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Full Length Research Paper

The Effect of Previous Abortion on the Formation of Alloantibody among Women in a Tertiary Hospital, Sokoto, in North Western Nigeria

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Abortion is a global problem and a leading cause of maternal morbidity and mortality in the developing countries. It is associated with many complications. This study was carried out to determine the effect of history of previous abortion on a "hidden" complication – the formation of alloantibodies. One hundred and fifty three (153) women who required a red cell transfusion were recruited by convenience sampling. The age range was 18 – 70 years with mean age of 29.97±9.724 years. Three milliliters of whole blood was collected from each patient into an EDTA anticoagulated tube. The plasma sample was used to screen for the presence of clinically significant alloantibodies by Ortho Biovue system cassettes (AHG/Coombs) technique using the Lorne Laboratories of UK antibody screen cells and panel cells following manufacturer's instructions. Among those recruited, 64(42.5%) of the women had at least one history of previous abortion. The study reported that abortion was highest in ages 21 – 40 years. The overall prevalence of alloantibody was 25(16.3%). The effect of number of abortions and abortion status on the formation of alloantibodies indicated a statistical significant relationship (*P* = 0.008 and 0.017 respectively). The Odd ratio was found to be 2.87 with *P* value of 0.021. It was reported that age range of 21 – 40 years had the highest prevalence of alloantibodies formation corresponding to the age range with the highest abortion rate, however, there was no statistically significant relationship between age and the development of alloantibodies, (*P* = 0.114). This study showed that the complications from abortion which is asymptomatic and constitute the "hidden" complications is high. This may present serious consequences on these women who are positive for alloantibodies by complicating transfusion therapy and pregnancy outcome.

Keywords: Previous abortion, Red cell, Transfusion, Alloantibodies, Sokoto, Nigeria.

INTRODUCTION

Abortion has harmful consequences on women especially when it is an unsafe abortions. Such procedures can endanger women's reproductive health and lead to life-threatening complications (Mitsunaga *et al.,* 2005). In Nigerian the number of women who die each year from unsafe abortion procedures was estimated to be 34,000 deaths annually (Niyi, 2015) in about 1.25 million abortions that occurred yearly (Akinrinola *et al*., 2015). However it was reported in West Africa that the overall, unsafe abortion accounts for about 10% of all maternal deaths (WHO, 2004). Unsafe abortions often put women's life and health in jeopardy, with 25% of women who underwent abortions experience serious complications (Bankole *et al.,* 2006). Complications of abortion may include the followings: haemorrhage, abdominal pain, abdominal distension, vaginal discharge, septicaemia and pelvic abscess and cervical lacerations among others. There is paucity of data on the "hidden" complications associated with red cell isoimmunisation

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among women who had abortion.

Red blood cell alloimmunization results from genetic disparity of red cell antigens between donor and recipients or between a pregnant woman and the foetus. Alloimmunizations are the most important complication especially when it involves clinically significant alloantibodies; these alloantibodies can cause haemolytic transfusion reaction (HTR), haemolytic disease of the foetus and newborn (HDFN) in pregnancy and in transplantation, it may raise the risk of haemolytic reactions, delayed engraftment and pure RBC aplasia (Xu *et al.,* 2014).

Transplacental or fetomaternal haemorrhage (FMH) can occur during pregnancy, abortion or at delivery (Katiyar *et al.,* (2007) and Johnson *et al.,* 1995), and may lead to immunization to the D antigen or any clinically significant antigen if the mother is exposed to foetus red cells containing an antigen which she lacks. This can result in haemolytic disease of the foetus and new-born (HDFN) in positive pregnancies for the D antigen or any clinically significant antigen (Erhabor *et al.,* 2013). This study was carried out to determine the effect of previous history of abortion on the prevalence of alloantibodies among women with indication for red cell transfusion.

MATERIALS AND METHOD

The study was a cross-sectional descriptive study to find the effect of history of previous abortion on the formation of alloantibodies among women requiring a red cell transfusion.

We recruited 153 women in whom a red cell transfusion was indicated by convenience in this present study. Three (3ml) milliliters of whole blood was collected from each subject into an EDTA - anticoagulated tubes. The red cell was collected and typed for M antigen using potent antisera from Lorne Laboratory UK while the plasma sample was used to screen for the presence of clinically significant alloantibodies by Ortho Biovue system cassettes (AHG/Coombs) semi-automated technique using the Lorne Laboratories of UK antibody screening cells and panel cells.

Selection criteria

Ethical clearance was obtained from the ethical committee of the Specialist hospitals, Sokoto. While written informed consent was sought from all participants in this study. All consenting women in whom a red cell transfusion was indicated were eligible for recruitment into the study. All non-consenting women, women in whom red cell transfusion was not indicated and Male patients were all excluded in the study.

Data analysis

The history of previous abortion was taken using a pre validated structured questionnaire administered to women that had indication for red cell transfusion in a tertiary hospital to determine the effect of abortion on the prevalence of alloantibodies among them. The data obtained were presented in tabular forms and in proportions as the case may be, and Hypothesis was tested with statistical software (SPSS version 20) at 0.05 significant levels and 95% confidence using the Person Chi-square test.

RESULTS

The study reported that 42.5% of the women had at least one abortion in their life time. We also found that abortion is highest in 21 – 40 age range as shown in figure 1. The study also reported an overall prevalence of alloantibody of 16.3% and also that the prevalence of alloantibodies is highest among ages 21 – 40 years, this also correspond to the age group in which the abortion rate is high as indicated in figure 1 and table 3 below. Table 1 showed the prevalence of alloantibodies in various numbers of times abortion occurred; it indicated a significant effect of abortion on the formation of alloantibodies. P = 0.008. Table 2 showed the prevalence of alloantibodies by abortion status, it indicated a significant effect of abortion on the formation of alloantibodies. P = 0.017. The Odd ratio was found to be 2.87. Table 3 showed the prevalence of alloantibodies according to age groups, it indicated an insignificant effect of age groups on the formation of alloantibodies. P = 0.114. However, age range of 21 – 40 years showed the highest prevalence of alloantibodies formation.

The table 1 below showed the prevalence of alloantibodies in relation to the number of times abortion occurred, it indicated a significant effect of abortion on the formation of alloantibodies. P = 0.008. X^2 = critical value of chi-square and df = degree of freedom.

The table 2 below showed the prevalence of alloantibodies by abortion status, it indicated a significant effect of abortion on the formation of alloantibodies. P= 0.017.The Odd Ratio was found to be 2.87. X^2 = critical value of chi-square and df = degree of freedom.

The table 3 below showed the prevalence of alloantibodies according to age groups, it indicated aninsignificant effect of age groups on the formation of alloantibodies. P = 0.114. However, age range from 21 –

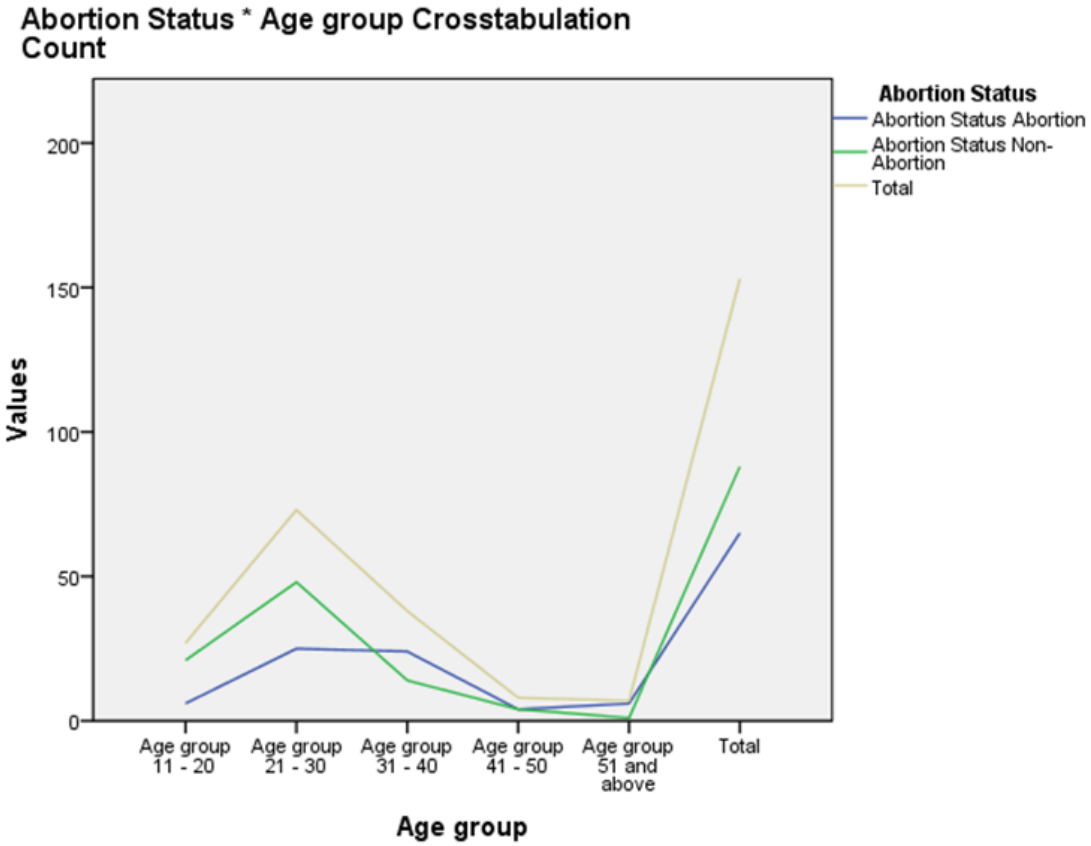

Figure 1. Prevalence of previous history of abortion among women requiring transfusion by age group.

Table 1. Prevalence of alloantibodies among women requiring red cell transfusion by number of previous abortion

	Alloantibody					
No. of abortions	**Positive**	**Negative**	**Total (%)**	**X^2**	**df**	**p-value**
0	5.9	52.9	58.8	15.623	5	0.008
1	5.2	19.6	24.8			
2	3.9	10.5	14.4			
3	0.0	0.7	0.7			
6	0.7	0.0	0.7			
7	0.7	0.0	0.7			
Total	16.3	83.7	100.0			

Table 2. Prevalence of alloantibodies among women requiring red cell transfusion according to abortion status

Abortion	**Alloantibody**					
Status	**Positive**	**Negative**	**Total (%)**	**X^2**	**df**	**p-value**
Abortion	10.5	32.0	42.5	5.662	1	0.017
Non-abortion	5.9	51.6	57.5			
Total	16.3	83.7	100.0			

Table 3. Prevalence of alloantibodies among women requiring red cell transfusion according to age groups

	Alloantibody					
Age group	**Positive**	**Negative**	**Total (%)**	**X^2**	**df**	**p-value**
≤20	0.7	17.0	17.6	7.459	4	0.114
21-30	7.8	39.9	47.7			
31-40	5.2	19.6	24.8			
41-50	0.7	4.6	5.2			
≥51	2.0	2.6	4.6			
Total	16.3	83.7	100.0			

40 years shows the highest prevalence of alloantibodies formation. X^2 = critical value of chi-square and df = degree of freedom.

DISCUSSION

The study reported that 42.5% out of one hundred and fifty three (153) women had at least one abortion in their life time. The result of the study showed that abortion was highest in ages 21 to 40 range. It is difficult to ascertain the exact prevalence of abortion in Nigeria because of so many reasons which include among others: absent of proper documentation, most of the abortions are done clandestinely and by quacks and some abortions are done by the women themselves. It was reported that Nigerian women do not want a pregnancy because varying reasons which also vary with their life circumstances: some was because of young age, some educational career, are single while others is child spacing (Alan Guttmacher Institute, 2003).

It was also reported that unwanted pregnancy reflects the broader context of Nigerian society and women's lives. Hussain *et al.,* (2005) observed that sexual activity outside of marriage has increased as women stay in school longer and marry later, heightening the risk of out-of-wedlock pregnancies, many of which are unwanted. Feyisetan and Bankole, (2002) has shown that growing urbanization, the increasing participation of women in the paid labor force and the diminishing ability of families to support many children (partly because of the costs of educating them) all lead to a desire for somewhat smaller families and in the absence of contraception, the fewer children couples desire, the higher the proportion of pregnancies that are unwanted.

In this study it was observed that an overall prevalence of alloantibody was 16.3%, this indicates that the "silent" complication of abortion was high. Reports from other researchers indicated a high prevalence among transfusion dependent patients as in sickle cell disease and thalassaemia (Bashawari, (2007), Davies and Olatunji, (1995) and Hemchandra *et al*., 2014). Our observed prevalence was however at variance with previous report by Jeremiah *et al.* (2011) in which alloantibodies were identified in the serum of 3.4% of pregnant women studied. Natukunda *et al.* (2010) also reported a lower prevalence, in their work involving a total of 214 transfused Ugandans observed that 6.1% of subjects possessed red blood cell alloantibodies whose specificities included anti-E, anti-S, anti-D, anti -K and anti –Le (a). The antenatal screening of 3,000 patients in Zimbabwe indicated an overall antibody incidence of 1.7% (Koelewijn *et al.,* 2009).

In this study, it was also observed that the abortion status affects the prevalence of alloantibodies significantly ($p = 0.017$), but the prevalence of alloantibodies formation was found to be strongly related to the number of abortions in a woman ($P = 0.008$). We calculated the Odd ratio and was found to be 2.87. This indicates that for every 10 abortions 3 would develop a "silent" complication of the formation of alloantibodies. Alloantibodies can complicates transfusion therapy and pregnancy in these women, we therefore advocate for routine antenatal alloantibody screen for early management of alloantibodies positive pregnancies.

Miscarriage is the spontaneous expulsion of the foetus before the age of foetal viability. Threatened miscarriage is the most common complication of early pregnancy. It was reported that approximately 4% of women who have a therapeutic or complete miscarriage will have a trans placental haemorrhage of > 0.2 millilitres of foetal red cells and of these patients, 4% - 5% will become sensitized having introduced to foetal antigen which the mother may lacks (Lee *et al*., 1999). Bowman, (1988) has shown in his report that sensitization can occur in up to 3% of Rhesus negative women exposed to a trans placental haemorrhage involving as low as < 0.1 ml of Rh positive foetal red cells.Observational studies in random patients, who most often receive incidental transfusions, and pregnant women, has an estimated antibody prevalence between less than 1 to 3 percent, but prospective systematic studies and studies in multitransfused patients reported on an up to over 70 percent alloimmunization incidence (Olujohungbe *et al.,* 2001; Winters *et al.,* 2001).

The study revealed that the prevalence of alloantibodies among this study population was highest between ages 21 – 40, this also correspond to the age group in which the abortion rate was high. This age group is the sexually active age and may probably account for high abortion rate and high prevalence of alloantibodies. Seyfried and Walewska, (1985); reported the probability of alloimmunization is a quadratic function of age and the formation of red cell antibodies may be influenced by the patients' age at which the transfusions occur.

CONCLUSION

The complications from abortion, which is often not presented and constitute the "hidden" complications was high and present a serious consequences for the women when transfusion is required and to the future foetus as in the case of haemolytic disease of the foetus and new-born (HDFN).

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