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# Addressing the Haemolytic Disease of the Fetus -*Arun To Ba Eje Omo Ninu Oyun Je* amongst Female Residents in Imota

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Abstract: Assessing pregnant women's awareness of Rh incompatibility is crucial to avoiding and treating issues related to this illness, as the rate of miscarriages among young women is alarming and requires immediate care. Because of the kind of Rhesus factor they have, women in Nigeria miscarry every three months. Due to a lack of knowledge, some of these mothers are not aware of this fetal hemolytic illness. Some women relate the health event to spiritual conditions, beliefs and traditions. Medical research has demonstrated that the primary cause of the miscarriages that occur every three months of pregnancy is the Rhesus factor that certain women possess. This study aimed at assessing the levels of awareness and knowledge of the Rhesus factor among women in Imota, Lagos State, to determine the extent to which health institutions' communication strategies contribute to women's understanding and awareness of Rh factor, to ascertain the knowledge level of Rh factor, its implications in pregnancy and to determine how well media advocacy works to inform female residents of Ikorodu Local Government Areas, which include Imota, Isiu, Ijede, and Bayeku. The results showed that female residents of the selected areas in Lagos State, have not received enough media attention regarding the fetal hemolytic illness. The findings showed that, though the level of awareness of the Rhesus factor among the women in the State was high, the knowledge level of the Rh compatibility issues on maternal and child health and its implications in pregnancy was low.

Keywords: Arun, Disease, Female, Fetus and Hemolytic

# I. Introduction

Hemolytic disease of the newborn or fetus is commonly diagnosed and managed by pediatric and newborn hospitalists. Severe cases, however, pose unique challenges for community hospitals without higher level neonatal intensive care units. This case highlights the challenges faced by pediatric hospitalists in the community and suggests a focused approach to management (Joy et al. 2022). Ifeoma et al. 2024), aver that despite the considerable influence of Rhesus factor incompatibility on maternal and fetal health outcomes, little is known about women's awareness and knowledge of the Rhesus factor in Imo State, Nigeria. With a theoretical framework built on the Health Belief Model, the study surveyed a sample of 385 respondents, drawn from a population of 2,688,605. The findings from the studies showed that the though the level awareness of the Rhesus factor among the women in the State was high, the knowledge level of the specificity of the Rh compatibility issues on maternal and child health and its implications in pregnancy was low.

The findings also correlate the low knowledge level with the nature of communication strategies employed by healthcare institutions and professionals in the State to diffuse information on the Rhesus factor among the women. The researchers therefore recommend that Health institutions and professionals should include Rhesus factor education for women during antenatal care; the State Ministry of Health should embark on awareness campaigns in the rural areas using society-specific communication strategies to improve knowledge of the Rh factor; Rhesus Factor education should be included in reproductive health education programmes for girls and young ladies (Airaoje et al., 2024).

Hemolytic disease of the newborn or fetus remains a significant health concern in Imota, Isiu, Ijede and Bayeku women. It is commonly diagnosed and managed by pediatric and newborn hospitalists. Severe cases, however, pose unique challenges for community hospitals without higher level neonatal intensive care units. Report says, Rhesus incompatibility arises in pregnancy when a woman is Rh negative (DD) and carries a fetus with Rh positive blood (DD or Dd), inheriting the D antigen from the father. If the husband is homozygous (DD), all offspring will be Rh positive. However, if he is heterozygous (Dd), each pregnancy has a 50% chance of producing a child with Rh negative. (Al-Kuran, et al., 2023). The likelihood of Rh-negative mother developing sensitivity to the Rh antigen increases if significant hemorrhage occurring during delivery, which can lead to isoimmunization.

This study is motivated by the urgent need to understand the factors driving hemolytic disease of the fetus amongst women in the select areas in Ikorodu local government and to evaluate the effectiveness of existing prevention and control measures. Studies have shown that adequate information on the disease is crucial for disease, yet many communities in Ikorodu lack access to information and adequate medical attention (Joy et al., 2022). By identifying gaps in information, access to medical care, and public health interventions, this research aims to provide evidence-based recommendations for policymakers, health organizations, and humanitarian agencies. Furthermore, studying hemolytic disease of the fetus in Ikorodu is crucial for developing targeted strategies to mitigate future miscarriages, protect at-risk populations, and strengthen the state's capacity to respond to health emergencies. The findings of this study will contribute to broader efforts to improve public health resilience in underprivileged areas, ensuring sustainable solutions for hemolytic disease of the fetus prevention and control.

## **1.1 The Basic Tools of Enquiry**

The research is guided by the following questions:

- 1. What are the primary factors contributing to the recurring hemolytic disease of the fetus in Ikorodu local Government Area?
- 2. What is the knowledge and awareness of rural women about hemolytic disease of the fetus?
- 3. How has Rhesus factor influenced the prevalence of miscarriages among women in Ikorodu Local government Area of Lagos State?
- 4. What specific intervention should government provide in order to mitigate hemolytic disease of the fetus in Ikorodu Local Government Area of Lagos State?

# **II. Review of Literatures**

In prenatal care, rhesus (Rh) incompatibility is a crucial factor that impacts maternal health, especially for Rh-negative pregnant women. This sensitivity also increases with other events during pregnancy and labour such as exposure to fetal Rh-positive blood, external cephalic version, invasive procedures like chorionic villus sampling or amniocentesis, ectopic or molar pregnancy, miscarriage, antepartum hemorrhage, trauma, and blood transfusions. (Irinmwinuwa, et al., 2023), noted that hemolytic disease of the fetus and newborn (HDFN), also known as erythroblastosis fetalis, is a complex and potentially life-threatening condition arising from maternal-fetal blood group incompatibility.

When a fetus inherits paternal blood group factors that are absent in the mother, antepartum or intrapartum fetal-maternal bleeding can provoke a maternal immune response. This immune reaction produces maternal antibodies, a process known as

alloimmunization, which can result in varying degrees of transplacental passage of these antibodies into the fetal circulation. Depending on the antigenicity and amount of antibodies involved, this transplacental transfer can lead to hemolytic disease in the fetus and neonate, presenting with complications including anemia, jaundice, and, in severe cases, hydrops fetalis or hyperbilirubinemia and kernicterus in the newborn.

Rhesus incompatibility arises in pregnancy when a woman is Rh negative (dd) and carries a fetus with Rh positive blood (DD or Dd), inheriting the D antigen from the father. If the husband is homozygous (DD), all offspring will be Rh positive. However, if he is heterozygous (Dd), each pregnancy has a 50% chance of producing a child with Rh negative. (Al-Kuran, et al., 2023). The likelihood of Rh-negative mother developing sensitivity to the Rh antigen increases if significant hemorrhage occurring during delivery, which can lead to isoimmunization. This sensitivity also increases with other events during pregnancy and labor such as exposure to fetal Rh-positive blood, external cephalic version, invasive procedures like chorionic villus sampling or amniocentesis, ectopic or molar pregnancy, miscarriage, antepartum hemorrhage, trauma, and blood transfusions. (Irinmwinuwa, et al., 2023).

Hemolytic disease of the fetus and newborn (HDFN), also known as erythroblastosis fetalis, is a complex and potentially life-threatening condition arising from maternal-fetal blood group incompatibility. When a fetus inherits paternal blood group factors that are absent in the mother, antepartum or intrapartum fetal-maternal bleeding can provoke a maternal immune response, Myle AK, Al-Khattabi GH, (2021). This immune reaction produces maternal antibodies, a process known as alloimmunization, which can result in varying degrees of trans placental passage of these antibodies into the fetal circulation. Depending on the antigenicity and amount of antibodies involved, this trans placental transfer can lead to hemolytic disease in the fetus and neonate, presenting with complications including anemia, jaundice, and, in severe cases, hydrops fetalis or hyperbilirubinemia and kernicterus in the newborn.

Despite significant advancements in the understanding and management of HDFN, the condition remains a significant cause of perinatal morbidity and mortality if left undiagnosed and untreated. However, with the advent of Doppler ultrasonography, noninvasive methods for managing alloimmunization in pregnant women have emerged, supplementing established protocols for HDFN management. These advancements offer a more thorough and less invasive approach to assessing fetal well-being, reducing risks to both the mother and fetus. Additionally, the intricate nomenclature of the Rh blood group system adds complexity to the management of Rh alloimmunization, necessitating a clear understanding of antigenic variants and their implications for clinical practice (Kemper AR, et al., (2022). Therefore, enhanced knowledge of the pathogenesis, prevalence, prevention, and management strategies of HDFN, as well as the importance of timely intervention and the role of evolving diagnostic techniques in improving outcomes for affected pregnancies (De Winter DP, et al., 2023).

## 2.1 Trends of hemolytic disease of the fetus in the Southwest

The Rhesus (Rh) factor is a collection of antigens that might be present or absent on red blood cells. This protein is located outside red blood cells and is inherited genetically from biological parents. Presence of protein on red cells indicates a person is Rh positive, which is the most common blood type in the Rhesus system (Nyakio, et al., 2024). Rhesus incompatibility arises in pregnancy when a woman is Rh negative (dd) and carries a fetus with Rh positive blood (DD or Dd), inheriting the D antigen from the father. If the husband is homozygous (DD), all offspring will be Rh positive. However, if he is heterozygous (Dd), each pregnancy has a 50% chance of producing a child with Rh negative (Al-Kuran, et al., 2023; Aliough et al., 2023).

It is important to stress the fact that women are the integral part of a nation and the force that bring about advancement in a given country. Women, a part from carrying out the duties of childrearing and childbearing that are essential to human social existence, they also give family members emotional and material assistance (Msughter et al., 2023). For instance, women are important members of the family, which is recognized as a fundamental social unit in all societies (Namadi & Aondover, 2020). A woman's right to health includes her right to a healthy childbirth and newborn, and the baby possesses his or her own right to life as well.

#### 2.2 The Role of the Media

The Mass media is classified as a "proven practice" by the United States Agency for International Development's High Impact Practices brief and is documented as being both impactful and cost-effective, although there are few studies which measure these outcomes in relation to young people (Sarah et al., 2019). In stating the obvious, the role of the media cannot be underestimated in any given society, as the media are the life wire or oxygen of any developmental initiative (Ate et al., 2017; Usman et al., 2022).

Djamila et al., (2024) posit that the mass media play an active role in disseminating health information and data to a wide audience. This information includes messages about disease prevention, treatment methods and the latest research and developments in the medical field. The media, according to Djamila et al, (2024), can motivate individuals and communities to take positive steps to improve their health. Health advocacy effects changes in health behaviors and outcomes through applying health promotion expertise to specific groups. Advocacy occurs through the provision of tools to empower those who are either experiencing, or at risk of, a particular health status, Milica Markovic, Lenore Manderson, (2008).

#### 2.3 Factors and Causes Contributing to hemolytic disease of the fetus in Nigeria

Socioeconomic factors like poverty, lack of education and lack of information significantly contribute to continuous miscarriages experience by our women in Nigeria. In the absence of adequate awareness about Rh issues, individuals may enter into marriage or even become pregnant without undergoing necessary screenings. Furthermore, there might be a disbelief in the existence of Rh incompatibility. Thus, empowering females with knowledge allows them to recognize and express their health needs, seek medical assistance, and make informed decisions regarding their health (Opara, 2023; Obada et al., 2024).

The nurse plays a vital role in enhancing pregnant women's awareness of Rh incompatibility by delivering precise and personalized information about the condition. Nurses' focus must lie in serving, protecting, advocating for, and empowering women. Moreover, they ensure women receive education on newborn care and demonstrate adequate knowledge of the condition's prognosis and its potential effects on their child (Obada et al., 2021; Kamei & Warrior, 2022). Rh incompatibility typically doesn't manifest with clinical signs and symptoms in the Rh-negative mother, while it can have significant consequences for the Rh-positive fetus. Some clinical indicators of hemolytic disease of the newborn (HDN) due to Rh incompatibility include scleral icterus, tachycardia, tachypnea, lethargy, pallor, jaundice, and hypotension (Obada et al., 2021).

Hydrops fetalis is a severe, life-threatening condition characterized by severe hemolytic anemia, presenting with at least two of the following signs; pleural effusions, edema, pericardial effusions, and ascites (Opara, 2023). To avoid sensitization, Rh-negative women should receive a single dose of RhIg, either 300 mcg or 1,500 IU, within 72 hours after birth. The use of RhIg prophylaxis significantly reduces the risk of Rh isoimmunization from 13.2% to 0.2%. (Maruta, et al., 2023). When a pregnant woman who is at risk for Rh

incompatibility, obstetrician gives her a series of two Rh immunoglobulin (RhoGAM) injection within 72 hours after delivery, after abortion, and around the 26th to 28th week of pregnancy. Rh immune-globulin acts as a vaccine, preventing the mother's body from producing Rh antibodies that could harm the newborn or future pregnancies. An extra dose may be advised after events that could cause Rh incompatibility (Irinmwinuwa et al., 2023).

#### **2.4 Theoretical Framework**

The research used Health Belief Model and Social Determinants of Health. The Health belief model is a theoretical model that can be used to guide health promotion and disease prevention programs. It is used to explain and predict individual changes in health behaviours (Rural Health Information Hub, 2024). It is one of the most widely used models for understanding health behaviour. Key elements of the Health Belief Model focus on individual beliefs about health conditions, which predict individual health-related behaviour. The model defines the key factors that influence health behaviour as an individual's perceived threat to sickness or disease (perceived susceptibility), belief of consequence (perceived severity), potential positive benefits of action (perceived benefits), potential barriers to action (perceived barriers), exposure to factors that prompt action (cues to action), and confidence in ability to succeed (self-efficacy) (Msughter et al., 2022).

On the other hand, the Social Determinants of Health, (SDH) refer to the non-medical factors that influence health outcomes. These include conditions in which people are born, grow, work, live, and age, as well as the wider set of forces and systems shaping the conditions of daily life. These determinants encompass socioeconomic status, education, neighborhood and physical environment, employment, social support networks, and access to healthcare (Airaoje et al., 2024). The World Health Organization (WHO) highlights that these factors are primarily responsible for health inequities-the unfair and avoidable differences in health status seen within and between countries (WHO, 2010). The Social Determinants of Health (SDH) theory has developed over time through contributions from various thinkers and organizations, rather than being attributed to a single individual or year. Early foundations were laid by Friedrich Engels in 1845, who linked poor living conditions to ill health (Engels, 1845), and Rudolf Virchow in 1848, who emphasized the impact of social and political factors on health (Virchow, 1848). The concept gained institutional recognition with the World Health Organization's (WHO) 1986 Ottawa Charter for Health Promotion, which highlighted the importance of social, economic, and environmental factors (WHO, 1986; Airaoje et al., 2023). Sir Michael Marmot further advanced the theory in 2008 through his leadership of the WHO Commission on Social Determinants of Health, culminating in the landmark report Closing the Gap in a Generation (WHO, 2008).

This evolution reflects the theory's interdisciplinary roots and its focus on addressing health inequities globally. The Social Determinants of Health theory underscores the importance of addressing structural and systemic factors to improve health outcomes and reduce inequalities (Ahmed & Msughter, 2022). While it holistic and equity-focused framework makes it a powerful tool for understanding and addressing health disparities, its practical application requires overcoming significant challenges, particularly in measurement and policy implementation (Aondover et al., 2025). Hence, the theory is used for this study.

## 2.5 Health Communication and its importance to Public Health

Djamila et al, (2024), explain that health communication is a specialised branch of communication that targets a specific audience and addresses a specific area with the aim of raising awareness, educating, changing behaviour and even adopting new behaviours. Health communication, works to provide the community with accurate news, sound health information, scientific facts and knowledge that contribute to the formation of a preventive

and therapeutic health culture. It involves four elements: the sender, the receiver, the message topic and the communication medium (Ben-Orns, 2010, p. 54; Hile et al., 2022). The relationship between limited health literacy and poor health may be due, in part, to poor communication quality within health care delivery organizations. We explored the relationship between health literacy status and receiving patient-centered communication in clinics and hospitals serving communication-vulnerable patient populations

## **III. Research Methods**

The study adopted a cross-sectional survey design, which focused on gathering data regarding the causes, effects, and solutions to the recurrent hemolytic disease of the fetus in Ikorodu Local Government Area of Lagos State. The survey collected quantitative data from community members to evaluate their knowledge, awareness, and practices related to the disease and its adverse effect on the health of the women in the select areas. The targeted population consist of residents in Imota, Isiu, Ijede, and Bayeku of Ikorodu in Lagos State, selected from various demographic groups to ensure comprehensive representation. A total of 360 population were served with copies of the questionnaire which were translated to the native language of the residents, but 355 were retrieved because 5 were marred. Participants were chosen based on the following inclusion criteria:

- a. Age: women from certain age groups (17+years) were eligible for participation.
- b. Occupation: Participants represented a mixed of occupational backgrounds including petty traders, health workers, businesspersons, civil servants, and students.
- c. Education: Respondents were categorized according to their highest level of education attained.
- d. Availability: Respondents were available and willing to complete the survey.

A stratified random sampling technique was employed to ensure the inclusion of a variety of demographic groups based on age, gender, occupation, and educational level. This enabled comparison of responses across different population segments and enhanced the representativeness of the data. Data was collected through a structured questionnaire with both closed and open-ended questions. The questionnaire was divided into four sections: This section captures basic demographic data such as age, gender, occupation, and education to help classify and analyze responses from different population groups. This section assessed the respondent's familiarity with hemolytic disease of the fetus, its causes, symptoms, and impact on the health of the women. This section focused on the rhesus factor incompatibility. This section investigated the effectiveness of public health programs, the preferred sources of medical care during ailment, and suggestions for improving the prevention efforts of the disease.

Quantitative data was analyzed using descriptive statistics to summarize and categorize responses. Statistical Package for Social Sciences (SPSS) was used for the analysis. The study adhered to ethical guidelines by ensuring informed consent, maintaining confidentiality of respondents, and allowing participants to withdraw at any stage of the survey without consequences. Ethical approval was sought from relevant institutional review boards to ensure the protection of participants. The study faced limitations related to self-reported data, where some participants provided socially desirable answers rather than truthful responses. Additionally, geographical constraints must have affected the ability to collect data from all areas of Imota, Isiu, Ijede, and Bayeku of Ikorodu in Lagos State. However, to mitigate these limitations, the survey was distributed to a representative sample across various locations, and efforts were made to ensure anonymity.

Table 1. Age group		
	Frequency	Percent
18-25	102	28.7
26-35	77	21.6
36-45	49	13.8
Above 45	31	8.7
Below 18	96	27.0
Total	355	100.0

#### **IV. Results and Discussion**

From table 1 above, the largest representation comes from young female adults (18-25 years) at 28.7% and ladies under 18 years at 27.0%. Together, these groups make up over half of the respondents. Adults aged 26-35 years (21.6%) and 36-45 years (13.8%) represent a significant portion, while women above 45 years represent (8.7%).

Table 2. Gender			
	Frequency	Percent	
Young female Adults	162	47.0	
Older women	193	53.0	
Total	355	100.0	

Table 2 indicates gender. Older women outnumber younger ladies, with 53% of respondents identifying as older women and 47% as young ladies. This shows that the older women experience more miscarriages than the younger women in the sample.

Table 3. Occupation		
	Frequency	Percent
Petty Traders	65	18.3
Farmers	181	51.0
Civil Servants	62	17.5
Contract staff	47	13.2
Total	355	100.0

Table 3 shows the various occupations of the respondents. Farmers dominate the sample, comprising 52.5% of the respondents, followed by businessperson (18%) and students (15.9%). Civil servants make up a smaller portion of the group (13.6%), indicating that agriculture is the leading occupation in this community.

Table 4. Level of education			
Frequency Percent			
No formal education	166	48.1	
Primary	102	29.6	

Secondary	54	15.7
Technical College	23	6.7
Total	355	100.0

Table 4 indicates the educational level of the respondents. A significant portion of respondents (48.1%) have no formal education. This is followed by those who have completed primary education (29.6%), and a smaller group with secondary education (15.7%). Only 6.7% of respondents have attended tertiary education, suggesting a low level of higher education within this population.

	Frequency	Percent
Rh-negative blood	113	32.0
Irregular menstruation	71	20.0
Baby's incompatible red blood cells	72	20.2
Infections	53	15.0
I don't know	46	12.8
Total	355	100.0

**Table 5.** Main cause of hemolytic disease of the fetus

Table 5 above reveals the respondents' knowledge on the causes of hemolytic disease of the fetus. The primary cause of hemolytic disease of the fetus is most commonly understood to be Rh-negative blood (32.0%), with a significant number also associating the disease with irregular menstruation (20.0%), baby's incompatible red blood cell stands at (20.2%), 15. answering infections 15.0% and 12.8% answering "I don't know." Airaoje et al., (2023) affirm that poor sanitation and lack of proper care necessitate some of the disease women are facing in the society.

	Frequency	Percent
Cramping in Pelvic Area	97	28.1
Spotting	103	29.9
Breast tenderness	57	16.5
Fever	88	25.5
Total	355	100.0

Table 6. Common symptoms of hemolytic disease of the fetus by the respondents

Table 6 shows recognition of symptoms of hemolytic disease of the fetus by the respondents. The most recognized symptoms are Cramping in Pelvic area (28.1%) and Spotting (29.9%). A smaller percentage of people are aware of fever (25.5%) and breast tenderness (16.5%) as symptoms. Hile et al., (2022) are of the view that awareness of people on their health issues are significantly important and the media can bridge this gap by constant disseminating of information to the people.

 Table 7. Access to proper health care

	Frequency	Percent
Yes	109	31.6

No	236	68.4
Total	355	100.0

Table 7 shows access to health care facility. Most respondents (68.4%) lack access to health facilities while 31.6% have access to health care. Therefore, this indicates a significant health care issue within the community.

**Table 7.** Measures needed to be taken by the government to prevent hemolytic disease of the fetus amongst rural women

	Frequency	Percent
Produce media campaign	107	31.0
Promote hygiene	73	21.2
Provide sensitization workshop	59	17.1
Increase vaccination campaigns	106	30.7
Total	355	100.0

Table 7 shows government measures for hemolytic disease of the fetus. The most commonly suggested government measures to prevent hemolytic disease of the fetus include increasing vaccination campaigns (30.7%), promoting hygiene (21.2%), producing media campaigns and providing sensitization workshop (17.1%). Msughter et al., (2023) also observed that media campaigns are very imperative in creating awareness to people for proper hygiene.

	Frequency	Percent
Yes	86	24.2
No	153	43.1
I don't know	116	32.6
Total	355	100.0

 Table 8. Those vaccinated against miscarriages

Table 8 reveals the status of the respondents on cholera vaccination. A significant portion of respondents (44.3%) has not been vaccinated against cholera, with 33.6% unsure of their vaccination status. Only 22% have received the vaccine. Msughter and Phillips (2020) maintained that vaccination is fundamental and the media have a role to play by ensuring that people are encourage to go out for vaccination, especially during the Covid-19 pandemic.

#### V. Conclusion

Based on the findings, the study concludes that addressing Haemolytic Disease of the Fetus (HDF) requires a comprehensive approach that integrates early detection, preventive strategies, and advanced medical interventions. The implementation of routine antenatal screening for maternal alloimmunization, alongside the timely administration of Rh immunoglobulin, has significantly reduced the incidence of this condition. However, ensuring widespread access to these preventive measures remains crucial, particularly in low-resource settings. Continued advancements in intrauterine transfusions, immunotherapy, and neonatal care further enhance survival rates and health outcomes for affected infants.

Collaborative efforts between healthcare providers, researchers, and policymakers are essential to closing existing gaps in care and ensuring that every pregnancy receives the necessary medical attention. By prioritizing education, awareness, and equitable healthcare access, the burden of HDF can be significantly minimized, improving maternal and neonatal health worldwide.

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