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Maternal and Foetal Outcome in RH Negative Pregnancy AT A Tertiary Care Centre

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ABSTRACT

Rh Negative pregnancy is a high risk pregnancy. Rh Incompatibility is exposure of Rh Negative mother to Rh Positive fetal blood during pregnancy or delivery leading to maternal antibody formation against foreign Rh antigen that cross placenta and destroy Rh positive fetal erythrocytes resulting in fetal Alloimmune Induced Haemolytic Anaemia. There are many fetal and maternal complications due to Rh Negative pregnancy. So Anti-D Immunoglobulin should be given within first 72 hrs of delivery/sensitizing event. Prophylactic antenatal Anti-D Immunoglobulin is given at 28 weeks. Aim of the Study is to assess the Incidence, Maternal and Perinatal outcomes in Rh Negative Pregnancy. This was a Prospective Study done in 60 cases, over a period of 1 year at ACSR Government General Hospital, Nellore, Andhra Pradesh, India. In our study Prevalence of Rh Negative Pregnancy was 2.36%.Highest Prevalence was found to be in 21-25 yrs age group. Most common blood group was O Negative (51.6%), followed by B Negative (25%). 41.66% were Primi which predominated. Risk factors that were associated were Preeclampsia (6.6%), Gestational Diabetes Mellitus (1.66%), Polyhydramnios (5%), Oligohydramnios with Intrauterine Growth Retardation (3.34%). 70% mothers had Normal Vaginal Deliveries. 25% underwent Caesarean Section. Live births were 96.6%., Still birth1.6%, Intrauterine Fetal Demise 1.6%. One early Neonatal death was reported. Majority of newborn APGAR Score was 10 with 78.3%. Of 60 mothers 40% mothers took Antenatal Prophylaxis., which needs to be improved. All mothers of babies with Rh Positive blood group were given Postnatal Prophylaxis. So there must be increased awareness among doctors and patients about Antenatal Prophylaxis at 28 weeks or after any sensitizing event.

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Key Words

Rh negative pregnancy, anti D prophylaxis, fetal and maternal complications

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INTRODUCTION

Rh Negative pregnancy is a High Risk pregnancy. Rh Isoimmunisation remains a significant problem as it contributes to perinatal morbidity and mortality that include Haemolytic Disease of Newborn, Neonatal Jaundice, Anaemia, Still Births, Intra Uterine Deaths.

Rh Incompatibility is exposure of Rh Negative mother to Rh Positive fetal blood during pregnancy or delivery leading to maternal antibody formation against foreign Rh antigen that cross placenta and destroy Rh Positive fetal erythrocytes resulting in fetal Alloimmune Induced Haemolytic Anaemia. Global estimate of neonatal mortality associated with Rh disease in 2010 was 84 per 1 lakh live births[1].

Rh disease accounts for 97% of Haemolytic Disease of the Newborn (HDN), remaining 3% is caused Isoimmunisation against other fetal antigenic groups such as Kell, non-D Rh, Duffy, Kidd and MNS[2]. HDN is preventable disease when measures to prevent Feto Maternal Haemorrhage are taken and Antenatal and Postnatal Immunoprophylaxis with Anti-D Immunoglobulin (Ig) are practised correctly[3].

HDN due to Rh Isoimmunisation is yet a significant health problem in India. The Incidence of Rh sensitization during pregnancy is 1-9% and perinatal loss due to Rh Alloimmunization has been reported to be between 1% and 2.5%. Risk of Isoimmunisation decreased to 1.5% by Postnatal Anti-D Prophylaxis and to 0.18% by additional Routine Antenatal Anti D Prophylaxis (RAADP)[4].

The Incidence of Rh Negative blood group is highest among Basques that is 34%. It is 13% among Caucasians, 7% among African American and 1% among Americans, Chinese and other Asian peoples. The Incidence of Rh Negative blood group in India varies between 3% and 5.7 %(hospital statistics)[5] and about 6 cases/1000 live births[6].

Anti-D Immunoglobulin should be given within first 72 hrs of delivery/sensitizing event. Prophylactic Antenatal Anti-D Immunoglobulin is given at 28 weeks[7]. Despite the introduction and widespread use of Immunoglobulin of prevention of Haemolytic Disease of Newborn (HDNB), Rh Alloimmunization remains a significant problem in Perinatology.

Fetal consequences of Rh Incompatibility-Hydrops Fetalis, Icterus Gravis Neonatorum, Congenital Anaemia of Newborn, Haemolytic Disease of Newborn[8], Still Births, Intra Uterine Fetal Demise, IUGR. Maternal consequences of Rh Negative pregnancy-Polyhydramnios, Oligohydramnios, Pre-eclampsia, Big size baby with its hazards, Hypofibrinogenemia due to prolonged retention of dead fetus, Post Partum Haemorrhage.

The prevention of Rh Alloimmunization is the responsibility of all health care workers., the management of Alloimmunized pregnancies requires specialized care.

Aims and Objectives: To assess the Incidence, Maternal and Perinatal outcome in Rh Negative Pregnancy.

MATERIALS AND METHODS

This was a Prospective Study done in 60 cases, for a period of one year, at ACSR Government General Hospital, Nellore, Andhra Pradesh, India.

Inclusion Criteria: Pregnant women of any age/ parity with Rh Negative blood group.

Exclusion Criteria: Pregnant women with Chronic Hypertension or Diabetes, women with Rh Positive blood group.

Complete history taking and physical examination was done. Previous pregnancy Postnatal Anti D Ig Prophylaxis, present pregnancy Antenatal Prophylaxis at 28 weeks was noted. Babies' needing Neonatal Intensive Care Unit admissions in view of Neonatal Complications were followed.

Investigations that were done were Haemoglobin, Blood Grouping and Rh Typing and Rh D Factor screening of mothers, Husband Blood Grouping and Typing, Indirect Coombs Test (If Negative-Inj. Anti-D Prophylaxis was given and followed up. If positive-Antibody Titres were followed. If Antibody titres <1:16 weekly follow up of titres done)[9,10]. Amniocentesis, Optical Density Spectrophotometric Analysis, Doppler study of Middle Cerebral Artery for Peak Systolic Velocity was done. Cord Blood was collected for Blood Grouping, Direct Coombs Test, HB and Serum Bilirubin.

RESULTS AND DISCUSSIONS

ICT test was found to be Negative in 98.2 % of Rh Negative mothers Middle Cerebral Peak Systolic Velocity Doppler Study was followed in 1pregnantwoman with ICT positive which was> 1.5 MoM. Amniocentesis-optical density, Spectrophotometric analysis was done.

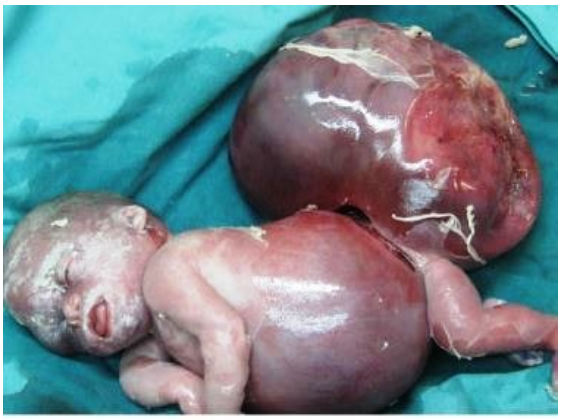

Fig. 1: Hydrops Fetalis Due to RH Alloimmunization

Table 1: Age wise distribution in rh negative pregnancy

Age in yrs	No.of cases (n=60)	Percentage
15-20 yrs	12	20%
21-25yrs	38	63.34%
26-29yrs	6	10%
>30yrs	4	6.66%

Table 2: Parity wise distribution

Parity	No. of cases n=60	Percentage
Primis	25	41.66%
Gravida 2	22	36.66%
Gravida 3	8	13.34%
> gravida 4	5	8.34%

Table 3: Blood group wise distribution

Blood group	No. Of cases n=60	Percentage
A negative	9	15%
B negative	15	25%
Ab negative	5	8.34%
O negative	31	51.66%

Table 4: ICT wise distribution

ICT	No. of cases n=58	Titres
Negative	57	-
Positive	1	1:16

Table 5: Maternal outcome

Maternal outcome	No. of cases n=60	Percentage
Pre eclampsia	4	6.66%
Gdm	1	1.66%
Polyhydramnios	3	5%
Oligohydramnios	2	3.34%

Table 6: Modes of delivery

Mode of delivery	No.of cases n=60	Percentage
Normal delivery	42	70%
Forceps delivery	2	3.34%
Lscs	15	25%
Preterm	1	1.66%

Table 7: Perinatal outcome

Perinatal outcome	No.of cases n=60	Percentage
Live births	58	96.66%
Still births	1	1.67%
Iuds	1	1.67%

Table8: Apgar score of babies

Apgar score	No. of cases	Percentage
0	2	3.33%
1-4	1	1.67%
5-8	1	1.67%
8-10	9	15%
10	47	78.33%

Table 9: Birth weight wise distribution

Birth weights	No. of casesn=60	Percentage
<2.5kgs	12	20%
2.5-3kgs	32	53.3%
3-3.5kgs	14	23.3%
>3.5kgs	2	3.31%

Table 10: Cord blood group wise distribution

Blood group	No. of cases n = 58	Percentage
Rh positive	46	79.31%
Rh negative	12	20.69%

Table 11: Cord blood bilirubin wise distribution

Serum bilirubin levels	No. of cases n=58	Percentage
<12mg/dl	44	75.86%
13-19 mg/dl	13	22.42%
20-25 mg/dl	1	1.72%

Table 12: Distribution of hb% cord blood

Cord blood hb%	No. of cases n=58	Percentage
<13 gm %	17	29.31%
14-20 gm %	41	70.69%

Table 13: Timing of admission after delivery

Timing of admission after delivery	No. of cases	Percentage
< 24 hrs	1	8.33%
1-3rd day	7	58.34%
4-6th day	4	33.33%
Total (n)	12	

Table 14 : Comparision of perinatal outcome

Perinatal outcome	Gandhi memorial hospital a.a study	Rajendra institute of medical sciences	Present study
Live births	61.5%	94%	96.66%
Still births	6.8%	-	1.6%
Neonatal deaths	-	3.3%	1 early neonatal death
Iuds	abortions -22.4%	2.7%	1.6%

Table 15: Comparision of apgar

Apgar	Sradha *et al* 2013	Present study
<5	10/24-ict+vebabies	1/1-ict +ve baby
<5	5/126-ict-ve babies	1/58-ict-ve babies

ICT negative babies had better apgar scores.

Table 16: Comparision of apgar in relation to ICT

	ICT Postive	ICT negative	Marginal row totals
Apgar <5	1	1 [1.67%]	1 (1.67%)
Apgar >5	0	57	57 (98.2%)
Marginal column totals	0	58	(Grand total)

Table 17: Raadp administration rates

Study(2005)	Raadp utilization rate%
Usa	41%-44%
England wales	74%
Scotland	72%
Present study	46.6%

Table 18: Relationship between raadp and neonatal jaundice

	Jaundice	No jaundice	Marginal row
Anti-d given	1	23	24
Anti-d not given	6	18	24
Marginal column	7	41	48

Perinatal Complications: Direct Coombs Test was positive in 1 baby. Out of 58 babies, 12 had complications and admitted in Neonatal Intensive Care Unit, Neonatal Jaundice in 7 (58.34%), Anaemia in 3 (25%), Respiratory Distress in 1(8.33%), Sepsis in 1(8.33%) and Neonatal Jaundice being the most common complication-58.34%.

India is a country with diversities based on races, religion and creed, hence diversity in distribution of Blood Groups. In India, Incidence of Rh Negative Pregnancy is 5-10%, even though Incidence is <10%, handling an Isoimmunised child is a challenge.

In our study period 0f one year, Prevalence of Rh Negative Pregnancy was 2.36%. Our finding was consistent with previous reports obtained in Guinea-4.1%, Enugu, South East Nigeria-4.5%Other studies Incidence was found to be Shubra Agarwal, Mahaveer College and Research, Up-1.38%, Rajavathi Hospital-0.31%

Highest Prevalence was found to be in 21-25 yrs age group, 63.34% as many couples plan family during this age group. Most common blood group O Negative (51.66%), followed by B Negative (25%), followed by A Negative (15%) and followed by AB Negative (8.34%).

The study from Enugu, SE Nigeria, showed most common blood group with Rh Phenotype was O Negative (64.5%).Most common blood group in each study was O Negative.

In present study Primis were 41.66%, Gravida 2 were 36.6% and Gravida 3 were 13.3%. In Gandhi Memorial Hospital A.A, May 2015 study Primis were 48.5%, Gravida 2 and Gravida 3 were 51.5%.

Out of 60 cases., 4 cases were associated with Preeclampsia (6.66%), 1 case associated with Gestational Diabetic Mellitus(1.66%), 3 cases were Polyhydramnios (5%), 2 cases were Oligamnios with Intra Uterine Growth Retardation. (3.34%). 70% mothers had normal vaginal deliveries and 25% underwent operative delivery. According to South India, G.R. Devi Study nearly 60.37% had normal vaginal deliveries and 31.92% delivered by Caesarean Section.

Manifestation of affected baby depends on the severity of Isoimmunisation. Isoimmunization was found to be significantly associated with mothers who did not have Anti D administration in previous pregnancies, P value being <0.05.5min APGAR is <5-1.6%. 5 min APGAR score was significantly good in immunized pregnant women.

According to Gandhi Memorial Hospital, A.A, MAY 2015-The relationship between Indirect and Direct Coomb's Test Bivariate analysis was conducted by using cross tabs, Chi square test =146.65 and the p value is<0.001 with 95% CI-0.000-0.000. Majority of newborn APGAR was 10 with 78.33%.

Out of 58 babies, 7 babies were admitted in NICU in view of Jaundice. Out of which 1 baby was Direct Coomb's Test positive and Mother had Indirect Coomb's Test Positive. This baby underwent Exchange Transfusion and Double Surface Phototherapy and survived. Another one baby had Bilirubin levels more than 21mg/dl died after 7 days with Hyperbilirubinaemia. Respiratory distress was observed in 1 baby. According to study by Sultan Qaboos University, Omani-Jaundice in 53% and Respiratory Distress in 28%

Despite Prevalence of Rh Negative pregnancy being 2.36%, handling of Isoimmunized child is challenging. Point of administering Antenatal Prophylaxis at 28 weeks should be given importance as it accounted to only 46.6%.

Chi-square statistic-4.1812 . p-value-0.040875. result is significant as p<0.05.Anti D is protective against Foeto Maternal Haemorrhage and reducing the Incidence of Neonatal Jaundice. Despite Prevalence of Rh Negative pregnancy being 2.36%, handling of Isoimmunized child is challenging.

CONCLUSION

Over the 20th century, Rh Alloimmunization was clinically recognized, its Pathophysiology was understood, its treatment was established and preventive measures were created to eliminate it. Unfortunately, the Incidence of this disease is decreasing at a very slow pace in India, in part because of lack of medical information and in part because of the high cost of medication used to prevent it.

Rh Negative mother should be counselled about the importance of Rh Immunoprophylaxis and Haemolytic Disease of Newborn. Routine Antenatal prophylaxis with 300 mcg at or around 28th weeks or 100 mcg at 28th and 34th weeks followed by 300 mcg within 72 hrs of delivery is recommended.

There should be increased awareness of RAADP and Prophylaxis after MTP, Abortion, Ectopic Pregnancy, etc., which is still lacking according to present study. Family Planning should also be encouraged for Immunized women since the severity of Haemolytic Disease increases with consecutive pregnancies.

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