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Knowledge of Rhesus Incompatibility and Prevention Practices Among Pregnant Women Attending Antenatal Care in Irrua, Nigeria

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Abstract

Background: Hemolytic disease of the newborn caused by rhesus D (Rh D) allo-immunization is widely known to be responsible for perinatal morbidity and mortality. Aims: The study assessed the knowledge of rhesus incompatibility and prevention practices among pregnant women attending antenatal care at Irrua specialist hospital in Irrua.

Study Design and Methods: A descriptive research design was used for the study and 149 pregnant women were selected using convenient probability sampling technique.

Results: While majority of the respondents have heard about blood grouping, 17.2% have not heard about rhesus factor. The analysis of the prevention practices of the respondents towards rhesus incompatibility shows that more than half of the respondents had never heard about Anti-D given to rhesus negative women married to rhesus positive men to prevent pregnancy complications and most agreed rhesus factor investigations should be done before marriage. The analysis on the factors affecting prevention practices towards rhesus incompatibility shows that majority of the respondents agreed that rhesus incompatibility test is a waste of time. There was a significant association between the knowledge and prevention practices of pregnant women attending antenatal care at Irrua specialist teaching hospital towards Rh factor incompatibility ($r=0.610$, $P<0.05$).

Conclusion: Intensive education on the importance of Anti-D in the prevention of rhesus incompatibility complications and policy implementation geared towards pre-conception Rhesus factor screening are most needed.

Keywords: rhesus; incompatibility; pregnant; women; prevention; practices; antenatal

Introduction

Rhesus factor is an inherited antigen present on the surface of erythrocytes. Rhesus positive are individuals whose erythrocytes possess the antigen. Although 'Rhesus positive' is the most prominent blood type, those who are 'Rhesus negative' exhibit a high likelihood of developing immunity (iso-immunization) against fetal Rhesus factor inherited from the paternal chromosome [1-5]. Studies have indicated the rhesus status among pregnant women in Nigeria. A study conducted by Okeke et al., (2012) [6] showed that out of 6306 pregnant women who booked for antenatal care, 4.5% were Rh D negative women. Otomewo et al., (2020) [7] showed that out of 700 women, 100% were Rhesus C positive while 91.6% were Rhesus D positive and just 8.4% were Rhesus D negative. Another study by Oseni and Akomolafe, (2011) [8] examined the frequency of maternal-fetal rhesus incompatibility in Osogbo. A high prevalence of ABO maternal-fetal incompatibility was observed without detection of

immune agglutinins and this might indicate a rare case of hemolytic disease of new born. Feto-maternal rhesus incompatibility has remained concerns owing to the possibility of maternal immunoglobulins crossing the placental barrier to destroy fetal erythrocytes [9]. Massive destruction of erythrocytes leads to increase in bilirubin levels, increase in the production of reticulocytes (reticulocytosis) and release of immature red blood cells (erythroblasts) from fetal liver. Since erythrocytes are major medium through which respiratory gases are transported, their massive destruction orchestrates tissue hypoxia, jaundice, morbidity and mortality [10-15]. In 2016, reports of World Health Organization indicated that 46% of deaths of children under age 5 years was caused by majorly by rhesus incompatibility [16,17]. The knowledge and awareness about rhesus incompatibility and its complication during pregnancy and after child birth varies in developing countries including Nigeria depending on the socio-economic development and literacy. Hence, there is

need to determine the level of awareness and knowledge in towns including Irrua. The aim of the study was to assess the knowledge of rhesus incompatibility and prevention practices among pregnant women attending antenatal care at Irrua specialist hospital in Irrua.

Materials and Methods

Research Design

The research design utilized in this study was a descriptive survey. The design is appropriate for the study as it allows the collection of original data from the respondents to investigate the research problem.

Setting of the Study

The setting of this study was Irrua specialist teaching Hospital, Edo state. Irrua specialist teaching hospital is one of the premier hospitals in Edo State located at Irrua, KM 87 Benin Auch Rd, Edo state. It offers specialist services including obstetrics, gynecology, pediatrics, internal medicine, surgery, antenatal clinic etc. It also houses units like accident and emergency unit, antenatal clinic, heart to heart clinic. The hospital also facilitates clinical experiences for student nurses as well as medical students.

Target Population

The target population for the study comprised of 145 Pregnant Women coming for antenatal care services at Irrua specialist Hospital, Edo state who were currently registered at the clinic in the month of September. This group was considered because rhesus incompatibility can be prevented if the women at risk are discovered early and appropriate measures taken.

Sample and Sampling Technique

Sample Size Determination

The sample size of this study was calculated using the Cochran's formula because the population is unknown.

$$n^0 = \frac{Z^2 pq}{e^2}$$

Where; n = minimum sample size required; z = statistical parameter that depends on the level of confidence; 2.326; p = estimate of variance. ($q=1-p$); e = margin error ($e=0.1$).

Inclusion Criteria

These include all pregnant women attending antenatal clinic in Irrua specialist teaching Hospital, Edo State at the time of the study. Pregnant women attending antenatal clinic in Irrua specialist teaching Hospital, Edo State willing to participate in the study

by giving oral informed consent and those who were physically and mentally fit.

Instruments for Data Collection

The instrument for this study was a structured questionnaire, it comprises of 1-23 close ended question. The questionnaire covers 4 sections of the study.

Section A: This comprised 7 question items on socio demographic data of participants.

Section B: contains 9 questions to elicit information from the respondents on the knowledge about rhesus incompatibility.

Section C: contains 5 questions to elicit information from the respondents about the prevention practices towards rhesus incompatibility.

Section D: contains 2 questions to elicit information from the respondents about factors affecting prevention practices of rhesus incompatibility.

Method of Data Analysis

Data analysis was performed using statistical package for social science (SPSS) version 22. Data was summarized using descriptive statistics of frequency and percentage. Inferential statistics of Chi-square was used to determine association between the variables for the hypotheses. P- Value was set at $p < 0.05$.

Ethical Consideration

Ethical clearance was sought and obtained from the Department of Nursing Science of Edo State University Uzairue before data collection. An introductory letter was taken from the Head of Department of Nursing Sciences, Edo University Iyamho, to seek permission to conduct the research.

Results

The distribution of the respondent according to age revealed that majority of the respondents, 67 (43.5%) were between the ages of 18-22 years, 32 (22.1%) were between 22-27 years, 26 (17.9%) was between the ages of 28-32 years, 10 (6.9%) were between the ages of 33-37 years while others, 14 (9.7%) were within the ages of 38 years and above. Distribution of respondents according to gender revealed that all the respondents 149 (100%) was female. Distribution of respondents according to marital status revealed that majority of the respondents 131 (90.3%) were married, 8 (2.6%) were single while others 10 (6.9%) were divorced. Distribution of respondent according to religion showed that majority of the respondents, 60 (41.4%) practiced Islam and 54 (37.2%) practiced

Christianity, Others 9 (6.2%). Distribution according to ethnicity revealed that most of the respondent hailed from Afemai 78 (53.8%), Esan 19(13.1%), Bini revealed 24 (13.8%), Hausa revealed 15(10.3%) and others were 13 (9.0%) Distributions of respondents according to level of study revealed that majority 76 (49.7%) with secondary education, 35(24.1%) with primary education and 38 (26.2%) with tertiary level of education. Distribution of respondents according

to number of pregnancies revealed that majority of the respondents 72(49.7%) with 3-4 pregnancies, 63(43.4%) with 1-2 pregnancies and 14(6.9%) with 5 and above pregnancies. The distribution of the respondent according to occupation revealed that majority of the respondents are self-employed 57(37.2%), farmers 44(27.6%), housewife 32(22.1%) and 19(13.1%) government.

Table 1: Frequency and Distribution of Demographic Characteristics of Respondents.

Variables	Frequency (N= 149)	Percentage (%)
Age (in Years)		
18-22	67	43.4
22-27	32	22.1
28-32	26	17.9
33-37	10	6.9
38+	14	9.7
Marital Status		
Single	8	2.6
Married	131	90.3
Divorced	10	6.9
Religion		
Christian	54	37.2
Islam	60	41.4
Others	9	6.2
Ethnicity		
Esan	19	13.1
Bini	24	13.8
Hausa	15	10.3
Afemai	78	53.8
Others	13	9.0
Level of Education		
Primary Level	35	24.1
Secondary Level	76	49.7
Tertiary Level	38	26.2
Number of Pregnancies		
1-2	63	43.4
3-4	72	49.7
5 and above	14	6.9
Occupation		
Government	19	13.1
Farmer	44	27.6
Self Employed	54	37.2
Housewife	32	22.1

The analysis above shows that majority 143(95.9%) of the respondents have heard about blood grouping while 6(4.1%) haven't heard about it before. It also revealed that 25 (17.2%) have not heard about Rhesus factor while 124(82.8%) have heard about it before. 141 (97.2%) of the respondents knew their blood group while 9(2.8%) didn't know their blood group.

The analysis also shows that 81(53.1%) of the respondents know their Rhesus factor while the remaining 68(46.9%) didn't. Data from the respondents also shows that 82(53.8%) of them know their husbands blood group and Rhesus factor while the remaining 69(46.2%) didn't know their husband Rhesus factor.

Analysis also shows that majority 57(39.3%) believed that pregnancy can be affected by different Rhesus factor of their partners while 88(60.7%) disputed that fact. 73(49%) agreed that rhesus incompatibility can lead to still births and miscarriages and 76(51.0%) said it can't. Some of the respondents believed that Rhesus factor incompatibility can be prevented while

majority 79(51.6%) disagreed that it can't be prevented. 94 (62.1%) of the women disagreed to ever hearing about Anti-D given to rhesus negative women married to rhesus positive men and vice versa complications while 55 (37.9%) agreed to have heard about it.

Table 2: Knowledge about rhesus incompatibility among respondents.

Variable	Yes (%)	No (%)
Have you Heard About Blood Grouping Before?	143 (95.9%)	6 (4.1%)
Have you Heard About Rhesus Factor?	124 (82.8%)	25 (17.2%)
Do you know your Blood Group?	141 (97.2%)	9 (2.8%)
Do you know your Rhesus Factor?	81 (53.1%)	68 (46.9%)
Do you know your Husbands Blood Group and Rhesus Factor?	82 (53.8%)	69 (46.2%)
Can a Pregnancy be Affected by Different Rhesus Factor of The Partners?	57 (39.3%)	88 (60.7%)
Can That Result into Stillbirths or Miscarriage?	73 (49%)	76 (51.0%)
Can Rhesus Incompatibility be Prevented?	70 (48.4%)	79(51.6%)
Have you Heard About Anti-D, Given to Rhesus Negative Women Married to Rhesus +Ve Men to Prevent Pregnancy Complications?	55 (37.9%)	94 (62.1%)

Table 3 shows the prevention practices towards rhesus incompatibility of the respondents. The analysis shows that most of the respondents 99 (66.9%) have not heard about Anti-D, given to rhesus negative women married to rhesus +ve men to prevent pregnancy complications while 33.1% have heard about it. Result shows that more than half of the respondents 96 (63.4%) will go to the hospital when they keep experiencing frequent stillbirths and miscarriages while 81 (53.1%) said they will go to church, 42 (29%) will go to the witch doctors house, 25 (17.2%) will look for other solutions. 120 (82.8%)

opted that they won't look for other solutions, 103 (71%) declined going to witch doctors, 68 (46.9%) declined going to church at all while 53 (36.6%) declined going to the hospital. Analysis also shows that more 135 (93.1%) than half of the respondents opted to pay for anti-D, 22 (15.2%) opted to have one child and stop Have One Child and Stop, 12 (8.3%) said they will Divorce for a Rh-negative Man and 5(3.4%) opted for other options. Lastly the data above shows that 135 (93.1%) of the women believed that treatment given at the hospital can prevent stillbirths and miscarriage while 10(6.9%) disputed that.

Table 3: Prevention Practices towards Rhesus Incompatibility.

Variable	Yes (%)	No (%)
Have you Ever Heard About Anti-D, Given to Rhesus Negative Women Married to Rhesus +Ve Men to Prevent Pregnancy Complications?	50 (33.1%)	99(66.9%)
Where Will you go for Help U If Had Frequent Stillbirths or Miscarriages?	81 (53.1%)	68 (46.9%)
Church		
Witchdoctor/Wizard	42 (29%)	103 (71%)
Herbalist	96 (63.4%)	53 (36.6%)
Hospital	25 (17.2%)	120 (82.8%)
Do You believe the Treatment Given in Hospital Can Prevent the Stillbirths or Miscarriages?	135 (93.1%)	10 (6.9%)
Apart from Spending 50,000 For Anti D, What Would you Rather do to Avoid Rhesus Incompatibility?	135 (93.1%)	10 (6.9%)
Have One Child and Stop	22 (15.2%)	123(84.8%)
Divorce the Rh -Ve Man	12 (8.3%)	133(91.7%)
Others	5(3.4%)	140(96.6%)
Rhesus Factor Investigations Should be Done Before Marriage?	132 (91.0%)	17 (8.9%)

Table 4 shows that more than half of the respondents 96 (63.4%) believe rhesus incompatibility test is a

waste of time while 53 (36.6%). Analysis also shows that 135(93.1%) are of the opinion that 20,000 is too

expensive for the prevention of miscarriages and stillbirths while 6.9% disagreed the price being too

expensive. 91.7% (137) disagreed to opting for other options while 12(8.3%).

Table 4: Factors Affecting Prevention Practices of Rhesus Incompatibility.

Variable	Yes (%)	No (%)
Rhesus incompatibility test is a waste of time?	96(634%)	53(36.6%)
What do you think about spending around 50,000 to prevent miscarriages or stillbirths?		
-It's Too Expensive?	135(93.1%)	14(6.9%)
-May Opt for Alternatives?	12(8.3%)	137(91.7%)

Table 5 showed that there was a significant association between the knowledge and prevention practices of pregnant women attending antenatal care at Irrua specialist teaching hospital towards Rh factor incompatibility.

Table 5: Association between Knowledge and Prevention Practices of Women Attending Antenatal at Irrua Specialist Teaching Hospital towards Rhesus Incompatibility.

Variable	N		S.D.	Pearson r-coefficient	p-value
Knowledge	149	2.77	.940	0.610*	0.000

*Correlation is significant at the 0.05 level (2-tailed).

Discussion

Rhesus incompatibility is a significant life-threatening health concern. The aim of the study was assessed the knowledge of rhesus incompatibility and prevention practices among pregnant women attending antenatal care at Irrua specialist hospital in Irrua. The distribution of the respondent according to age revealed that majority of the respondents, 67 (43.5%) was between the ages of 18-22 years. In a study by Abd Elhakim et al., (2024) [18], 84.7% of the respondents were in the range of 20 and 35 year. In the study, all respondents were females with 90.3% claiming to be married. Based on religion, majority of the respondents, 60 (41.4%) practiced Islam and 54 (37.2%) practiced Christianity, Others 9 (6.2%). Most of the respondent hailed from Afemai 78 (53.8%), Esan 19(13.1%), Bini revealed 24 (13.8%), Hausa revealed 15(10.3%) and others were 13 (9.0%). According to education level, 76 (49.7%), 35(24.1%) and 38(26.2%) had secondary, primary education and tertiary education respectively. In a study by Abd Elhakim et al., (2024) [18], 11.3% of respondents had tertiary education. Also, majority of the respondents 72(49.7%) had 3-4 pregnancies, 63 (43.4%) with 1-2 pregnancies and 14 (6.9%) with 5 and above pregnancies. Majority of the respondents are self-employed 57 (37.2%), farmers 44 (27.6%), housewife 32 (22.1%) and 19 (13.1%) government.

The analysis above shows that majority 143 (95.9%) of the respondents have heard about blood grouping while 6 (4.1%) haven't heard about it before. It also revealed that 25 (17.2%) have not heard about Rhesus

factor while 124 (82.8%) have heard about it before. 141 (97.2%) of the respondents knew their blood group while 9 (2.8%) didn't know their blood group. The analysis also shows that 81(53.1%) of the respondents know their Rhesus factor while the remaining 68(46.9%) didn't. Data from the respondents also shows that 82 (53.8%) of them know their husbands blood group and Rhesus factor while the remaining 69 (46.2%) didn't know their husband Rhesus factor. Analysis also shows that majority 57 (39.3%) believed that pregnancy can be affected by different Rhesus factor of their partners while 88 (60.7%) disputed that fact. correlates Minwuyet, (2021) [19] reported that only 5.7% of mothers knew that Rh incompatibility was because of Rh negative mothers carrying Rh positive fetus.

More than two-third of mothers (66.7%) did not know their husband's blood group and Rh. The study result showed that only 39.1% of mothers had good level of knowledge towards rhesus incompatibility. 73(49%) agreed that rhesus incompatibility can lead to still births. Majority 79(51.6%) claimed rhesus incompatibility can't be prevented. This concurs with the findings of Nasim et al., (2019) [20].

More than sixty percent of the women claimed that they have never heard about Anti-D given to rhesus negative women married to rhesus positive men and vice versa. Evidently, the finding showed that the pregnant women did not have adequate knowledge about rhesus incompatibility in Irrua. Like the studies of Ojo et al., (2021) [21] and Kanikwu, (2018) [22],

there is urgent need for education on rhesus D iso-immunization and its benefits (Kanikwu, 2021) [23]. Concerning the factors that influence knowledge of pregnant women about prevention practices of rhesus incompatibility, 63.4% believed rhesus incompatibility test was a waste of time while 53 (36.6%). 93.1% were of the opinion that the cost of prevention of miscarriages and stillbirths was high. 91.7% of respondents disagreed to opting for other options.

Conclusion

The women attending antenatal at Irrua specialist hospital do not have adequate knowledge about rhesus D iso-immunization for the prevention of rhesus incompatibility. The study findings have shown the need for further research with mothers from several public and private hospitals in the rural and urban towns to understand the phenomenon of their knowledge and prevention practices towards Rhesus factor incompatibility using a quantitative approach with a larger sample to allow generalization of the findings. There is need for consistent education on the knowledge and prevention of rhesus incompatibility among pregnant women. There is need for the provision of free rhesus laboratory investigation for pregnant women attending antenatal clinics, more efforts should be made to make the incompatibility test free to women attending clinics. Government should invest more in provision of centers that specifically provides genetic counseling for couples intending to get married. Religious organization needs to be involved in the provision of education on rhesus compatibility and incompatibility among pregnant women in Nigeria. Community healthcare service providers and churches should include in their services the counsel of mothers on the importance of rhesus incompatibility test.

Declarations

Conflict of interest

None.

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