



Full Length Research Paper

Study of Patient Safety Regarding Blood Transfusion in four Hospitals in Khartoum State

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The objective of this study is to assess the knowledge, attitude and practice of health care providers concerning patient safety in blood transfusion. As blood transfusion and donation by humans will continue to be the major source for blood and blood components, we evaluate the patient safety regarding the knowledge, and training of health care providers. A descriptive study done in four big hospitals in Khartoum State: Omdurman Maternity Hospital, Khartoum, Khartoum Bahry, and Saudi hospitals in 2011. The study was carried on health care providers in the four hospitals who agreed to be included in the study. The data was collected by a well designed questionnaire covering the aspects of patient safety in blood bank according to standards. The data was collected by the investigators after an informed consent. Total number of 500 health care providers were included in the study. The study showed that 375(75%) of health providers knowledge and attitude regarding safety is good, but 125(25%) of them are not adherent to patient safety standards. Most of the health care providers involved in blood transfusion process need more training concerning patient safety 328(66%). Most of the health providers did not use personal protective equipments. Health care providers know most of patient safety standards regarding blood transfusion in these hospitals. Their knowledge and attitude towards patient safety is good in spite of absence of written guide lines in these hospitals.

Keywords: Patient safety, blood transfusion, health care

INTRODUCTION

Blood transfusion is an essential component of health care which save millions of lives each year. Every second someone in the world needs blood for surgery, trauma, severe anemia or complication of pregnancy. Despite ongoing efforts, it will still be many years before artificial substitutes can routinely replace the need for donate human blood. In developed countries, transfusion is most

commonly used to support advanced medical and surgical procedures including trauma, cardiovascular surgery, neurosurgery and transplantation. In countries where diagnostic and treatment options are limited, a much greater proportion of blood is used to treat women with obstetric emergencies and children suffering from severe anemia, often resulting from malaria and malnutrition. Patient safety has been defined as (the reduction and mitigation of unsafe acts within the health care system, as well as through the use of best practices shown to lead to optimal patient outcomes). One way to

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measure patient safety is to examine the risk of adverse events, unexpected and undesired incidents directly associated with the care or services provided to the patient. While some risks are unavoidable based on what we know today, there is growing evidence about what works to reduce the risk (Royal College of Physicians of Canada, 2003). The World Organization (WHO) has identified blood safety as a health care issue requiring high priority and launched the Global Collaboration for Blood Safety(GCBS) as a world effort to improve blood safety by building on knowledge, utilization existing expertise, promoting dialogue and suggesting realistic, effort and practical mechanism (Klein et al., 2005). Blood transfusion is a potentially hazardous procedure which should only be given when the clinical benefits to the patient outweigh the potential risk, the most important of these being acute hemolytic reactions and transfusion transmitted infections. Every country needs to meet its requirements for blood and blood products and ensure that blood supplies are free from HIV infection, hepatitis viruses and other life threatening infections that can be transmitted through unsafe blood (Lura, 2007). Blood transfusion service is a vital part of the National Health Services and increasing advancement in the field of transfusion technology has necessitate to enforce regulations to ensure the safety and efficacy of biologies, which include blood and its components and diagnostic reagents and devices used by blood establishment. The provision of safe and adequate blood is a government responsibility and should be an integral part of each country's national health care policy and health care infrastructure. WHO recommended that every country should put in place policies, system, and structure to ensure the safety, quality, assess ability and timely availability of blood and blood products to meet the needs of all patients who require transfusion. The blood transfusion system has made significant advancement in areas of donor management, storage of blood, grouping and cross matching, testing for transmissible infections etc. For quality, safety and efficacy of blood and blood products, well equipped blood centers with adequate infrastructure and trained manpower is an essential requirement. For effective clinical use of blood its necessary to train clinical staff. The blood Bank Blood Transfusion Service should have its own constitution, which defines the responsibility and authority of the management. Blood should be collected only by a licensed blood bank. Blood should be drawn from the donor by a qualified physician or under supervision by an assistant trained in the procedure. A physician should be present on the premise when the blood being collected. Blood should be accepted only from voluntary, low risk, safe and healthy donors. The blood sample in the pilot tube should be collected at the time of collection of blood by the same person who collects blood. They should be marked before collection. The integral donor tubing of plastic bag should be filled with anticoagulated blood and

sealed in such a manner that it will be available with segment numbers for tractability for subsequent compatibility tests (Ervin et al., 1950). In blood bank, certain tests must be performed on all donated blood. This includes the donors blood group and RH status, screening for unexpected red blood cell antibodies ,must be tested for Hepatitis B, Hepatitis C, HIV, Human T-Lymphocyte Viruses (HTLV). A system should be in place to ensure that final container is labeled after all testing is done. Effective documentation must be accurate in all blood banks. All waste products must be contained in a sealed and disposed in a safe legal manner.

METHODOLOGY

This is a descriptive cross sectional study conducted in four central hospitals in Khartoum state, Omdurman Maternity Hospital, Khartoum Teaching Hospital, Bahry Teaching Hospital and Saudi Hospital. Khartoum is the capital of Sudan with an area of 28.140 square Kilometers. Total population is about 2000000. Its divided into three provinces, Khartoum, Omdurman and Bahry. These four hospital serve population of these provinces, area around Khartoum and in addition to referred patients from other states of Sudan.

All personnel involved in blood transfusion who agreed to participate in this study were included in this study. this include registrars, house officers, lab technicians, midwives and nurses. Variables studied include, training received in patient safety by health care provider, counseling of donor, taking past medical history of donors, examining of donors, check vital signs for donor after donation, inform donors by the result of their screening, investigating donors, criteria for blood donation, safety precautions done in blood bank, concerned disinfection and sterilization in blood bank, safe disposable of waste products and the need for more training in patient safety. the data was collected by a questionnaire covering the aspects of patient safety in these blood banks according to standards, the questionnaire was divided into two parts, one concerning lab technicians and the other covered other health care providers. The data was collected by the investigators and analyzed by using computer program SPSS.

RESULTS

Total number of health care providers participated in this study were 500, 112(22.4%) were Medical registrar, 126(25.2%) were Medical house officers, 128(25.6%) were laboratory technicians, 80 (16%) were nurses, while 54 (10.8%) were midwives.

In this study 120 (83.8%) of laboratory technicians examine the blood donor for vital signs, while 4 (3.1%) only examine them clinically and also 4 (3.1%) did not

Concerning checking blood and patients before transfusion the following table show the responses

List of inspections	yes	percentage	no	percentage
Pre-transfusion check of blood for leakage	332	(89.2%)	40	(10.8%)
Inspect for unusual color	322	86.6%	50	13.4%
Inspect for unusual cloudiness'	302	81.2%	70	18.8%
Inspect for presence of clots	340	91.4%	32	8.6%
Check for patients name	278	74.7%	94	25.3%
Checking patient identification number	56	15.1%	316	84.9%
Checking for blood group	362	97.3%	10	2.7%

examine at all. Majority of lab technicians 498(98.4%) ask the donor about past history of infectious diseases only 2(1.6%) did not ask. All laboratory technicians tested blood for blood group and Rhesus status, Kahn, Hepatitis B,C and HIV. About half of lab technicians examine donor after examination (54%). Most of laboratory lab technicians 118(92.2%) told the donor the result of screening if it was positive while others did not tell. Most of lab technician took precautions in blood bank, all lab technicians handle blood as if it were infectious, 114(89.7%) wash their hands before and after blood donation, 112(95.3%) used sterilized gloves during examination and donation, 34 (25.6%) wash their hands with antiseptic before and after conducting blood donation and 32 (28.1%) wash before and after examination of donor. Most of laboratory technicians 120 (93.8%) agreed for the presence of infrastructure for sterilization and scrubbing in blood banks , but they denied the presence of guide lines for sterilization in these banks. one hundred and four lab technicians(84.4%) received training concerning safety in blood bank, only 20(15.6%) would like to have more training.

Concerning health care providers other than lab technicians that all of them disposed I.V sets into safety box, handled it by disposal gloves, 222(59.6%) of them checked blood before transfusion,160(43%) warmed blood before transfusion. Majority of health care providers 863(98.9%) has good knowledge about symptoms and signs of adverse reaction to blood transfusion, but about 8(2.2%) did not observe these reactions. It was found that 443(92.5%) of health care providers returned the blood to blood bank refrigerator if it's not used while 18(4.8%) put it in domestic refrigerator.

Almost more than 60% of health care providers said there was no national practice and guideline for blood transfusion and 272(73.1%) said there is no available national system of audit at blood transfusion services and 328(65.4%) of healthcare provider need more training concerning patient safety in blood transfusion.

DISCUSSION

The blood transfusion is an essential part Of modern health care. Used correctly, it can save life and improve health. The knowledge, adherence and practice of safety standards are important measures for health providers to prevent adverse outcome. appropriate training personnel's are essential to ensure an efficient and professional services.

In this study the health care providers have a good practice toward donors. Most of health care providers counsel the donor about blood transfusion before conducting donation. Knowing of past medical history and examination of donors before and after conducting donation were found to be directory for assuring standards safety, however 3.1% of health care providers missed important points in tacking history and doing examination before and after conducting donation. In this study all health care provider investigate the donor for HIV, Hepatitis B&C and Khan which is essential for prevention of these diseases. WHO recommended that at a minimum ,blood be screened for HIV, Hepatitis B,C and Syphilis. Of 148 countries that provided WHO data for screening, 41 reported that they were not able to screen all donated blood for one or more of these infections. WHO estimated that lack of effective screening results in up to 16 million new infections with Hepatitis B, 5 million new infections with Hepatitis C, and 160000 cases of HIV infection every year. Overall, 5% to 10 and of HIV infections worldwide are the result of transfusions of contaminated blood or blood products (American Society of Anesthesiologist, 1996). So the health care providers have a good practice toward donation in spite of lack of written check list and guideline in hospitals.

In this study health care providers has a good practice in collecting, labeling and storage of blood pack, most of them wear gloves during examination and donation and conducting blood donation giving good protection for themselves. Pre-analysis errors during blood specimen collection include, wrong blood in tube collected, incorrect

or no label applied to the specimen. In study in UK of 344 errors in (41%) the specimens did not match historical records or failed the date checks, other errors include incorrect patient information (19%), missing independent double check, missing computer transcript (6%), miscommunication (6%), missing contents (1%), (Pagliaro and Rebutta, 2006), and according to Pagilero and Rebutta, the most common adverse event during blood transfusion therapy occurs during pre-analysis (blood specimen collection), typically at the patient's bedside (Pagliaro and Rebutta, 2006).

In this study, 88% of the health care providers have a good practice in observing the patient for adverse reaction of the blood transfusion. Blood transfusion is one of the most common, yet high risk procedures performed on hospital patients. Transfusion of an ABO –incompatible red blood cell unit is associated with significant morbidity and mortality, however, despite the high risk of this procedure, patient misidentification remains a significant problem in transfusion and is a leading cause of ABO-incompatible transfusions, more than 1000 blood samples are estimated to be collected from the wrong patient each day in the United States (Guideline for the use of Fresh-Frozen Plasma, 2004).

In this study, most instruments which used in blood bank were disposable so they did not need to be cleaned by antiseptic. Regarding safe disposal of I.V set, all blood banks and wards contain safety boxes and discarded immediately after use.

The study came out by the fact that health care providers practice on patient safety standards regarding blood transfusion in these hospitals is good in spite of lack of written guideline and check list for accuracy. Training of health care providers on implementation of check list and guideline will improve the standards of blood transfusion.

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