

Acute Blood Transfusion Reactions in Pregnancy, an Observational Study from North Eastern Nigeria

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Abstract

Blood transfusion is one of the key interventions in emergency obstetrics care and is known to save lives, however complications do occur. Pregnancy has certain peculiarities, which includes physiological changes, development of antigens against red cells, leucocytes and platelets. History of previous transfusion is common in pregnancy. The aim of this study is to find the incidence, presentations, types and risk factors for developing acute transfusions reaction in pregnancy.

Materials and methods: Retrospective study of all blood transfusions in pregnancy between January to December 2012 at Federal Medical Centre Azare, Nigeria.

Results: 1602 pregnant women received blood transfusion out of 15213, given a transfusion rate of 10.5% the mean age and parity were 28.3 ± 4.2 years and 6 ± 1 respectively.

Acute reactions were found in 26.3%. Non hemolytic febrile reaction accounts for 47.7%. Allergic urticaria account for 24.5%.

There was a significant relationship between stored blood and transfusion reactions, similarly, significant relationship was found between previous history of transfusion and transfusion reactions, but no difference was found between rise and full cross match and uncross match but ABO compatible blood in developing transfusion reactions.

Conclusions: As blood transfusion alternatives are not readily available or not practical in pregnancy hemovigilance is the key to making blood transfusion safer.

Keywords: Acute transfusion reactions; Pregnancy

Introduction

Blood transfusion is an important intervention in the management of pregnancy complications in sub-Saharan Africa, where Anaemia, Sepsis, Obstetrics heamorrhage, obstructed labour and complications of abortions are common. Blood may be life saving and therefore, recommended as a life saving measure to reduce maternal deaths [1]. Complications of blood transfusion are well known, they may be classified based on time of onset as acute or delayed or based on etiology – Immunological or non Immunological.

Studies have shown that up to 20% of transfusion may result in some complications [2], most of these studies are conducted in non pregnant subjects but pregnancy poses a special challenge as immune response in pregnancy is different from the non pregnant state and this may possibly affect the nature or onset of complications, as pregnancy is known to cause formation of red cells allo antibodies [3].

Advances in transfusion medicine, coupled with availability of blood products substitutes had help in reducing transfusion rates in the western world but such cannot be said to be true in Africa where rates up to 37% in obstetrics emergencies have been reported [4].

North Eastern Nigeria has the highest maternal mortality ratio in the country with figures upto 1700/100,000 live births [5]. Obstetrics complications are common and so is blood transfusion, but studies on blood transfusion in general and specifics such as acute blood transfusion reactions in pregnancy are rare. Therefore the aim of this study is to determine the incidence, types, clinical presentation and risk factors for acute transfusion reactions in pregnancy.

Materials and Methods

The study was conducted over a period of 12 months from January to December, 2012 at Federal Medical Centre, Azare. A sub-urban town in North Eastern Nigeria, the hospital is a tertiary health institution serving a population of nearly 3 million people. All pregnant women that were transfused during the period were included in the study. Retrospective analysis of their case records both in the obstetrics and laboratory department of the hospital was carried out. Data relating to age, parity, indication for transfusion, numbers of the units transfused, duration of blood storage, adverse reactions and laboratory analysis result following an adverse reaction were collected. The results were analyzed using SPSS Version 16.

Sixteen cases were excluded as the symptoms they developed were not attributed to the transfusions. The study was approved by the hospital ethical committee.

Results

15213 pregnant women were seen during the period under review

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and 1602 cases were transfused given a transfusion rate of 10.5%. The mean age of the women who were transfused was 28.3 ± 4.2 years, and the mean parity was 6 ± 1 . Abruptio placenta and placenta prevea were the commonest indication for transfusion constituting 37.2% and 20.5% respectively (Table 1).

Acute reactions were seen in 421 patients (26.3%) most of the complications are mild with no record of fatalities (Table 2). The commonest is non heamolytic febrile reaction 47.7%, followed by Allergic Uticaria (24.5%). A statistically significant difference exist between stored blood >24 hours and unstored blood less than 24 hours, as only 5 out of 142 patient that received unstored (fresh) blood reacted as against 216 reactions from 1460 stored blood (Odd ratio 10.92, $p < 0.00001$, CI 95%).

Women who had previous history of transfusion are susceptible to react to blood transfusion as against those that had no previous history of blood transfusion, as a statistically significant difference was found among the 221 out of 646 who reacted (history of previous transfusion) as against 200 out of 956 who reacted among women that had no previous history of transfusion (Odd ratio 1.97, CI 95%, $p < 0.0001$).

There is no statistical difference between a blood that was cross match fully for 2 hours as against uncross match but same ABO blood group or cross match blood for less than 2 hours (Table 3).

Multigravidae are more likely to develop acute transfusion reaction than primigravidae (Table 4). Four patients had received massive blood transfusion (replacement of their total blood volume within 24 hours) and two of them have manifested acute transfusion reactions.

Discussion

Despite the clamour to reduce the rate of blood transfusion on one hand, there is a greater need to treat obstetrics emergencies so as to reduce maternal morbidity and mortality, and blood is one of the essential tools especially in sub-Saharan Africa. Therefore, at the moment, the choice is to make blood transfusion safer, and some of the ways of doing so is through haemovigilance so as prevent, identify reports and treat reactions where they occur [6]. Blood transfusion

S/№	Indications	№.	(%)
1	Abruptio Placenta	597	37.2
2	Placenta Prevea	328	20.5
3	Severe Anaemia	284	17.7
4	Uterine Atony	150	9.4
5	Complications of Abortions	102	6.4
6	Ruptured Uterus	70	4.4
7	Sepsis	45	2.8
8	Others	26	1.6
Total		1602	100

Table 1: Abruptio placenta and placenta prevea were the commonest indication for transfusion constituting 37.2% and 20.5% respectively

S/№	Reactions	№.	(%)
1	non heamolytic febrile reaction	201	47.7
2	Allergic Uticaria.	103	24.5
3	Acute heamolytic Reaction	49	11.6
4	Volume overload	38	9.0
5	hypotension	21	4.9
6	Allergic anaplylaxis	9	2.1
Total		421	100

Table 2: Acute reactions were seen in 421 patients (26.3%) most of the complications are mild with no record of fatalities

	Reaction	No reaction
Full Crossmatch	326	1092
Uncross match/Not Full Cross Match	95	89
Total	421	1181

Odd ratio 3.58, CI 95%, $p = 1.0000$.

Table 3: There is no statistical difference between a blood that was cross match fully for 2 hours as against uncross match but same ABO blood group or cross match blood for less than 2 hours

Parity	Reactions	No reaction
Primip	78	286
Multip	343	895
Total	421	1181

Odd ratio 0.71, X^2 5.40, CI = 95% $p < 0.05$

Table 4: Multigravidae are more likely to develop acute transfusion reaction than primigravidae

rate in the study population is 10.5% which is higher than the 6% reported for United Kingdom [7]. Blood transfusion rate of 37% have been reported for obstetrics emergencies in developing countries. Acute transfusion reactions were seen in 421 patients (26.3%) which is higher than the 20% reported in the literature [2]. This may be because the study population is homogenous (Pregnant) with peculiar characteristics such as physiological changes in pregnancy which may affect immunity, previous history of blood transfusion in addition to effect of the loss of blood which necessitated the transfusion.

Multiparous women may form alloantibodies to leukocyte, red cells or platelet antigens as a result of an overt or inapparent fetal – maternal heammorrhage. Women who form leukocyte antibodies following pregnancy are more likely to have febrile non hemolytic transfusion reactions if subsequently transfused with leukocyte containing blood components [8]. 86% of the subjects in this study are multiparous.

Like in the general population, febrile nonhemolytic transfusion reactions (FNHTR) are more common than acute allergic reactions (AAR) [9,10]. In this study FNHTR account for 47.7% while AAR account for 11.6%.

Multigravidity is a risk factor as against primigravidity (Table 4), presumably, due to sensitization and subsequent formation of antibodies resulting from fetomaternal transfusion that may occur in previous pregnancies.

In the study centre, Obstetrics emergencies are common, and the tendency to have shortage of blood is not uncommon, therefore transfusion of uncross match blood or sub cross match ABO compatible blood (30 minutes to 1 hour instead of 2 hours) cross match is practiced. No statistical difference was found between the two groups (Table 3) which means that in extreme emergencies, such practice may continue.

There is a statistically significant relationship in developing transfusion reactions between pregnant women with previous history of transfusion and those without (see result above), this is similar to what was reported in Kano, North Western, Maiduguri, North Eastern and Ife, South Western Nigeria [11-13].

Blood banking is crucial in blood transfusion services, and a lot has been said about stored blood and its possible effects which include depletion of clotting factors and development of transfusion reaction [11,14]. The longer the length of storage, the higher the risk of reaction, which was also found in our study to be statistically significant. In the present study, only whole blood and packed cells were transfused, as we don't have facilities that segregate the different components of the

blood, which may also increase the rate of the reactions. Transfusion related lung injury (TRALI) was not seen in this study probably it was not recognized [15].

Conclusion

Blood transfusion rate is high because alternatives are either not available or not practical to use in pregnancy.

Alternatives to blood transfusions such as autologous blood transfusion may not be practical in obstetrics emergencies [16,17]. Cell salvage machine is not available, others like Erythropoietin, purified or recombinant hemoglobin or perflourocabons are generally not available in poor resource settings, and therefore blood may be the only option where transfusion is indicated.

Acute transfusion reactions are common resulting from many factors such as physiology of pregnancy, high incidence of obstetrics complications requiring multiple and recurrent transfusions. There is a need for governments and nongovernmental organizations to provide transfusion alternatives at affordable rates, but more important is poverty eradication, women empowerment, availability of skilled health worker at delivery, female education etc. These will empower the pregnant mothers to seek medical help early so as to avoid blood transfusion and its complications. In dire emergency transfusion of uncross match ABO compatible blood may be life serving and where possible, avoidance of stored blood should be the practiced.

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