Original Research Article

Prevalence of rhesus negative pregnancy and comparison to its prevalence in previous decade

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Abstract

Background: Hemolytic disease of newborn (HDNB) secondary to rhesus D (Rh D), isoimmunization contribute significantly to perinatal mortality and morbidity.

Aim: The objective of the study was to determine the prevalence of Rh negative pregnancy for a period of one year i.e. June 2018 to May 2019 and comparison of prevalence of Rh negative pregnancy in previous decade i.e. June 2008 to May 2009.

Materials and methods: A two year retrospective study of rhesus negative pregnant woman was carried out at tertiary care centre in King George Hospital, AMC, Visakhapatnam in year 2018-19 and 2008-09 respectively. We observed prevalence, mode of delivery, perinatal outcome in form of gestational age at delivery, NICU admission and IUD.

Results: In this study, among 5028 deliveries in the year 2008-09, Rh positive women were 4940 i.e. 98.2% and Rh negative women were 88, hence, prevalence was 1.8%. While in year 2018-19 among 6542 deliveries, Rh positive women were 6238 i.e. 95.4%and Rh negative women were 304 contributing to prevalence of 4.6%.

Conclusion: The Prevalence of Rh D negative pregnancy determination increased when compared with its prevalence 10 years back. This is because of increased antenatal care at various health care centre and easy accessibility of health care services. There is need for adequate counseling of pregnant women on importance of Rh D negative factor during antenatal period in order to prevent HDNB.

Key words

Prevalence, Rhesus negative, Pregnancy, Previous decade.

Introduction

Rhesus antigen was first discovered in rhesus monkey. Rhesus antigen was first named after monkey Macacus rhesus with who about 85% human share this red cell antigen. Incidence of A Rh negative pregnancy in western countries is 15% but in India it varies from 3% to 5.7 %. It is high risk pregnancy as it causes antigen antibody reaction and causes hemolysis. It leads to prenatal loss of 1% to 2.5%. The genetic loci for Rh antigen are located in short arm of chromosome 1 [1].

The AB and Rhesus factor Rh D antigen are recognized as major blood group antigen present in red blood cells. In 1900 the A, B, and O type were determined by Karl Landsteiner. Rhesus blood group system was the fourth system to be discovered by Landsteiner and Alexander Swiener in 1937. The presence of Rh factor a protein in the red cell surface constitute Rh positive person while its absence indicates Rh negative person. Dr. Philip Levine made connection between Rh factor and incidence of erthyoblastosis fetalis. Hemolytic disease of new born secondary to rhesus D isoimmunization contributes significantly to perinatal morbidity and mortality. Maternal Rh D alloimmunization occurs as a result of maternal immune system exposed to Rh positive blood cells in Rh negative women [2]. Once anti D Ig antibodies present in pregnant woman they cross placenta opsonization of fetal RBC which undergo phagocytosis lead to hemolytic disease of new born ranging from hyperbilirubinemia, severe anemia, Hydrops fetalis [3].

Aim of the study

The objective of the study was to determine the prevalence of Rh negative pregnancy for a period of one year i.e. June 2018 to May 2019 and comparison of prevalence of Rh negative pregnancy in previous decade i.e. June 2008 to May 2009.

Materials and methods

Data regarding the blood group and details of women, who delivered at King George Hospital, Visakhapatnam in year 2018-19 and 2008-09 respectively were retrieved from parturition register and results were analyzed and compared. The ABO blood group and Rh D factors were part of routine investigations done who delivered in KGH. The age at delivery, previous obstetric history, gestational age at delivery, method of delivery, outcome of delivery were noted from the records.

Results

Women who delivered at king George hospital were included in this study for a period of one year from June 2018- May 2019 and June 2008-May 2009 respectively.

Table - 1 Shows total no of deliveries conducted in year 2008-09 were 5028, among which Rh positive pregnancy were 4940 (98.2%) while Rh negative pregnancy were 88 (1.8%) while in year 2018-19 were 6542 Rh positive pregnancy were 6238 (95.4%)and Rh negative pregnancy were 304 (4.6%).

Prevalence in our study was almost similar to other studies [2, 3, 6, 7] (**Table – 2**). In our study the prevalence o blood group was more common followed by B blood group in year 2018-19 and 2008-09 (**Table – 3**). Highest incidence found in age group 23-26 years 41.5% in year 2018-19 while in year 2008-09 in age group 18-22 was 45.5% and >30 years 4.6% and 3.4% respectively (**Table – 4**).

In our study, primigravida showed highest distribution i.e. 52.3%, 50.3% in year 2008-09 and 2018-19 respectively (**Table – 5**). Most of them delivered in gestational age 38-40 weeks in 2018-19 and 2008-09 (**Table – 6**).

Table – 1: Total no of deliveries conducted.

	2018 -2019 (%)	**2008 -09 (%)**
Total no of deliveries in year	6542	5028
Total no of Rh positive pregnancy	6238 (95.4%)	4940 (98.2%)
Total no of Rh negative pregnancy	304 (4.6%)	88 (1.8%)

Table – 2: Prevalence in other studies.

Name of study	**Prevalence**
E.A Nagamuthu, et al. (2014-2015) [2]	4.29%
Okeke TC, et al. (2004-2005) [6]	4.50%
Jamila Khatun and Ruly Begum, et al. (2013-14) [7]	2.83%
Gorle Rama Devi, et al. (2014-15) [3]	4.26%
Prevalence in my study	4.60%

Table - 3: ABO blood group distributions.

Blood Group	**2018-19**	**%**	**2008-09**	**%**
O	131	43.0	41	46.5
A	72	23.6	16	18.4
B	84	27.6	28	31.8
AB	17	5.5	3	3.6

Table - 4: Age distribution among Rh negative pregnant patients.

Age group (years)	**No of patients 2018-19 (N=304) (%)**		**No of patients 2008-09 (N = 88) (%)**	
18 - 22	62	20.4%	40	45.5%
23 -26	126	41.5%	29	33%
27 -30	102	33.5%	16	18.2%
>30	14	4.6%	3	3.4%
Total	304	100%	88	100%

Table - 5: Distribution of parity among Rh negative pregnant patients.

Parity	**No of patients 2018-19 (%)**		**No of patients 2008-09 (%)**	
Primi gravida	153	50.3%	46	52.3%
Second gravida	116	38.3%	37	42.0%
Third gravida	24	7.8%	2	2.3%
Multi gravida	11	3.6%	3	3.4%
Total	304	100%	88	100%

Majority delivered through vaginally followed by LSCS in 2018-19 and 2008-09, while instrumental deliveries were also decreased in comparison with 2008-09 (**Table – 7**). Perinatal outcome among Rh negative pregnant patients was as per **Table – 8**.

Discussion

In our study, the total no of deliveries conducted in year 2008-09 were 5028, among which Rh positive pregnancy were 4940 (98.2%) while Rh negative pregnancy were 88 (1.8%). While in year 2018-19, total no of deliveries conducted

were 6542, among which Rh positive pregnancy were 6238 (95.4%) and Rh negative pregnancy were 304 (4.6%). This indicates that there is increase in tertiary hospital delivery among Rh negative women due to non-availability of negative blood group at PHC. There is also increase in antenatal care at various health centres and easy accessibility of health care services.

Table - 6: Gestational age at delivery among Rh negative pregnant women.

Gestational age at delivery	**No of patients in year 2018-19 (%)**		**No of patients in year 2008-09 (%)**	
< 30 weeks	2	0.8	---	---
31 to 34weeks	8	2.8%	2	2.2%
35 to 37 weeks	54	17.7%	13	14.7%
38 to 40weeks	192	63.0%	50	56.8%
>40 weeks	48	15.7%	23	26.1%
Total	304	100%	88	100%

Table - 7: Method of delivery among Rh negative pregnancy.

Method of delivery	**No of patients year 2018-19 (%)**		**No of patients year 2008-09 (%)**	
Vaginal delivery	147	48.4%	52	59.1%
Instrumental delivery	23	7.6%	8	9.1%
LSCS	134	44.1%	28	31.8%
Total	304	100%	88	100%

Table - 8: Perinatal outcome among Rh negative pregnant patients.

Peri natal outcome	**No of patient year 2018-19 (%)**		**No patients year 2008-09 (%)**	
Healthy baby	287	92.9%	78	86.6%
NICU admission	16	5.1%	7	7.8%
Perinatal mortality	2	0.64%	2	2.24%
IUD	4	1.3%	3	3.3%
Total	309 (twins - 5)		89 (twins - 2)	

The present study findings were compared with the previously published relevant studies [4, 5]. The study conducted by Enugu south east Nigeria in year 2004-05 is 4.5 % [6]. Another study conducted in year 2014-15 by E.A. Nagamuthu, et al. [2] is 4.29%. The other study conducted in year 2013-14 by Jamilia khatan and Ruly Begum is 2.54% [7].

In our study, the prevalence O blood group is more common followed by B, A and AB blood group in year 2018-19 and 2008-09 respectively.

The highest incidence was found in age group 23-26 years (41.5%) in year 2018-19 while in year 2008-09 in age group 18-22 is 45.5% and >30 years 4.6% and 3.4% respectively. This indicates delayed in marriage and increased career oriented among females.

In our study, primigravida showed highest distribution i.e. 50.3% and 52.3% in year 2018-19 and 2008-09 respectively. Proper and adequate management among these females should be done to avoid complications in future pregnancy.

Most of them delivered in gestational age 38-40 weeks in 2018-19 and 2008-09. Majority delivered through vaginally followed by LSCS in

2018-19 and 2008-09, while instrumental deliveries were also decreased in comparison with 2008-09.

Rhesus isoimmunization is preventable cause of fetal morbidity and mortality. All pregnant women as soon as pregnancy is diagnosed should be checked for blood grouping and typing if negative, husband blood grouping and typing to be done if positive ICT to be done to diagnose the antibody titre. After delivery baby's blood group and typing, hemoglobin, DCT, bilirubin, and reticulocyte counts should be done to monitor baby postnatal, so that baby can get early treatment for raised bilirubin. Recommends antenatal and postnatal prophylaxis - Single dose 300 mcg at 28 weeks followed by post natal prophylaxis by 300 mcg as soon as possible, if baby is Rh positive and DCT negative, 100 mcg Anti D after sensitizing event of the first trimester.

Family planning should encourage for immunized women since the sensitivity of hemolytic disease increases with increase in parity.

Conclusion

The prevalence of Rh D negative women in year 2008-09 is 1.8% while in year 2018-19 is 4.6%. This indicates that there is increase in tertiary hospital delivery among Rh negative women due to non-availability of negative blood group at PHC. There is also increase in antenatal care at various health centres and easy accessibility of health care services. Even though the prevalence of Rh negative pregnancy is low <5% but Rh isoimmunization remains most determining factor for perinatal mortality in most developing countries. Primary aim in caring Rh negative women is prevention of alloimmunization. In India even though cost of Anti –D is high, there is free supply by government of India thereby reducing risk of isoimmunization. The knowledge of blood group and Rh factor is important in evolution related to disease, essential in blood transfusion, organ transplantation and also helps to prevent compilations due to Rhesus incompatibility.

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