of the Western Cape. Transfusion Transmitted Malaria (TTM) is uncommon in the Western Cape with only two cases of transfusion transmitted Plasmodium falciparum malaria having been reported between 2001 and 2010. In 2010 Plasmodium falciparum malaria was transmitted via a platelet transfusion donated by a donor from Democratic Republic of Congo. The donor had resided in South Africa for three years and was asymptomatic at the time of donation but had a low level parisitaemia detected on malaria PCR and thin smear.

METHOD

This case prompted a review of malaria deferral policies in the transfusion services in South Africa. In June 2012 a new malaria policy was introduced which defers donors who have grown up in a malaria area for a three year period after leaving the malaria area. These donors will then be deferred for a further three years after each visit to any malaria endemic area.

RESULTS

In December 2012, despite the new deferral criteria, it was reported that an 81 year old female patient with unexplained febrile illness had tested positive for Plasmodium malariae on PCR testing. The patient had received two red cell concentrates in October 2012 during surgery for insertion of arterial shunts. The donors of the red cell concentrates were identified from transfusion records, counselled and tested for malaria using PCR technique, malaria antigen testing and malaria smears.

One donor tested positive on malaria PCR testing and Plasmodium malariae was identified. He had left Nigeria, his country of origin, in 2007 at the age of 18. The donor had not travelled to any malaria endemic areas since 2007, he gave no history of malaria and was asymptomatic at the time of the index donation. He was asymptomatic at the time of interview.

CONCLUSION

With an increase in travel into malaria endemic areas and greater population movement from malaria endemic countries, it is important to regularly review deferral strategies and ensure that policies are consistent and accurately applied. Any deferral strategy should aim to minimise the risk of TTM without the unnecessary exclusion of donors.

Is it time to consider laboratory screening of donors for malaria in the Western Cape? As current malaria testing is not sufficiently sensitive for blood donation screening this could have a negative impact on the donor base. Whatever strategy is adopted there remains a small risk of TTM as people infected with Plasmodium malariae and Plasmodium falciparum may remain asymptomatic carriers longer than the three year deferral period. Malaria must always be considered in any patient with unexplained febrile illnesses post transfusion.

FOLLOW UP OF HIV POSITIVE DONORS WHO COME FOR COUNSELLING - did we miss any risk factors

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BACKGROUND

South African National Blood Service (SANBS) collects approximately 800 000 donations annually. Selection of voluntary donors who are at low risk of transfusion transmitted viral infection (TTVI) is central in maintaining the safety of the blood supply. SANBS has many safeguards from donor recruitment, collection, testing, processing and hierarchical/quarantine issuing to ensure a national safe blood supply. The pre - donation evaluation consists of a self administered written questionnaire, followed by a confidential interview with a nurse counselor. Evaluation of the effectiveness of the selection process has not been done in South Africa. Such investigation of the process may offer opportunities to further improve transfusion safety.

AIM

The aim of the analysis is to assess the prevalence of HIV risk factors among the HIV positive donors who came for counselling at SANBS.

METHODOLOGY

This analysis is based on the retrospective review of 308 donor records from donors that tested HIV positive after donating blood and availed themselves for HIV counseling at SANBS.

RESULTS

Between 1 January and 30 June 2012, 657 donors were found to be HIV positive and 308 (47%) were counselled at SANBS. Of these, 127 (48%) had identifiable risky behavior that were missed by the donor questionnaire, as compared to 158 (51.3%) with no identifiable risk behavior. The rates of disclosure of risk factors by donors with TTVIs differ by gender, race, and by province. Having more than one sex partner was identified as the most common risk factor.

CONCLUSION

Despite both donor education and clear implemented selection criteria, more than half of positive donors subsequently disclosed risk factors that would have resulted in deferral if reported in pre-donation screening.