

UNVEILING THE UNKNOWN: INVESTIGATING KNOWLEDGE AND PREVENTIVE PRACTICES OF RH FACTOR INCOMPATIBILITY AMONG PREGNANT WOMEN AT AHMADU BELLO UNIVERSITY TEACHING HOSPITAL, SHIKA, ZARIA.

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ABSTRACT

Rhesus (Rh) incompatibility is a significant contributor to neonatal morbidity and mortality. This study investigated the knowledge and preventive practices of Rh factor and Rh incompatibility among pregnant women attending antenatal care at Ahmadu Bello University Teaching Hospital (ABUTH), Shika, Zaria. A cross-sectional descriptive survey was adopted, involving 234 respondents selected from 250 pregnant women using Taro Yamane's sampling formula. Data were collected using a structured questionnaire and analyzed with SPSS version 27 statistical tools. The result of this study indicates that majority of the respondents are within 18-28 years (59%), married (90%) and Christian by religion (61.5%). This study further reveal that majority of the respondents are both housewives and students (25.6%) and have tertiary education (60.26%). Further findings reveal that the respondents knowledge of rhesus factor and rhesus incompatibility is very high (84%) and attitude towards rhesus incompatibility prevention is positive ($\bar{\chi}=3.3$). Lastly, study reveal that Preventive Practices towards Rhesus factor Incompatibility Prevention is very high (94.1%). The study recommended that healthcare providers intensify awareness and that the Federal Ministry of Health subsidize the cost of Rh immunoglobulin (Anti-D) to ensure its availability for Rh-negative women.

Keywords: Rhesus factor; Incompatibility; Antenatal Care; Knowledge; Prevention.

INTRODUCTION

Rhesus (Rh) incompatibility is a significant public health concern that contributes to neonatal morbidity and mortality globally. It occurs when an Rh-negative mother is exposed to Rh-positive fetal blood cells, leading to the production of Rh antibodies that can cross the placenta and destroy fetal red blood cells, resulting in hemolytic disease of the newborn (HDN) (Holburn & Prior, 2019; Scott & Ricci, 2018). This condition remains one of the most common blood group incompatibilities in clinical practice and can lead to severe complications such as fetal anemia, hydrops fetalis, and even death if not properly managed (Lazer et al., 2021).

Globally, it is estimated that there are approximately 10.6 cases of HDN caused by Rh incompatibility per 10,000 deliveries (Chavez et al., 2017). In Africa, the reproductive risk for Rh-negative women is notably higher than for their non-African counterparts, with studies indicating that the burden of Rh disease disproportionately affects poorer countries (Kio et al., 2016; Khana, 2020). In Nigeria specifically, statistics reveal that Rh disease contributes to the deaths of approximately 144 women daily due to pregnancy-related complications and is a major factor in high infant mortality rates (Sola, 2016). Despite the introduction of effective interventions such as Anti-D immunoglobulin in 1968, which significantly reduces the risk of Rh-D alloimmunization in Rh-negative women who have given birth to an Rh-positive infant (Nasif, 2015), awareness and knowledge about Rh incompatibility

remain alarmingly low. Many individuals are unaware of their blood type and its implications during pregnancy, leaving them uninformed about the potential dangers posed by Rh incompatibility (Sadim et al., 2020). This knowledge gap is particularly pronounced in developing countries like Nigeria, where discussions surrounding Rh incompatibility are infrequent.

The World Health Organization (2016) reports that neonatal mortality accounts for approximately 46% of deaths in children under five years of age, with a significant proportion attributed to conditions like Rh incompatibility. Despite advancements in medical technology and increased availability of preventive measures, ignorance about Rh incompatibility persists due to insufficient educational programs targeting expectant mothers and healthcare providers alike (Zipursky, 2018). This study investigates the knowledge and preventive practices related to the Rh factor and Rh incompatibility among pregnant women attending antenatal care at Ahmadu Bello University Teaching Hospital (ABUTH), Shika, Zaria. By assessing the level of awareness and understanding among this population, the research aims to identify gaps in knowledge that could lead to adverse maternal and neonatal outcomes. Additionally, it seeks to provide recommendations for enhancing educational initiatives aimed at improving awareness and preventive practices regarding Rh incompatibility in Nigeria.

MATERIALS AND METHODS

Research Design: A cross-sectional descriptive survey design. This design allows for the collection of data at a single point in time, facilitating a comprehensive analysis of the phenomena under study and enabling generalization of findings to a larger population.

Study Setting: The study was conducted in the Antenatal Clinic of ABUTH, located in Shika along the Zaria-Sokoto road in Giwa Local Government Area, Kaduna State, North West

Nigeria. ABUTH serves as a tertiary and referral hospital, providing comprehensive healthcare services and training for medical professionals, including doctors, nurses, and laboratory technologists. The antenatal clinic offers various services, including screening for abnormalities, family planning, and health education for pregnant women throughout their pregnancies.

Target Population: The target population comprised 750 pregnant women attending antenatal care at ABUTH from January 2024 to June 2024. The inclusion criteria encompassed all pregnant women irrespective of marital status, gravida (number of pregnancies), or parity (number of births).

Sample Size Determination: Using attendance records from the antenatal clinic, it was estimated that approximately 750 pregnant women visited the clinic during the specified period. The sample size was calculated using Taro Yamane's formula: $n = \frac{N}{1 + N(e)^2}$

Where:

n = sample size

N = total population (750)

e = margin of error (0.05)

Calculating the sample size:

$$\begin{aligned} n &= \frac{750}{1 + 750(0.05)^2} \\ &= \frac{750}{1 + 750(0.0025)} \\ &= \frac{750}{1 + 1.875} \\ &= \frac{750}{2.875} \\ &= 261 \end{aligned}$$

To ensure adequate representation and account for potential non-response 10% were added, and a final sample size of 287 participants was determined.

Sampling Technique: Simple random technique was employed to select participants based on their availability and willingness to participate in the study. Pregnant women attending the antenatal clinic who consented to participate were included in the study.

Data Collection Instrument: Data were collected using a self-structured questionnaire developed based on the research objectives. The questionnaire consisted of four sections:

- Section A: Demographic data of the respondents (age, marital status, education level).
- Section B: Knowledge of Rh factor and Rh incompatibility.
- Section C: Attitudes towards Rh factor incompatibility.
- Section D: Practices related to preventing Rh incompatibility.

The knowledge section included ten questions with a scoring system where each correct response earned one point, leading to a maximum score of 10 points. Attitudes were assessed using a 4-point Likert scale ranging from "strongly agree" to "strongly disagree."

The knowledge levels of respondents were categorized into three tiers based on their scores:

- High Knowledge: 80-100%
- Moderate Knowledge: 50-79%
- Low Knowledge: Below 49%

Attitude scores were averaged to determine overall attitudes toward Rh factor incompatibility prevention. An aggregate mean score of 2.5 or above indicated a positive attitude, while scores below 2.5 reflected negative attitudes. Practices related to Rh incompatibility prevention were analyzed using frequencies and percentages.

Method of Data Analysis: The knowledge of the respondents was categorized into three levels. A scoring system was developed, with a total of 10 questions on knowledge, each rated 10 marks, for a maximum score of 100 marks (100%). Respondents scoring 80-100% were classified as having a high level of knowledge. Those scoring 50-79% were considered to have a moderate level of knowledge. Scores of 49%

and below were categorized as low knowledge of rhesus factor and rhesus incompatibility.

Attitude was assessed using a 4-point Likert scale, and the aggregate mean was calculated. An aggregate mean of 2.5 and above was regarded as a positive or good attitude, while a mean score of less than 2.5 was considered a poor or negative attitude. Practices related to rhesus incompatibility prevention were analyzed using frequencies and percentages.

Ethical Considerations: Ethical clearance was obtained from the Health Research Ethics Committee at Ahmadu Bello University Teaching Hospital (Approval Number: NHREC/ABUTH-NHREC/29/08/23). After explaining the study's purpose and benefits, all participants gave informed verbal consent. Participation was voluntary, and confidentiality was maintained throughout the research process.

RESULTS

Table 1 reveal that most of the respondents (59%) are within the range of 18-28 years and only 6.4% of the respondents are 39 years and above. Also, the table reveals that majority 90% of the respondents are married, only 9% of them are single. Furthermore, the table illustrates that 48 of the respondents (61.5%) are Muslims while 38.5% of them are Christians. With regards to the occupation of the respondents; 25.6% are housewives, 24.4% are business women, 25.6% are students and only 7.7% are teachers. It can also be observed that majority of the respondents (60.26%) are at the tertiary education level while only 6.41% had only primary education. This study indicates that majority of the respondents are within 18-28 years (59%), married (90%) and Christian by religion (61.5%). This study further reveal that majority of the respondents are both housewives and students (25.6%) and have tertiary education (60.26%).

Table 1: Sociodemographic Characteristics of respondents (n=234)

Age Ranges	Frequency	Percentage (%)
18-28	138	59.0
29-39	81	34.6
39 and above	15	6.4
Marital Status		
Single	21	9.0
Married	210	90
Separated	3	1
Religion		
Christianity	90	61.5
Islam	144	38.5
Occupation		
House wife	60	25.6
Business	57	24.4
Student	60	25.6
Teacher	18	7.7
Others	39	16.7
Educational Level		
Primary	15	6.41
Secondary	78	33.33
Tertiary	141	60.26

Table 2 presents the knowledge of rhesus factor and rhesus incompatibility among the respondents. Majority 207 (88%) of the respondents know that rhesus factor is an antigen found on the red blood cells of most people, 210 (90%) agree that rhesus factor is associated with blood group. However, 195 (83%) agree that if they have the antigen, they rhesus positive, likewise 183 (78%) know rhesus factor is inherited from parents. Also, majority 225 (96%) know there is a difference between blood group and blood genotype and 204 (87%) agree that rhesus-negative blood

type need follow-up care during pregnancy. Majority 210 (90%) of respondents agree rhesus incompatibility is preventable but only 111 (47%) agree that rhesus incompatibility can occur when a rhesus negative man, marries a rhesus positive woman. Finally, majority 213 (91%) agree that rhesus incompatibility can cause miscarriage or death of new born and 195 (83%) know that rhesus incompatibility occurs when mother is rhesus negative and father is positive. This study conclude that the respondents knowledge of rhesus factor and rhesus incompatibility is very high (84%).

Table 2: Knowledge of Rhesus Factor And Rhesus Incompatibility

S/N	Variables	Yes	No
1.	Rhesus factor is an antigen found on the red blood cells of most people.	207 (88%)	27 (12%)
2.	Rhesus factor is associated with blood group.	210 (90%)	24 (10%)
3.	If I have the antigen, I am rhesus positive.	195 (83%)	39 (17%)
4.	Rhesus factor is inherited from parents.	183 (78%)	51 (12%)
5.	There is a difference between blood group and blood genotype.	225 (96%)	9 (4%)
6.	Rhesus-negative blood type need follow-up care during pregnancy.	204 (87%)	30 (13%)
7.	Rhesus incompatibility is preventable.	210 (90%)	24 (10%)
8.	Rhesus incompatibility cannot occur when a rhesus negative man, marries a rhesus positive woman.	123 (53%)	111 (47%)
9.	Rhesus incompatibility can cause miscarriage or death of new born	213 (91%)	21 (9%)
10.	Rhesus incompatibility occurs when mother is rhesus negative and father, positive.	195 (83%)	39 (17%)
		84%	15.1%

Table 2b illustrates that 60.26% of the respondents have high knowledge of rhesus factor and rhesus incompatibility, 25.64% have

moderate knowledge, while 14.1% have low knowledge of it.

Table 2b : Level of Knowledge of Rhesus factor and Rhesus Incompatibility

Level of Knowledge	Frequency	Percentage (%)
High Knowledge	141	60.26
Moderate Knowledge	60	25.64
Low Knowledge	33	14.1
Total	234	100

Table 3 depicts the attitude of the women towards rhesus incompatibility prevention. From the findings of the study, 198 of the respondents, representing 84.6% strongly agreed that rhesus compatibility test is important especially for pregnant women, only 1.3% disagreed. 60.2% strongly agreed that they care about their Rhesus factor, 61.5% strongly agreed that they are not afraid to do the rhesus incompatibility test while only 10.3% agreed that they are reluctant to do the incompatibility test because they are afraid of being positive.

Furthermore, the table illustrates that 75.64% of the respondents strongly agreed that they prefer to get treatment if there is incompatibility, while only 15.4% of the respondents strongly agreed that rhesus incompatibility test makes them feel unpleasant. 71.8% of the respondents are of the opinion that rhesus compatibility test should be done before marriage, only 3.85% disagreed. An aggregate mean of 3.3 was obtained indicating a positive attitude towards rhesus incompatibility prevention.

Table 3: Attitude towards Rhesus factor Incompatibility Prevention

Variables	SA	A	D	SD	n	Mean
Rhesus Incompatibility test is important especially for pregnant women.	198 (84.6%)	33 (14.1%)	3 (1.3%)	0 (0%)	897	3.8
I really care about my rhesus factor.	141 (60.2%)	90 (38.5%)	3 (1.3%)	0 (0%)	840	3.6
I am not afraid to do the rhesus incompatibility test.	144 (61.5%)	63 (26.9%)	24 (10.3%)	1 (1.3%)	819	3.5
I am reluctant to do the incompatibility test because I am afraid to be positive.	39 (16.6%)	24 (10.3%)	105 (44.9%)	66 (28.2%)	504	2.2
If there is incompatibility, I prefer to get treatment.	177 (75.64%)	45 (19.23%)	12 (5.13%)	0 (0%)	867	3.7
Rhesus Incompatibility test result makes me feel unpleasant.	36 (15.4%)	48 (20.5%)	105 (44.9%)	45 (19.2%)	543	2.3
Rhesus compatibility test should be done before marriage.	168 (71.8%)	48 (20.5)	9 (3.85%)	9 (3.85%)	870	3.7

Aggregate mean =3.3

Table 4 illustrates the Practices of the pregnant women towards rhesus factor incompatibility prevention. Of the 234 respondents, majority (94.8%) stated that they will seek medical help if they experience frequent miscarriages, 96.1% stated that they will go to hospital if they experience frequent miscarriages, only 2.6% reported that they will go to church.

Furthermore, the table reveals that 91% of the respondents chose paying for Anti D as a

prevention for rhesus Incompatibility while 7.7% stated that they will have only one child. 91% of the women stated that they will go to the hospital during pregnancy to get Anti D if they are rhesus negative and their partner positive, 98.7% stated that they will notify their health care giver if they have previously had an abortion only 1.3% reported that they will notify their friend. Study reveal that Preventive Practices towards Rhesus factor Incompatibility Prevention is very high (94.1%).

Table 4: Preventive Practices towards Rhesus factor Incompatibility Prevention (n=234)

Variables	Frequency	Percentage (%)
What will you do if you experience frequent miscarriage or still births?		
• Pray about it.	6	2.6
• Notify mother	6	2.6
• Seek medical help	222	94.8
Where will you go for help if you had frequent stillbirths or miscarriages?		
a. Church	6	2.6
b. Herbalist	3	1.3
c. Hospital	225	96.1
What would you do to prevent rhesus Incompatibility?		
1. Pay for Anti D	210	
2. Have one child stop	18	
3. Divorce	6	
What will you do if you are rhesus negative and your partner is rhesus positive?		
1. Accept it as God's will	18	7.7
2. Go to the hospital during pregnancy to get Anti D	213	91.0
3. Divorce	3	1.3
What will you do if you had previously had an abortion?		
• Notify health care giver	231	98.7
• Notify a friend	3	1.3

Discussion of Findings

The study revealed several important insights into the knowledge, attitudes, and practices of pregnant women regarding Rh factor incompatibility at Ahmadu Bello University Teaching Hospital (ABUTH), Shika. This study indicates that majority of the respondents are within 18-28 years, married and Christian by religion. This study further reveal that majority of the respondents are both housewives and students and have tertiary education.

This study conclude that the respondents knowledge of rhesus factor and rhesus incompatibility is very high. This contrasts with studies from other regions in Nigeria and Africa where awareness of Rh factor remains limited. For instance, a study by Adeyemi and Bello-Ajao (2016) found that only 34% of women attending antenatal clinics in Southwestern Nigeria were aware of their Rh status, highlighting a regional disparity in awareness. The writers penned that the higher knowledge levels among women attending ABUTH may also be attributed to the tertiary hospital setting, where antenatal care includes routine education on blood groups and Rh factor. In contrast, Kio et al., (2016) observed that many women in rural or primary healthcare settings in Nigeria and other African countries may not receive this level of education.

This study indicate a positive attitude towards rhesus incompatibility prevention. This aligns with findings from Abbie (2021), who noted that 86% of pregnant women in Ethiopia displayed a positive attitude toward Rh testing and prevention. The writers posited that the positive attitude is further reflected in the fact that majority of the respondents indicated that they would seek medical treatment if Rh incompatibility was detected, reinforcing the importance of antenatal education in promoting proactive health-seeking behavior. This study is not consistent with Sola et al., (2019) who reveal that the role of cultural and religious beliefs in shaping health behaviors, particularly in rural or less-educated populations, where similar sentiments have been observed.

Study reveal that Preventive Practices towards Rhesus factor Incompatibility Prevention is very high. This study is consistent with global trends, where women who are better informed about Rh incompatibility are more likely to seek medical intervention. For example, a study in the United States by Chavez et al. (2017) found that over 95% of Rh-negative women opt for Anti-D prophylaxis during pregnancy, a practice that has significantly reduced the incidence of hemolytic disease of the newborn in developed countries. This study is consistent with the findings from Nwagwu & Ofubebe (2019), where over 80% of intending couples in Nsukka were aware of the need for Rh testing before marriage. This study is in agreement with Holburn & Prior (2019) who indicated that the incidence of Rh-related complications has dropped by over 90% in countries like the United Kingdom and the United States, where Anti-D is provided free of charge to Rh-negative women.

Conclusion

The study concluded that pregnant women attending antenatal care at ABUTH had a good understanding of Rh factor incompatibility, positive attitudes towards its prevention, and appropriate health-seeking practices.

Recommendations

Based on the findings from this study, the following recommendations were made: Health care providers should integrate teachings on rhesus incompatibility in antenatal care services so as to increase awareness. Federal ministry of health should make immune-globulin (Anti D injection) available and affordable in various health care facilities, to meet the need of rhesus negative mothers as the high cost of anti-D is likely to negatively impact the attitude of the women towards the prevention of rhesus incompatibility. Rural healthcare providers should be trained on the issue of rhesus compatibility to enable them advice their

patients in the communities and villages appropriately, so as to improve their practices towards rhesus incompatibility prevention.

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