

Improving Blood Transfusion Safety: A Survey on the Knowledge and Attitudes of Health Professionals in Blood Transfusion at the Yalgado Ouédraogo University Hospital Center, Burkina Faso

Abstract

Introduction: National guidelines for best transfusion practices have been disseminated so that their recommendations can be applied to any health facility. This work was part of the approach to promoting transfusion safety. Its objective was to study the knowledge and attitudes of the clinical healthcare professionals in the Yalgado Ouédraogo University Hospital in the field of blood transfusion.

Materials and Methods: The survey-type study was conducted in four clinical departments of the Yalgado Ouédraogo University Hospital Center based on a questionnaire. It involved professionals practicing blood transfusion. The anonymous questionnaire was filled out by the participants themselves. There were multiple-choice questions and open-ended questions.

Results: The participation rate was 64% (192/300). The respondents had an average of 7 years of professional practice and worked in departments such as gynecology and obstetrics, pediatrics, nephrology and medical emergencies respectively in 48%, 26%, 16% and 10% of the cases. The study showed that transfusion therapy is a daily practice in clinical departments. However, knowledge is insufficient and compliance with transfusion best practices is limited.

Conclusion: In order to sensitize health professionals on the particular issue of blood transfusion and to improve their knowledge/skills, continuous training of health workers involved in blood transfusion should be an integral part of the action plans of the medical facilities.

Keywords: Knowledge; Attitudes; Blood transfusion; Health professionals; Blood products

Research Article

Volume 4 Issue 1 - 2017

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Received: December 21, 2016 | **Published:** January 16, 2017

Abbreviations: CNTS: National Blood Transfusion Center; RBCs: red blood cell concentrates; CHU-YO: Yalgado Ouédraogo University Hospital

Introduction

Directors of university hospitals are aware of the need for implementing continuing training programs for health professionals. Until then, this training could be provided in the form of post-graduate education. In particular, the activities carried out in the field of blood transfusion must be integrated into an approach to promoting transfusion safety. The national guidelines on the best transfusion practices (DNBPT) were developed, published and disseminated in Burkina Faso in 2008. These guidelines outline the major steps in blood transfusion and are applicable to any health facility within the territory that collects, qualifies, stores, distributes and uses Labile Blood Products for Therapeutic Use [1]. These guidelines require clinical departments to apply the recommendations in the process of implementing blood transfusion. To ensure that these guidelines are effectively applied by all healthcare professionals, the National Blood Transfusion Center (CNTS) has organized various training sessions. Despite the

training and dissemination of these guidelines, the level of knowledge and compliance with good transfusion practices by health workers with regard to blood transfusion is not known. However, blood transfusion of red blood cell concentrates (RBCs) is a common practice in Burkina Faso given the high prevalence of severe anemia. The 2010 Demographic and Health Survey reported a 94% prevalence of anemia in children aged 6-59 months [2]. Pregnant women and children under 15 are the most vulnerable groups [2]. Malaria is a public health problem, particularly in Sub-Saharan Africa where children under five are the most affected. The purpose of this survey is to assess the knowledge and attitudes of health workers regarding blood transfusion in four clinical departments of the Yalgado Ouédraogo University Hospital (CHU-YO).

Material and Methods

The study was a voluntary and anonymous survey. It was conducted over a four-month period. The four clinical departments of the CHU-YO identified as the largest consumers of red blood cell concentrates based on data from the software for the monitoring of labile blood products of CNTS were selected: gynecology-

obstetrics, pediatrics, nephrology and medical emergencies. The study population is composed of all health workers in these departments who either authorized the transfusion (prescribers) or performed the transfusion procedure (nurses, midwives). After authorization by the general management of the CHU-YO and the heads of the relevant departments, the respondents self-administered the questionnaire. In addition to socio-professional status (age, gender, qualification, place of practice, access to continuing training), the questionnaire was used to assess the level of knowledge and attitudes of health professionals. There were multiple-choice questions and open-ended questions. The answers were grouped according to the type of question. Open-ended questions included the following: risks related to transfusion; the guidance on the RBC; pre-transfusion and post-transfusion examinations, patient information and adverse events. The focus of the multiple choice questions concerned the compliance with best transfusion practices, namely: carrying out pre-transfusion and post-transfusion examinations; pre-transfusion documentary checks; RBCs conservation in clinical departments; transfusion incidents (transfusion monitoring and reporting of transfusion events). The data was entered using the Epi-Info software. The data processing was carried out using the SPSS Statistics 17.0 software, English version.

Results

Out of a total of 300 requests for participation sent to the departments, the questionnaire return rate was 64%, i.e. 192 respondents (98 men and 94 women). Of the 192 participants, 26 (13.5%) had received continuous training in blood transfusion during the past 5 years. The results of the survey are presented in

Tables 1 and 2. With respect to bedside controls, 18% (20/112) used to check the blood group of the RBC and the identity of the patient; 11% (12/112) for the RBC number and the patient's identity and 35% (39/112) for the blood group of the RBC and the patient's blood group. Based on the answers to the open-ended questions (Table 2), some respondents 51.5% (99/192) reported having observed a transfusion event; others i.e. 48.5% (93/192) reported no adverse events related to blood transfusion during their practice. The type of open-ended questions is reported in Table 2. The answers to these questions are detailed below. The risk to the donor was either anemia 19% (36/192) or there was no risk 40% (77/192) at all. In the case of the recipient, the risks mentioned were infection 45% (86/192) and hyperthermia or chills 35% (67/192). Blood transfusion could be a source of accidents related to blood exposure for 80% of health workers. The prescription of RBCs is related to anemia with signs of clinical intolerance 100% (192) including some cases of acute hemorrhage 20% (38/192). Blood transfusion involves laboratory examinations including blood count and standard ABO and Rhesus blood grouping in pre-transfusion. They were requested in 95% (183/192) of the reported acts. Post-transfusion examinations included hemogram within 72 hours after transfusion 95% (183/192), post-transfusion viral serology, HIV and hepatitis B and C 90 days after transfusion 2% (4/192). Informing the patient in order to obtain their consent was done by 5% (10/192) of the respondents. The improper storage of RBCs 63% (113/180) and the inadequate transportation 21% (40/192) has been reported as causes of blood damage. Hyperthermia with or without chills has been reported by 47% (47/99) of respondents. Transfusion of RBCs was responsible for five adverse events on average per year 92% (91/99) (Figure 1 & 2).

Table 1: Summary of multiple choice questions.

Questions	Answers		No Answer
	Yes n(%)	No n(%)	
Do you think transfusion therapy is common in your department?	192(100%)	0(0)	-
Have you transfused one or more people with anemia during your care activities in the last six months?	162(84%)	30(16%)	-
Do you carry out pre-transfusion documentary checks at the patient's bedside?	112(58%)	80(42%)	-
Do you store RBCs in your department's refrigerator?	75(39%)	117(61%)	-
Do you monitor transfusion at the patient's bedside immediately after placing the RBC?	118(61%)	65(34%)	9(5%)
Have you observed any transfusion incidents/accidents?	99(51,5%)	93(48,5%)	-
Do you return the completed post-transfusion form to the blood bank?	67(35%)	117(61%)	8(4%)

Table 2: Summary of open-ended questions.

Open-ended questions	
a. Risks related to donation/transfusion	What are the risks to the donor? What are the risks to the recipient? What are the risks to the health worker?
b. RBCs Indications	What are the indications of the RBC?
c. Transfusion examinations	Which pre-transfusion examinations do you systematically prescribe? Which post-transfusion examinations do you prescribe upon the transfused patient's discharge? What are the deadlines for the required post-transfusion examinations?
d. Patient' Information	What kind of information do you give the patient before the blood transfusion?
e. Adverse Events	What are the causes of RBCs alteration? What type of adverse events related to the RBCs have you observed in your department? What is the average number of adverse reactions observed in your department per year?

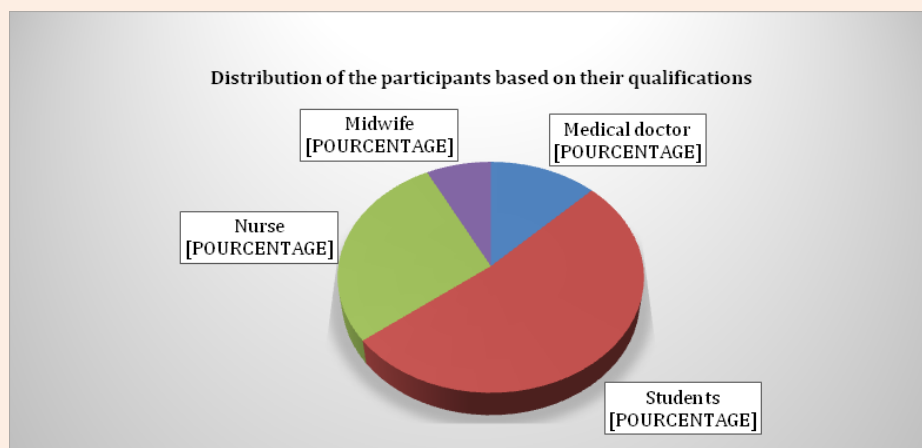


Figure 1: Distribution of the participants based on their qualifications.

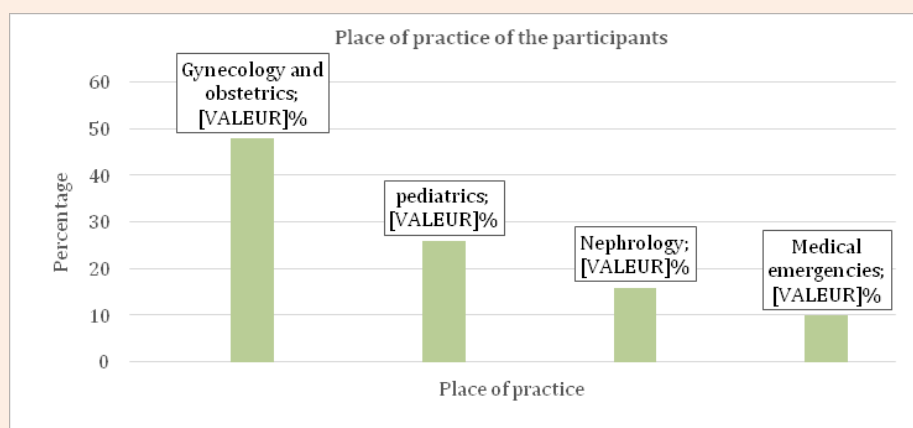


Figure 2: Place of practice of the participants.

Discussion

Health professionals have little time to devote to survey-type studies in the form of an interview. To optimize the number of participants, we chose to conduct an anonymous survey with a self-administered questionnaire. The 64% participation rate can be considered as an acceptable result for the analysis of the results. The distribution of the figures at the level of the qualification of the respondents corresponds approximately to the overall distribution of the health personnel in the university hospitals. Physicians accounted for 12.5% of the study population. This small proportion of physicians is typical of the health systems in developing countries. Indeed, in Burkina Faso in 2012, there was a physician for 21,320 inhabitants [2]. The study shows that blood transfusion is a common practice in clinical departments 100% (192/192), 84% (162/192) had conducted at least one transfusion in the last six months. These figures can be explained by the frequency of anemia that remains a public health problem in Sub-Saharan Africa. With 48% and 26% respectively, departments such as gynecology-obstetrics and pediatrics were the largest users of blood transfusion. The etiologies of anemia are multi factorial but dominated by malaria in the context of Burkina Faso among children and obstetric complications [3,4]. In our study, RBCs are prescribed for acute anemia with signs of clinical intolerance (100%), which confirms that health workers are familiar with the indication of this labile blood product. In contrast, informing the patient to obtain their consent was achieved in only 5% of cases. When blood transfusion is indicated for any treatment, it is necessary to explain the risks and benefits to the patient. Transfusion requires the patient to be systematically informed by the prescriber before performing the procedure whenever possible. This information is an ethical and regulatory obligation whose purpose is to obtain informed consent [5,6].

For 40% of the respondents, there was no risk to the donor. During blood donation, some risks may arise but they have little impact on the health of the donor. Indeed, according to the haemovigilance report of the National Agency for the Safety of Medicines and Health Products, incidents such as syncope, vomiting, or hypotension were of no consequence to the donor [7]. For the majority of participants, conducting HIV and hepatitis B and C viral serology is not part of the post-transfusion biological examinations. Yet, 45% of people reported that infection was a risk incurred by the recipient. Viral serologies are essential parameters for the follow-up of the transfused patient, especially in Africa where the prevalence of these viral infections is high in the general population. According to the Demographic and Health Survey of Burkina Faso, the prevalence of HIV in the general population (15-49 years) was estimated at 1.0% nationally and 2.1% in Ouagadougou. The prevalence rate for hepatitis B and C was 8.8% and 3.5% respectively [8,9]. In addition, with regard to adverse reactions, the following question has been formulated: "What type of adverse events related to the RBCs have you observed in your department?" Hyperthermia with or without chills was reported in 47% (47/99) of the cases. We can then question the respondents' knowledge of the infectious or immunological mechanism of this incident.

Transfusion best practices are based on a set of measures whose primary purpose is to provide health professionals with optimal strategies for enhancing transfusion safety. The ultimate pre-transfusion control that secures the transfusion act involves two essential steps: ultimate control of ABO compatibility and that of concordance. In Burkina Faso, as in most Sub-Saharan African countries, this check of compatibility between the ABO blood group of the patient and that of the RBC using reagents at bedside is not carried out. Administration of an incompatible ABO RBC is one of the most frequent causes of death after transfusion. In the absence of this test, particular emphasis should be placed on the ultimate concordance control step. The verification of the pre-transfusion documentary concordance was carried out by 58% of the participants, including 11% for the verification between the RBC number, the RBC blood group, the identity of the patient and the patient's blood group. Before any transfusion, the identity of the patient must be checked by questioning the patient if possible. In addition, information on issuance sheets and PSLs must also be verified. Indeed, the characteristic of the product and the concordance of the immuno-hematological specificities between the RBC and the patient make it possible to avoid errors.

Immediate monitoring of the transfusion act is essential because it allows the detection of immediate transfusion events that can sometimes be harmful to the patient. If this monitoring was done by 61% of the respondents, it was conducted for less than 5 minutes in 34% of the cases. However, the best blood transfusion practices recommend that transfusion surveillance is performed during the first 10 minutes to detect some immediate incidents. Of our results, 48.5% reported no adverse events. An average of five adverse events per year was observed by 92% of the respondents. In our context, these figures could be explained by the fact that the adverse effects to the transfusion of RBCs were either unknown to health workers or undeclared. The post-transfusion record was returned by 35% of the respondents; whereas the post-transfusion form allows the mandatory reporting of any incidents related to the use of PSLs. This is the fundamental element to ensure traceability and haemovigilance.

In general, the results of our study show that the knowledge and attitudes of health professionals regarding blood transfusion are limited. Few survey respondents (13.5%) had access to continuing training. In Chapter IV of the CNTS 2012 activity report, the second point on the main difficulties encountered by blood transfusion was the insufficiency of continuing training for health workers [10]. This report pointed out that insufficient continuing training was a recurring issue. The 2002/98/EC guideline of the European Parliament and of the Council of 27 January 2003 recognized, on the one hand, that continuing training for health workers is not effective, although necessary and, on the other hand, that it is an essential prerequisite for safe transfusion. This Guideline stipulated that health professionals should be trained periodically and that all staff should meet appropriate qualifications. The lack of continuing training of health workers was especially evident in Africa due to a poorly organized, non-autonomous health system with limited resources [11]. To meet professional development obligations, the upgrading of professional skills should be an integral part of the responsibilities of health facilities. The establishment of continuing training programs and

the development of a reference framework for the evaluation of knowledge, attitudes and professional practices could have a statistically significant impact and thus reduce the risks inherent in blood transfusion. Based on the evidence reported in this study, the establishment of quality indicators would help follow-up the improvement of knowledge and practices and thus encourage staff progress. These indicators should be provided by the CNTS and others shall be set up and monitored in each department or within the hospital by the haemovigilance group.

Conclusion

From the results of this survey, it seems essential to stress that an evaluation of professional practices must be organized on a regular basis. In order to sensitize health professionals on the particular problem of blood transfusion and to improve their knowledge/skills, continuing training of health workers in blood transfusion should be an integral part of the action plans of the medical facilities.

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