

## Emergent Obstetrical Transfusion at the Yalgado Ouédraogo Teaching Hospital

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### Abstract

**Introduction:** In order to improve the hold in charge of the emergencies transfusion we carried out a prospective survey that consisted in describing the epidemiological, clinical, therapeutic and prognostic aspects of maternal transfusion in obstetric service of the teaching hospital Yalgado Ouédraogo.

**Patients and Methods:** This prospective survey was about the period of July 1st to October 31, 2017. All pregnant women or in the post-partum with a need of emergent transfusion are involved.

**Results:** During 4 months 190 women have been admitted for obstetric complication with a need of urgent transfusion of 11.6%. Our patients were young majority (53.1%). The indications of the transfusion were dominated by post-partum hemorrhages (21,6%) with retroplacental hematoma 12.1% and of pregnancies extra uterine broken 8.4%. The stern anemias on pregnancy and in the post-partum represented 21.1% and 24,2% respectively. The hold in charge included an obstetric and/or medical care. The hemoglobin initial means was of  $5.2 \pm 4$  g/dl with extreme 1.5 to 12.1g/dl. The needs of transfusion have not been covered in 13. 2%. Delay of obtaining of the blood product was of  $9.8 \pm 1.4$  hours. The death rate was of 3.2%. Post-partum hemorrhages (PPH) came at the head of the maternal deaths with a specific lethality rate 16%.

**Conclusion:** The rate of need non covered transfusion in emergency remains even important in OS. A better organization is needed to improve blood transfusion.

**Keywords:** *Obstetric Emergency; Blood Transfusion; Maternal Prognosis*

### Introduction

Every pregnant woman is at risk of obstetrical complications that can be fatal to her and/or the fetus. These complications are more frequent in developing countries where they are responsible for high fetal-maternal mortality and morbidity [1]. Direct obstetric emer-

gencies are the leading cause of maternal death, led by hemorrhage [2,3]. According to the World Health Organization (WHO), in 2013, 289,000 women died during or after pregnancy or childbirth. The majority of deaths occurred in low-income countries and a significant proportion could have been prevented [3,4]. Women of reproductive age are major users of labile blood products (LBS) in low-income countries. It is estimated that a quarter of these women die from lack of blood [2]. Haemorrhage is the leading cause of maternal death in developing countries [5].

In sub-Saharan Africa, efforts to reduce maternal mortality have had mixed results. In Burkina Faso, one in 22 women is at risk of dying from pregnancy-related causes [6]. Obstetrical bleeding, particularly in the postpartum, occurs 92 times more frequently in the presence of placental insertion abnormalities and 5 times more frequently under general anaesthesia [7]. In 2014 a study had identified 118 maternal deaths with a 16.1% share of severe obstetric haemorrhage [8]. Emergency management requires blood transfusion. However, blood transfusion centres are often unable to cover the needs of transfusion. These difficulties are related to: the explosion of the HIV pandemic, including blood-borne viral infections such as hepatitis B and C, and the lack of motivation of potential donors. The objective of this study is to describe the epidemiology of obstetrical transfusion emergencies at the Yalgado Ouédraogo University Hospital.

**Patients and Methods**

This study was conducted at the Yalgado Ouédraogo University Hospital in the Obstetrics Department, which has 11 obstetrician-gynecologists, a resuscitation anesthesiologist; 30 nurse anesthetists and assistant surgeons; 35 midwives; 15 nurses; 23 ward boys and girls. This was a cross-sectional study with (July<sup>1</sup> to October 31, 2017) patients received for obstetrical emergency with transfusion indication. The collection technique was interviewing using the collection sheets. Direct observation was also used as an investigative technique. Data were collected from clinical records, health records, LSP application books, delivery and operating room records. The variables studied are socio-demographic characteristics; obstetrical, clinical, biological. The data were entered and analysed using the statistical analysis software EPI info version 7.1.5.

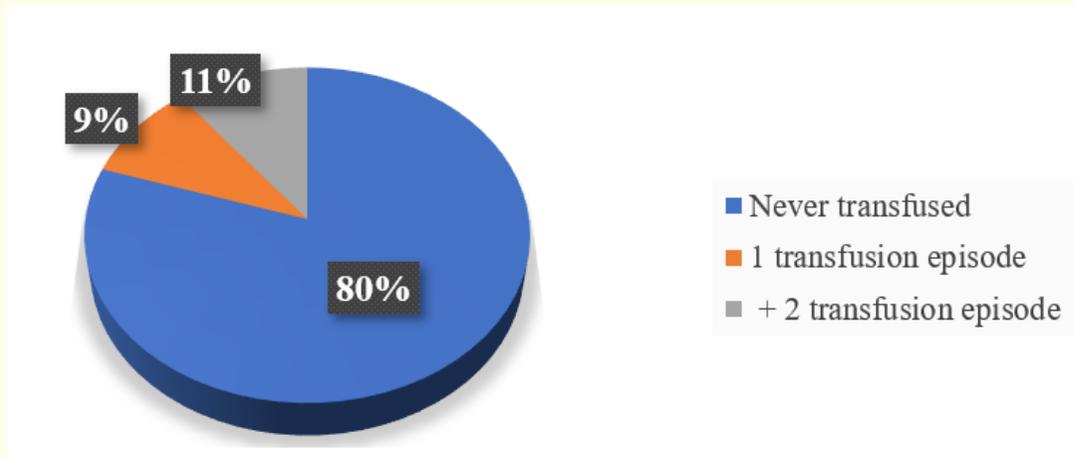
**Results**

Over 04 months of the study, 3381 women were hospitalized in the SO, including 1631 (48.2%) for obstetrical emergencies. Of the 1631, 190 (11.6%) had an obstetrical transfusion emergency. Obstetrical transfusion emergencies accounted for 5.6% of admissions. The mean age was 25.1 ± 6.2 years with extremes of 15 and 42 years. The majority (n = 134 ; 70.5%) were housewives. Among the 190 women, 130 came from a medical centre/medical centre with a surgical unit (MCSA/MC), i.e. 68.40% of the patients. Table 1 shows the distribution of cases according to their origin. Mean patient parity was 2.2 ± 2.1 parities with extremes of 0 and 10.

It was microcytic normochromic anemia in 61 cases (32.1%), normocytic normochromic anemia in 29.5%. The mean pre-transfusion hemoglobin level was 5.2g/dl ± 4.1 with extremes ranging from 1.5 to 12.1 g/dl. A control blood count was done in 74.7% (n=142) with

Provenance	Frequency	Percentage
Center for Health and Social Promotion	18	9.5
Private Clinic	4	2.1
Medical Center/ Medical Center with Surgical Antenna	130	68.4
Regional Hospital Center / University Hospital Center	33	17.4
Coming from home	5	2.6
Total	190	100

**Table 1:** Distribution of patients according to their origin.



**Figure 1:** Previous transfusion history (n = 190).

We found a notion of prior transfusion in 38 patients, i.e. 20%. The indications for transfusion are described in table 2 below.

Obstetrical emergencies	Staff	Percentage
First and second trimester hemorrhages:	27	14.2
Ruptured extrauterine pregnancy	16	8.4
Abortion	11	5.8
Third trimester hemorrhage:	71	37.4
Retroplacental hematoma	23	12.1
Placenta previa	07	03.7
Uterine rupture	06	03.2
Postpartum hemorrhage	41	21.6
Severe anemia:	86	45.3
On pregnancy	40	21.1
Post partum	46	24.2
Total	190	100

**Table 2:** Indications for emergency blood transfusion.

a median post-transfusion hemoglobin level of 6.8g/dl with extremes of 2.8 to 14.6g/dl. In 93.7% (n = 178) there was persistent anemia. Anemia was severe in 74.2% pre-transfusion and 52.1% post-transfusion (Table 3).

At admission the general condition was quite good in 142 women (74.7%), 47 patients (24.7%) had a poor general condition. The clinical signs presented are summarized in table 4.

The 190 patients received a pre-transfusion check-up consisting of Rhesus blood grouping and a blood count. One hundred and eighty-three LSP applications (96.3%) were signed by medical interns. Transfusion was prescribed by inpatients in 96.3% (n=183), residents

Variables	Staff	Percentage
Type of anemia		
Microcytic normochromium anemia	61	32,1
Normocytic anemia normochromium	56	29,5
Microcytic hypochromic anemia	55	28,9
Hypochromatic normocytic anemia	16	8,4
Macrocytic normochromium anemia	2	1,1
Pre-transfusion hemoglobin level		
1-3 g/dl	28	14.7
4-6 g/dl	113	59.5
7-9 g/dl	42	22.1
≥ 11 g/dl	07	3.7
Blood type		
O+	92	48.4
B+	41	21.8
A+	32	16.8
AB+	8	04.2
A-	5	02.6
B-	5	02.6
O-	5	02.6
AB-	2	01
O+	92	48.4
B+	41	21.8
A+	32	16.8
AB+	8	04.2
Post-transfusion hemoglobin level		
1-3 g/dl	04	2.8
4-6 g/dl	70	49.3
7-9 g/dl	56	39.4
≥ 11 g/dl	12	8.5

**Table 3:** Data related to type and severity of anemia (n = 190).

Functional signs	Staff	Percentage
Obnubilation	19	10
Tachycardia	114	60
Low blood pressure	53	27.9
Dyspnea	13	6.8
Vertigo	12	6.3
Cold ends	4	2.1
Asthenia	15	7.9
Pain	20	10.5
Genital bleeding	78	41

**Table 4:** Distribution by clinical signs (n=190).

in 2.6% (n=5) or nurses in 1.1% (n=2). The type of emergency frequently prescribed on blood vouchers was immediate life threatening emergencies with 48.9%. Figure 2 shows the distribution of patients by type of E.

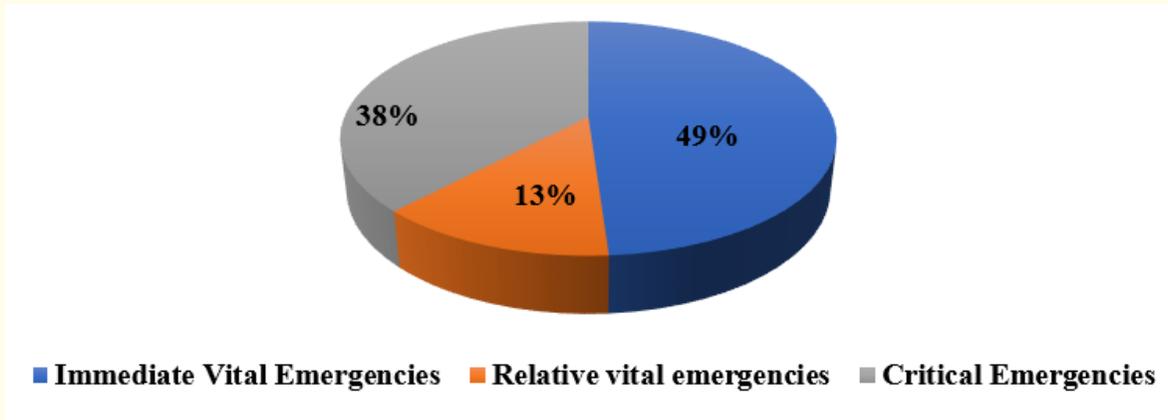


Figure 2: Type of transfusion emergency (n = 190).

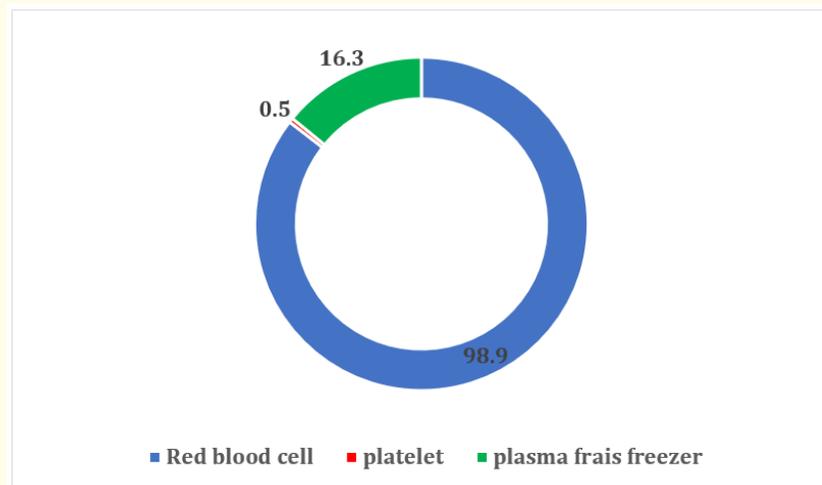


Figure 3: Distribution of patients according to the different products used.

The interns sent 180 blood vouchers, 95% of them. Ten vouchers were passed on by girls/boys in halls (5%). The compatibility test in the patient's bed was carried out in 35 cases, i.e. 18.6%. In 155 cases, i.e. 81.6%, the compatibility test was not carried out. RBCs were transfused in 188 cases, i.e. 98.9%. The distribution of BLPs transfused is shown in table 5. Of the 190 cases of RBC transfusion, 185 cases or 97.4% were iso group and rhesus iso group. Three rhesus-negative A blood grouping patients received RBCs O rhesus-negative. One group O Rhesus positive patient received RBC O Rhesus negative and one group B Rhesus negative patient received RBC O Rhesus negative. All 31 cases of transfusion of FFP were performed according to the plasma compatibility system. One patient received a platelet

Directors of the LSP*	Staff	Percentage
Intern trainee	167	87,9
State midwife	21	11
Residents	2	1,1
Total	190	100

**Table 5:** Distribution of transfusion cases by administrator of bloods products.  
BLP\*: Blood Labile Product.

concentrate. Medical interns were the administrators of the BLPs in 167 cases or 87.9%. The distribution of transfusion cases by BLPs administrator is shown in table 5. The temperature was taken prior to administration of BLP in 16 cases, i.e. 8.42%. In no case were blood pressure, pulse, respiratory rate or heart rate taken.

The median duration of BLP transfusion was 1 hr 24 min with extremes of 16 min 48 s and 6 hr 07 min 48 s. In 91% of the cases, the transfusion was done in less than 3 hours. The median prescription time for pre-transfusion assessments is 11 min with extremes ranging from 0 to 75 min. The median time to receive the pre-transfusion workup was 104.5 min with extremes ranging from 17 min to 20 hours and 25 min. The mean time to transfusion for BLPs was 52.9 min ± 0.6 with extremes of 13.8 min and 3 hours and 42 minutes. The time to RBC was 48 hours in 122 patients or 85.9%; 72 hours in 13 women or 9.16%; 96 hours in 4 patients or 2.8%; and 24 hours in 3 women. Surveillance was observed during the first ten minutes in 28 cases or 14.7%. In 172 cases, or 90.5%, there was no surveillance. During the course of our study, 2 cases of transfusion-related events were reported with a fever type. There was no monitoring of vitals immediately following blood transfusion. Blood products were available in all 190 patients. The mean time to obtain blood products was 9.8 ± 1.4 hours with extremes of 45 minutes and 5 days. Twenty-five patients (13.2%) had not received a blood transfusion before the 24th hour of hospitalization. Thirty-six patients or 19% received oxygen and an indwelling bladder catheter. There were 53 cases or 27.9% of gelofusin-based vascular filling. Medical treatment has been associated with blood transfusion : uterotonic, antibiotic, anti-inflammatory. Among the therapeutic procedures performed, there were 19 cases of salpingectomy, i.e. 23.8%. Table 6 shows the distribution of cases according to the therapeutic procedures performed.

Therapeutic gesture	Staff	Frequency
Salpingectomy/Ruptured extra uterine pregnancy	19	23,8
Other*	18	22,5
Uterine revision	16	20
Emergency Caesarean section	13	16,2
Cervical/Vaginal wall suture	8	10
Hysterectomy	4	5
Artificial delivery	2	2,5
Total	80	100

**Table 6:** Breakdown of cases according to the therapeutic gesture carried out.  
Others\*: Directed delivery (n=9); Artificial rupture of membranes (n=6); Hysterorrhea (n=3).

Two patients were transferred to the multi-purpose intensive care unit. The mean length of stay was 5.8 ± 5 days with extremes from 1 day to 34 days. There was a case of discharge against medical advice. Six patients died (3.2%). Postpartum hemorrhage included 04 cases and 2 cases of PPH.

### Discussion

The obstetrical transfusion rate was 11.6% in this study. Ouédraogo, *et al.* found a rate of 12.4% in a district hospital in the city of Ouagadougou [1]. Bonkougou, *et al.* in 2014 described a transfusion frequency of 7.5% [9]. In Nigeria, Titilola S Akingbola reported an obstetric transfusion rate of 2.2% of which 78.7% were emergencies [5]. 38.7% in Australia [10].

The average age in our series was 25.1 years. Ouédraogo, *et al.* also described an average age comparable to ours (26.1 years) The average age of women was  $30 \pm 5.7$  in Nigeria [5]. Lankoandé, *et al.* found a comparable mean age ( $27.8 \pm 6.9$ ) [1,8]. The population of Burkina Faso is young and the reproductive age corresponds to this age.

Approximately 20% of the women in our series had previously been transfused. In Nigeria, Akingbola [5] described a previous transfusion history in 18.8% comparable to our study. It is described that maternal anemia and the obstetrical setting increase the risk of obstetrical transfusion three times [7]. The indication was required before delivery in 78.4%. This rate is comparable to the data reported in Burkina Faso (63.9%) [8] and India 73% [11]. The main cause of hemorrhage was retroplacental hematoma (HRP) in our 12.1% series versus placenta previa according to other authors [1,11]. The lack of correct obstetrical follow-up, the delay in consultation and management explain the predominance of HRP.

Transfusion was urgent in 87% comparable to the rate (90.5%) described by Bonkougou, *et al.* [9] in the same department in 2014. Pregnancy causes chronic anemia that often decompensates in peripartum, requiring urgent transfusions. Anemia was severe ( $< 7$  g/dL) [12] 74.2% pre-transfusion and 52.1% post-transfusion. The severity of anemia often requires massive or repeated transfusions to improve hemoglobin levels. The lack of labile blood products explains the insufficient therapy to significantly increase the haemoglobin level. This finding has been described by other authors in Burkina Faso [8] and Nigeria (65%) [5].

All women have had a minimum pre-transfusion check-up. One hundred and eighty-three LSP applications (96.3%) were signed by medical interns. Lankoandé, *et al.* [8] had described a similar observation. Interns are the most numerous providers and at the first contact with patients. In association with the care assistants, the interneers assist the doctors in caring for the patients.

Red blood cells (RBCs) were transfused in 98.9%. It was an iso group and iso Rhesus transfusion (97.4%). The 16.3% transfusion of fresh plasma was performed according to plasma compatibility. In Nigeria, whole blood (82.5%), whole blood plus fresh plasma (14%) was used [5] while in India RBM (87.2%) was the most commonly used [11] Several authors described comparable clinical transfusion practice. Bonkougou, *et al.* [9], Ouédraogo, *et al.* [1] and Lankoandé, *et al.* [8]. Cryo-precipitated products have been used by some authors [5,11]. Transfusion monitoring was done according to the rules [12,13].

The average time to obtain blood products was  $9.8 \pm 1.4$  hours. The mean time to transfusion was  $52.9 \text{ min} \pm 0.6$  minutes. In 91% of the cases, the transfusion was done in less than 3 hours. Compared to the definition of urgent transfusion ( $\leq 30$  minute delay) there was a delay in transfusion. The delay in our series is shorter than that described by Bonkougou, *et al.* (313.6 minutes) on transfusions in general. The urgency of our series would explain this short delay. We can therefore say that coding the degree of urgency would have an impact on the speed of supply of blood products.

Monitoring was observed during the first ten minutes in 14.7%. In 90.5% of the cases there was no surveillance. The need for transfusion was not covered in 13.2%. Ouédraogo, *et al.* cited a coverage rate of 84.4% and an incident rate of 2.4% [1]. The procedure for the conduct of transfusion more or less follows the recommandations [14].

A rate of 1% admission to resuscitation, one discharge against medical advice and six cases of death (3.2%) were observed. Lankoandé, *et al.* found an ICU admission rate of 8.2% and an overall mortality rate of 15.6% for severe obstetric haemorrhage [8]. Bonkougou,

*et al.* observed a mortality rate of 2.7% [9]. Ouédraogo, *et al.* reported a mortality rate of 4% in a district hospital in the city of Ouagadougou [1]. The life prognosis of the women on our show was not good. Delays in consultation, diagnosis and management explain these fatal outcomes for some women. Could awareness-raising, capacity-building of agents and policies to promote transfusion not improve the lot of women in urgent need of transfusion?

### Conclusion

Blood transfusion is a common practice in maternity wards and patients for whom emergency blood transfusion is used are young patients. The indication for blood transfusion was a hemorrhage, a poorly tolerated anemia. Postpartum hemorrhages dominate the transfusion indication. Approved blood was the main alternative. There was a delay in the transfusion.

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