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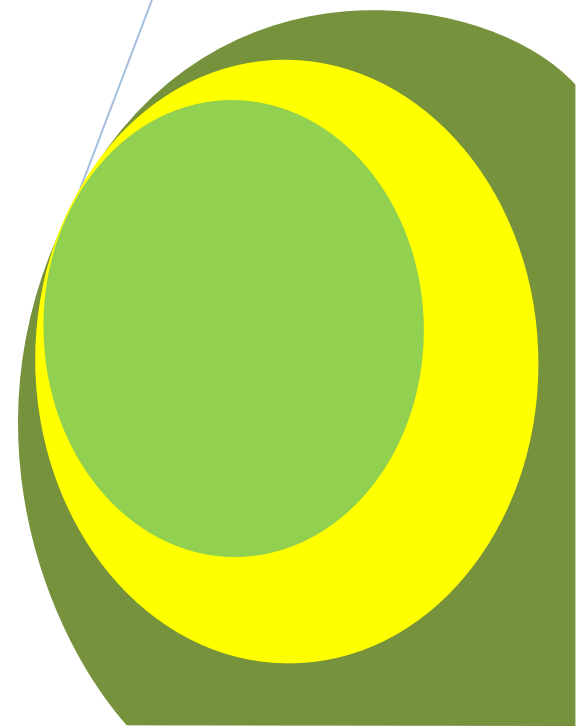
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Assessing Expectant Mothers' Knowledge and Practices Regarding Maternal-Fetal Blood Incompatibility: Evidence from Ogun State, Nigeria

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Assessing Expectant Mothers' Knowledge and Practices Regarding Maternal-Fetal Blood Incompatibility: Evidence from Ogun State, Nigeria

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ABSTRACT

Background: Studies revealed that much of the high infant mortality is related to problems in early infancy such as maternal-fetal blood incompatibility. The study investigated knowledge and practice of expectant mothers about maternal-fetal blood incompatibility at Olabisi Onabanjo University Teaching Hospital in Ogun state.

Methods: Data was collected from 94 women purposively selected for the study between August and September 2014. Both descriptive statistics and Logit regression analysis were used to analyze data (using statistical package for social sciences, version 17).

Results: Result findings showed that the level of knowledge of maternal-fetal blood incompatibility of the expectant mothers was low (with only 39% correct response) and barely average of 56% for positive attitudes. Only 42% of the respondents have ever done the test. The regression result showed that the age of the pregnant women, income and knowledge level as well as number of previous births were the significant variables influencing uptake of maternal-fetal blood incompatibility test.

Conclusions: The study recommends the need for creating more awareness and conducting appropriate intervention that addresses the gap in knowledge as highlighted in the study. This is to corroborate the health information these women receive from the clinic.

Keywords: Knowledge, Attitude, Practice, Expectant Mothers, Maternal-fetal blood incompatibility test, Nigeria.

INTRODUCTION

Despite the introduction of Rhesus (Rh) immunoglobulin in 1968, hemolytic disease of newborn remains a serious concern (Mulinare, Murki, Narang and Dutta, 2011). It was reported that immunoglobulin prophylaxis does not eradicate hemolytic disease of the fetus in the newborn and it is estimated that there is an incidence of 10.6 cases per 10,000 deliveries of hemolytic disease of newborn worldwide with geographic variations (Chavez, Mulinare and Edmonds, 2011). Race and Sanger (2005) reported that when an RhD negative mother is exposed to the RhD positive red cells (usually as transplacental haemorrhage), the client develops allo-anti-D which cross the placenta and results in the destruction of fetal red cells. The clinical manifestations of RhD hemolytic disease range from asymptomatic mild anemia to hydrops fetalis or stillbirth associated with severe anemia and jaundice. Furthermore, it was observed that hemolytic disease of newborn was a significant cause of fetal mortality and morbidity until the introduction of amniocentesis, intrauterine transfusion, and exchange transfusion in the management of severely allo-immunised women and their fetuses.

Rh iso-immunization still contributes to the neonatal morbidity and mortality in the world due to non-immunization, under-immunization, and false Rh typing in rare cases (Holburn and Prior, 2006). When maternal sensitization to the D antigen is present, it is important to establish the paternal zygosity (Holburn and Prior, 2006). It was reported that in the white population, the incidence of heterozygosity for the D antigen is 56% (Race and Sanger, 2005). The author added that in such cases of paternal heterozygosity, only 50% of the fetuses will be potentially at risk for iso-immunization. Therefore, by establishing the paternal zygosity, improved counseling of couples concerning risks and treatment options can be provided. Furthermore, if paternal homozygosity is confirmed, the

need for invasive procedures to diagnose fetal blood type may be obviated (Holburn and Prior 2006). Fetal-maternal hemorrhage exposes the mother to foreign red cell antigens, which can lead to an immune response in the mother. Previous maternal transfusion can also lead to the development of subsequent hemolytic disease of the newborn. Although more than 60 antigens can cause hemolytic disease of newborn, the most common cause is Rh sensitization (Holburn and Prior 2006). Hemolytic disease of the newborn can also be caused by less common atypical antibodies, which can cross the placenta and affect the fetus in a similar fashion (Berkowitz, Beyth and Sadovsky, 2003). Severe fetal disease due to these atypical antibodies is said to be rare. A combined incidence of severe fetal disease of 0.1% to 2% has been reported (Solola, Sibai, & Mason, 2008).

Rh incompatibility was seen in 8% women who were either primiparous or had delivered a child in the past (Sadia, Ayaz, and Anjum 2011). According to Fikree, Karim, Midhet and Berendes (2012), Knowledge about blood groups and Rh incompatibility and its complications during pregnancy and after child birth was very low despite the fact that it is cheap and easy to detect Rh negativity during pregnancy (Fikree et al, 2012). In addition, Fikree, et al. (2012) reported that in Africa, maternal mortality rate is 500 per 100,000 births resulting in the death of nearly 25,000 women each year due to pregnancy related complications (Fikree et al., 2012). Presently, the statistics is still the same. According to WHO, the incidence and complications due to Rh incompatibility vary in different parts of the world and the low incidence of Rh negativity often leads to the neglect of rhesus incompatibility in many parts of Asia. The reproductive risk of Rh negative women in Africa is three times that of non-African women and this shows that it is a problem.

In Nigeria, infant mortality rate is 84/1000 births. Much of this high infant mortality is related to problems in early infancy and maternal health including high rates of fertility and large family size (UNICEF, 2011). Rh incompatibility usually happens in the second and subsequent pregnancies, so the risk of having Rh incompatibility also increases with the increasing family size. Previous study has shown that blood incompatibility is a major cause of jaundice (Memon, 2006).

This study assessed the knowledge and practice of expectant mothers about maternal-fetal blood incompatibility at Olabisi Onabanjo University Teaching Hospital in Ogun State. Not many studies have assessed the knowledge and practice of maternal-fetal blood incompatibility among expectant mothers, thus this study forms an important contribution to the body of knowledge.

METHODOLOGY

This study was carried out in Olabisi Onabanjo University Teaching hospital, Ogun state Nigeria. It is located in Sagamu, a suburban town with a population of 50,000 (2006 census). The hospital is a tertiary care facility. The target respondents were the expectant mothers, who attended Olabisi Onabanjo University Teaching Hospital between August and September, 2013. They were 100 in number. The instrument used to collect data was a questionnaire, structured along the research questions. Most questions were derived from existing knowledge and practice of expectant mothers about maternal fetal blood incompatibility. One hundred copies of the questionnaire were administered out of which 94 were found useful for data analysis (94% return rate).

The research instrument was subjected to reliability test to establish its internal consistency. The result of the analysis shows that the Cronbach's alpha value for the instrument was 0.72. Items of an instrument were considered to represent a measure of high internal consistency if the total Cronbach's alpha value was more than 0.7 (Graham and Gisi, 2008). Data gathered using the questionnaire were analyzed and the results presented in Tables.

The logit regression model was employed to examine the factors that influence respondents' uptake of the maternal-fetal blood incompatibility test. The model is specified as follows:

$$\ln \left(\frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1 X_1 + \dots + \beta_{14} X_{14} + e_i \dots \dots \text{Gujarati (1998)}$$

The dependent variable is the natural log of the probability of uptake of the maternal-fetal blood incompatibility test. (P_i) divided by the probability of non-uptake ($1-P_i$), β_0 = the intercept, $\beta_{1...14}$ = regression coefficients, $X_{1...14}$ = independent variables, and e_i = error term.

The independent variables specified as factors affecting the uptake of the maternal-fetal blood incompatibility test, are defined below:

- X_1 = Age (years)
- X_2 = Income level per month (₦)
- X_3 = Educational level (years)
- X_4 = knowledge level
- X_5 = Attitude

X_6 = Frequencies of malaria attack per year

The Statistical package for social sciences (17th editions) was used for all data analysis. Ethical clearance was obtained from the Babcock University Health Research Ethics Committee before commencement of the survey. Furthermore, informed consent forms were also attached to the questionnaires where the respondents indicated their willingness to participate in the study by signing after reading the terms and conditions that applied to the study.

RESULTS AND DISCUSSION

The results of the data analysis for this study are presented in this section. The result of respondents' socio-demographic characteristics, knowledge, attitude and practices, with respect to maternal-fetal blood incompatibility test are presented here.

Respondents' personal characteristics

Respondents' personal attributes analyzed included age of mother and child, marital status, level of education, occupation type, and frequency of maternal-fetal blood incompatibility test. The results, as presented in Table 1, showed that most of the respondents were Yorubas (44%), between 21 and 30 years old (50%) and mostly civil servants (51%). By implication, most of these women, being young, are expected to be new to child bearing and nursing, however, further result showed that 50 percent of the women have had up to 2 previous births. This shows the likely existence of early marriage and child bearing in the study area. Most of respondents were literate with 80 percent having secondary education and above. The nexus between education and health seeking behaviour has been detailed in previous studies (Uzochukwu et al., 2013; Babalola et al., 2013; Kio et al., 2016). Thus their level of education is expected to influence their search for knowledge, attitude and practices regarding maternal-fetal blood incompatibility test. Since most of the women are civil servants, they may not necessarily depend solely on their husbands for household financial sustenance and their immediate medical care. Most the respondents were Christians (54%). This may influence their attitude towards preventive healthcare.

Table 1: Frequency Distribution of Socio-Demographic Data

Variable	Description	Frequency (N = 94)	Percentage
Age	16-20yrs	11	11.7
	21-30yrs	47	50.0
	31-40yrs	34	36.2
	41 and Above	2	2.1
Ethnicity	Yoruba	41	43.6
	Igbo	25	26.6
	Hausa	18	19.1
	Others	10	10.6
Religion	Christianity	51	54.3
	Islamic	28	29.8
	Traditionalist	11	11.7
	Others	4	4.3
level of education	Primary	19	20.2
	Secondary	33	35.1
	Tertiary	42	44.7
Occupation	Merchant	31	33.0
	Civil Servant	48	51.1
	Housewife	15	16.0
Monthly Income level (₦)	≤20,000	11	11.7
	20,001-30,000	18	19.2
	30,001-40,000	27	28.7
	40,001-50,000	24	25.5
	>50,000	14	14.9
Parity	1	2	2.1
	2	47	50.0
	3	32	34.0
	4 and above	13	13.8

Source: Computed from field Survey (2014)

Respondents' knowledge of Maternal-fetal blood incompatibility

Respondents' knowledge regarding maternal-fetal blood incompatibility and test were assessed and the results presented in Table 2. Levels of knowledge were measured following the Ashur(1977) measurement scale. According to Ashur, proportion or score less than 40 percent of correct response should be taken as indicator of low level of knowledge, 40 – 59 percent is considered average and 60 – 80 per cent is considered high, while over 80 per cent is regarded as very high level of knowledge.

The results in Table 2 showed that a good percentage of the women knew their own blood group (53%) and their spouses' blood group (50%). This finding is consistent with that of Sadia, Ayaz, and Anjum (2011). Some 67 percent opined that Rhesus factor investigation should be done before marriage, hence before conception. However, the overall result showed that the women had low level of knowledge regarding maternal-fetal blood incompatibility (mean score for correct response = 39%). This will likely influence their practices with respect to uptake of incompatibility test. This result is consistent with the findings of Fikree et al. (2012) as earlier mentioned.

Table 2: distribution of respondents according to their knowledge of Maternal-Fetal Blood Incompatibility

Knowledge statements	Freq (n= 94)	percentage
Rhesus factor investigation should be done before marriage	63	67.0
I know my own blood groups	50	53.2
I know my husband's blood group	47	50.0
I am aware of likely complications related to negative blood group during pregnancy	25	26.6
I am Aware of likely complications related to negative blood group after pregnancy	28	29.8
I know what precautions that should be taken if a mother's blood group is Rhesus negative	26	27.7
I know about the consequences of blood incompatibility on Festus/newborn	16	17.0
		38.8%

Source: Computed from field Survey (2014)

Respondents' attitude towards maternal-fetal blood incompatibility test

The result of respondents' attitude regarding maternal-fetal blood incompatibility testis presented in Table 3. The women were assessed for positive and negative attitudes. Generally, the respondents exhibited average 'positive' attitude towards incompatibility test (56%) and low 'negative' attitude (38%). Many (60%) of the women believed maternal-fetal compatibility test is very important especially for pregnant women and are not afraid to do the test (67% of respondents) however, 56percent of the respondents felt the test procedure will be embarrassing. This result showed that pregnant women in the study area did not really see maternal-fetal blood incompatibility as a serious problem. Clearly the low level of knowledge must have been responsible for these obtained attitudes.

Table 3: Distribution of respondents according to their attitude towards maternal-fetal blood incompatibility

Attitudinal statements	Frequency*
Positive statements:	
Maternal-fetal compatibility test is very important especially for pregnant women	56(59.6%)
All women should do maternal fetal compatibility test whether recommended or not	47(50.0%)
I'm not afraid to think about or do the incompatibility test	63(67.0%)
I really care about my Rhesus factor	42(44.7%)
I do discuss with my husband about maternal blood incompatibility	57(60.6%)
	Mean score = 56.4%
Negative statements:	
Maternal-fetal compatibility test is an embarrassing procedure	53 (56.4%)
Maternal-fetal incompatibility test waste time	23(24.5%)
Maternal-fetal incompatibility test result make me feel unpleasant	39(41.5%)
If there is compatibility, I prefer to get treatment, from Traditional healer/deliver	42(44.7%)
I am reluctant about doing maternal-fetal compatibility test because I'm afraid to be positive.	20(21.3%)
	Mean score = 37.7%

Source: computed from field survey data (2014) *multiple response

Respondents' practices with respect to maternal- fetal blood incompatibility test

Further assessment was done to determine the women's practices with respect to maternal-fetal blood incompatibility and the result is presented in Table 4. The result showed that only 42 percent of the respondents have done the test. Most of the women who took the test did so in their first trimester (41% as shown in Table 4) which is the gestational age of the trimester. Most of these women (79%) did the test at the hospital where they are attended to by health professionals. However, some 21 percent of the respondents still patronized the traditional birth place for this test despite the fact that they were attending the teaching hospital for other pre-natal activities. It appears that the emphasis on maternal-fetal blood incompatibility and the need for the test is not well highlighted in the general pre-natal counseling delivered by the teaching hospital. This raises a serious policy concern.

Table 4: Assessment of Respondents' practices with respect to maternal- fetal blood incompatibility test

Variables	Freq	%
I have done fetal blood compatibility test (n = 94)	39	41.5
<i>Time of the gestational age when the test was done (n = 39)</i>		
First trimester	16	41.0
Second trimester	11	28.2
Third trimester	6	15.4
After birth	6	15.4
<i>Where the test was done (n = 39)</i>		
General hospital	16	41.0
Private hospital	15	38.5
Traditional Birth Place	8	20.5

Source: computed from field survey data (2014)

Factors influencing the uptake of maternal- fetal blood incompatibility test

The factors influencing the respondents' uptake of maternal-fetal blood incompatibility test were determined and presented in Table 5. The regression result as presented in Table 5 showed that out of all independent variables, the coefficient of the age of the pregnant women ($p < 0.1$), income level ($p < 0.05$), knowledge level ($p < 0.05$) and number of previous births ($p < 0.05$) were significant with appropriate signs. This implies that mothers' income, knowledge and number of previous births increases the probability of the respondents' taking the test. The coefficient for the age of the respondents ($p < 0.1$) was significant with a negative sign showing an inverse relationship between age and the probability of the respondents taking the incompatibility test. This implies that older women show less need for the test since they probably have done it in the past or see no need since they already have healthy children. Sadia, Ayaz, and Anjum (2011) have shown that Rh incompatibility was possible in women who were either primiparous or had delivered a child in the past. The descriptive result (Table 1) showed that many of the women have had previous births, thus many they are vulnerable to maternal-fetal blood incompatibility (Waheed et al., 2005). This result is consistent with the findings of Babalola et al. (2013) and Kio et al. (2016). Judging from earlier descriptive results, they have overall poor knowledge and attitude, increasing these factors is therefore pertinent to increase uptake of the test.

Table 5: Factors influencing the uptake of maternal- fetal blood incompatibility test

Independent variables	Beta coefficient	t-ratio
Constant	.353	2.957
Age of respondent	-0.091*	1.856
Educational level	0.598	1.214
Income level	0.067**	2.220
Knowledge level (score of responses)	1.045**	3.064
Attitude (score of responses)	0.101	1.503
Parity (no. of births)	0.394**	2.297

*Significant at 10% level **significant at 5% level; Pseudo $R^2 = 0.62$; Log likelihood = -47.110**

Source: Computer from field survey data (2015)

CONCLUSION AND RECOMMENDATION

The study assessed the knowledge, attitude and practice of maternal-fetal blood incompatibility among expectant mothers in Ogun state, Nigeria. In general, most of the respondents had poor knowledge and practices with respect to maternal-fetal blood incompatibility. Therefore interventions aimed at social and behaviour change should primarily target increasing knowledge, improving attitudes and addressing the gaps in practices highlighted by the study.

Based on the findings in this study, the following issues should be considered for improving knowledge, attitude and practice of maternal-fetal blood incompatibility among expectant mothers in the study area and in Nigeria in general:

1. Special attention should be focused on improving respondents' knowledge about maternal-fetal blood incompatibility. It is imperative to use appropriate educational intervention that addresses the gap in knowledge as highlighted in the study, to corroborate the health information these women receive from the clinic.
2. More efforts should be made to make the incompatibility test even free to women attending clinics.
3. Community healthcare service providers and churches should include in their services the counsel of mothers on the importance maternal-fetal blood incompatibility test.

COMPETING INTERESTS

This article is free from all forms of conflicting interest.

AUTHORS' CONTRIBUTIONS

All the authors of this paper made contributions. Author Kio Janet was the principal investigator for the research. Kio Janet and Oroniya Florence designed the study and designed the questionnaire. The first draft was written by Kio Janet, Agbede Catherine, and Oroniya Florence. Kio Janet and Agbede Catherine managed the literature searches. Field work was done by Authors Kio Janet and Oroniya Florence. All authors read and approved the final manuscript.

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