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*Original Article*

# A Clinical Study – Pregnancy In Rh Negative Woman in Combined Military Hospital, Chattagram

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**Abstract**

***Background :*** *Prevention of rhesus immunisation in Rh(-) mothers and there by the prevention of Rh haemolytic disease in newborn is an integral part of modern obstetric. The morbidity and mortality from Rhesus incompatibility can be reduced by the use of modern obstetric techniques. The main objective of this study was to observe the outcome of pregnancies in rhesus negative women whose husbands were rhesus positive.*

***Methods :*** *This cross sectional type of descriptive study was carried out in combined Military Hospital, Chattagram from July 2014 to July 2016.*

***Results :*** *In this period total obstetrics admission was 3881. Rh(-) patient was 70 . Study carried out on 52 patient.*

*Incidence of rhesus immunisation was 1.8%. Antibody was detected in 9.6% cases. 75% cases received postpartum Rh Anti-D immunoglobulin and 4.2% cases received antepartum Anti 'D' imunoprophylaxis. 60% of affacted babies received exchange transfusion. Foetal loss was 20%.*

***Conclusion :*** *Rh incompatibility creates so many unwanted complications. We can prevent it in some extent by regular ANC, to educate the patient and taking some prophylactic measures.*

***Key words:*** *Pregnancy, Rh Negative*

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**Introduction :**

For the most clinical propose it is convenient to know human being in Rh(+)ve or Rh(-)ve. The major importance of Rh system for human health is to avoid the danger of RhD incompatibility between mother and fetus. The Rh discovery had immediate practical importance because it explained a relatively common medical disorder known as erythroblastosis fetails. In this condition, an Rh- negative women who becomes pregnant with an Rh-positive fetus (an unborn child) sometimes develops anti-bodies against the Rh factor in the fetus. This development usually causes no problem during the woman's first pregnancy, since the number of anti-bodies produced tends to be small.

By the time a second pregnancy occurs, the situation has changed. The number of Rh antibodies produced by the mother's body has become large enough to cause destruction of red blood cells in the fetus. This can result in complications such as anemia (a chronic blood condition characterized by lack of energy), jaundice (a condition in which bile pigments build up in the blood and cause skin, eyeballs and urine to take on a sickly yellow tone) or premature birth [1].

The incidence of Rh negativity is 15-16% in Caucasians and it is almost nil in mongoloid

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races [2,3,4]. In Bangladesh approximately 2.56% of the populations are rhesus negative [4]. The antibodies giving rise to haemolytic disease of the newborn (HDN) most commonly belongs to the Rh or ABO blood group system.

The morbidity of Rh HDN is explained by the great immunogenicity of the D antigen of the Rh system. Of all infants affected by Rh HDN10-20% died in utero or in the early neonatal period before effective therapy was possible. The disease due to anti -D is more severe than that due to most other allo-antibodies (eg anti-c,-E) except for anti K [1,3,5].

The over all risk of isoimmunisation for an Rh positive ABO-compatible infant with an Rh negative mother is about 16%. Of these 1.5-2% of reactions will occur in ante partum, 7% within 06 months of delivery and the remainder (7%) early in the second pregnancy. The incidence of Rh-isoimmunisation in Rh positive ABO incompatible foetus is 1.5-2%.[1]

Many factors influence whether a mother will become sensitized or not. These include timing, extent and number of episode of foeto maternal haemorrhage , the level of antibody production in the mother and the ABO status of the mother and foetus[6].

There are number of predispositions to fetomaternal Haemorrhage, including spoutaneous or induced abortion, amnio-centesis, abdominal trauma, APH, foetal death, multiple pregnancy, manual removal of placenta and cesarean section, amniocentesis chorionic villus samplings, foetal cordblood sampling. [7,8,9].1 ml of foetal blood entering the maternal circulation is critical sensitizing volume. [10]

The incidence of immunization during the second and subsequent Rh positive pregnancies is about 17% whereas it is less than 1% during antepartum period of the first Rh positive pregnancy. [11]

If prophylactic anti-D is given it will fail to protect the already immunised persons (which is not detectable serologically) and may be the cause of protection failure. With second exposure the antibody response will be rapid and strong and detected serologically.[10,12]

It is now widely accepted that antenatal administration of anti-D would prevent immunisation for virtually all. Besides the routine indications for prophylaxis a fail safe policy is a global strategy of a 2-dose regime, with one antenatal and one postnatal dose. This study had been conducted to gain information related to morbidity and mortality in such cases and to plan their management thereof in our community.

(a) To study the incidence and outcome of Rh negative pregnancy in relation to parity , antenatal visits and weeks of gestination.

(b) To find out the incidence of different blood group and Rh typing of parents and the new born baby.

(c) To develop some guidelines for the management of Rh immunized mother and the risk infants with a view to minimize the morbidity and mortality of the infants.

(d) To evaluate the associated complications of Rh negative pregnancy.

(e) To find out the success rate of Anti D immune prophylaxis both ante partum and postpartum not all patients.

**Materials and Methods**

The study dealt with 52 cases of pregnant patients with Rh negative blood group both primigravida and multigravida, immunized or nonimmunised, who presented in GOPD of CMH Chattogram during the period of July 2014 to Jul 2016

Informed written consent was taken from the patient. Data was collected by interviewing the cases per questionnaire from the history ,examination, investigation records. All the cases were observed from the date of admission till discharge. The study included the ABO grouping, Rh typing of the parents and their babies. Repeated screening of the Rh antibody in the mother as well as its titration and the management and outcome of the current pregnancy. History of previous blood transfusion, spontaneous or induced abortion, ectopic pregnancy, antepartum haemorrhage, abdominal trauma during pregnancy, any intrauterine procedure were taken in details.

The management of the patient depend on:

(a) The previous obstetrical performance i.e. any history of previous foetal loss due to Rh isoimmunisation or any history of affected baby requiring exchange transfution, history of developing kernicterous or any other obstetric complications like hydramnios, pregnancy induced hypertension.

(b) Presence of antibody, if any with titre.

(c) Rise of antibody titre during pregnancy.

The non-immunized Rh negative mother who gave birth to Rh positive babies were given postpartum anti-D immunoprophylaxis in a dose of 250-300 µgm within 24-72 hours of delivery.

Patients with high antibody titre and who gave birth to Rh negative baby were exempted from the prophylaxis. 02 cases of Rh negative non immunized mother were given antepartum anti-D immunoprophylaxis and followed up.

**Study Limitations:**

(a) For prediction of thev possibilities of Rh incompatible pregnancies, husband's genotype is necessary, but in this series husband's genotype was not possible as it is a retrospective study.

(b) For estimation of the foetomaternal bleeding detection of transplacental haemorrhage by Kleihauer-Betke test was not possible.

(c) Due to lack of fascilities for amniocentesis and intrauterine transfusion we had to depend on clinical evaluation of past history, antibody detection, early termination of pregnancy and exchange transfusion.

**Results**

The results of this study are shown in the following tables:

**Table-1.1**

*Incidence of Parity (n=52)*

| Gravida | Number of cases | Percentage |
|---|---|---|
| Primigravida | 15 | 28.8% |
| Multigravida | 37 | 61.5% |

There were 15 primi gravid patient and all of them were non immunized. Among 37 multigravid patients 5 were immunized in present pregnancies.

**Table-1.2**

*Incidence of Antenatal Checkup (n=52)*

| Antenatal check up | No. of cases | Percentage |
|---|---|---|
| Booked | 41 | 78.8% |
| Non booked | 11 | 21.1% |

Among the 52 patients 41 were booked cases and had regular antenatal check up. But 11 cases were non booked and among them 2 cases reported for the first time with labour pain and 01 case with post dated pregnancy.

**Table 1.3**

*Success Rate of pregnancy (n=52)*

| Gestational age (wks) | No. of cases | Percentage |
|---|---|---|
| 16-19 weeks | 1 | 1.9% |
| 29-32 | 1 | 1.9% |
| 33-36 | 5 | 9.6% |
| 37-40 | 35 | 67.3% |
| 41-42 | 10 | 19.2% |

Among the 52 cases, 01 multigravida patient aborted at 19 wks of gestation and 01 premature delivery occurred at 32 wks.

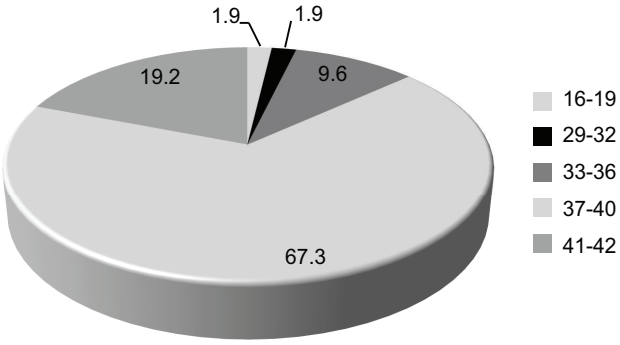


**Fig.-1 :**

**Table-1.4**
*Antibody Status of the Patients*

| Antibody Titure | No. of cases | Percentage |
|---|---|---|
| Titre detected | 5 | 9.6% |
| Titre not detected | 45 | 71.1% |
| Not available | 02 | 3.8% |

5 multigravida patients had raised antibody titre. Most of primigravida patient had no antibody. In two cases no documents of antibody were found.

**Table-1.5**
*Mode of Onset of Labour*

| Onset of labour | No. of cases | Percentage |
|---|---|---|
| Spontaneous | 24 | 46.1% |
| Induction | 6 | 11.5% |

Out of 6 induced labour, 02 were at 36 weeks due to high antibody titres, 01 was due to post dated pregnancy and 03 were due to severe pre-eclampsia.

**Table-1.6**
*Mode of Delivery*

| Mode of Delivery | | No. of cases | Percentage |
|---|---|---|---|
| Vaginal | Spontaneous | 28 | 53.8% |
| | Instrumental (Ventouse) | | |
| Caesarean | | 24 | 46.1% |

28 patients delivered vaginally. 02 needed instrumental delivery due to incomplete rotation of head.

**Table-1.7**
*Indication of Caesarean Section*

| Indication of caesarean section | Number of cases | Percentage |
|---|---|---|
| Unfavorable cervix | 5 | 9.6% |
| Failed induction | 4 | 7.6% |
| Cervical dystocia | 2 | 3.8% |
| Pre-eclampsia | 4 | 7.6% |
| IUGR | 1 | 1.9% |
| Oligohydramnios | 2 | 3.8% |
| Prematurity | 02 | 3.8% |
| Foetal distress | 02 | 3.8% |
| Cephalo pelvic disproportion | 02 | 3.8% |
| Breech presentation | 02 | 3.8% |
| Repeat section | 04 | 7.6% |
| Rhesus Isoimmunisation | 03 | 5.7% |

Only 03 cases needed caesarean section due to raised antibody titre.

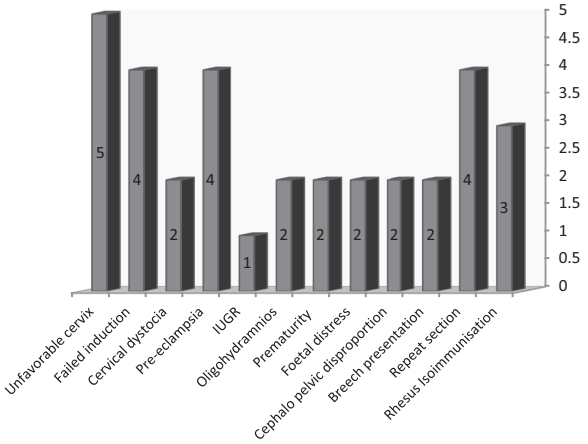


**Fig.-2:**

**Table-1.8**
*Incidence of Anti-D Immunoprophylaxis*

| Anti-d given | No. of cases | Percentage |
|---|---|---|
| Antepartum | 02 | 4.2% |
| Postpartum | 39 | 75% |

Among 52 case 02 unimmunized patients received antepartum Anti-D and 39 cases received post partum anti-D. 11 cases were not given anti-D because 5 cases were already immunized and 6 cases gave birth to Rh negative baby.

**Table-1.9**
*Incidence of Maternal Complication*

| Complications | No. of cases | Percentage |
|---|---|---|
| Pre-eclampsia | 7 | 13.4% |
| Anaemia | 2 | 3.8% |
| Hydramnios | 3 | 3.8% |
| PROM | 3 | 5.7% |

Among 7 cases of pre-eclampsis 02 were severe with IUGR babies rest 05 have mild pre-eclampsia 02 cases had hydramnios.13.4% patients had associated pre-eclampsia and 3.8% had hydramnios.

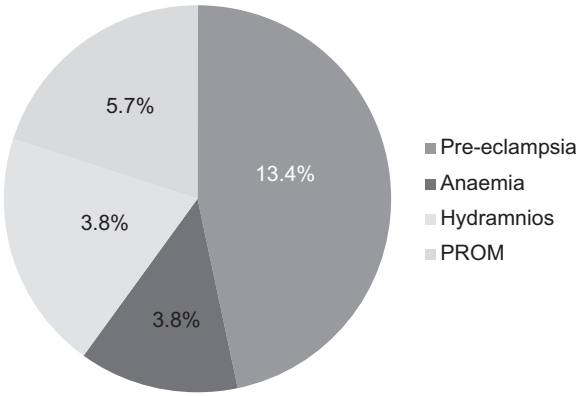


**Fig.-3:**

**Table-1.10**

*Previous Obstetric Outcome*

| Out come | No. of cases | Percentage |
|---|---|---|
| Spontaneous Vaginal delivery | 15 | 28.8% |
| Premature delivery | 4 | 7.6% |
| Abortion | 8 | 15.3% |
| Caesarean section | 8 | 15.3% |
| Still born | 4 | 7.6% |
| MR | 4 | 7.6% |
| Intrauterine death | 1 | 1.9% |
| Neonatal death | 5 | 9.6% |

Previous foetal losses were mostly due to rhesus immunization in multigravida patients.

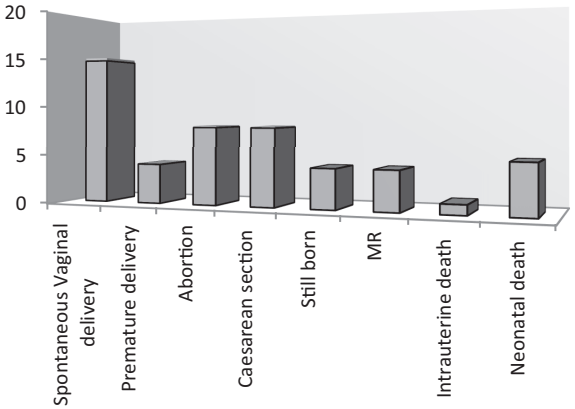


**Fig.-4:**

**Table-1.11**

*Foetal Outcome in Current Pregnancy*

| Out come | No. of cases | Percentage |
|---|---|---|
| Healthy on discharge | 47 | 90.3% |
| Abortion | 1 | 1.9% |
| IUGR | 3 | 5.7% |
| Prematurity | 4 | 7.6% |
| Still born | 1 | 1.9% |

Out of 37 multigravid patients 5 cases were immunized 01delivered a still birth foetus due to hydrops. 03 foetuses had features of Rh imcompatibility and needed exchange transfusion (3-4 times). This table show total foetal loss due to Rh immunization 01 out of 05 cases (20%).

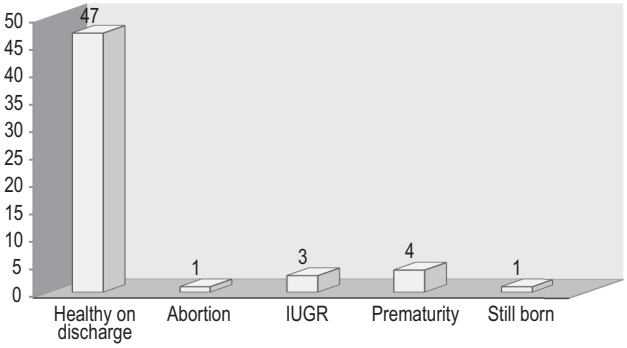


**Fig.-5:**

**Table-1.12**

*Analysis of the Blood Group of the Patients*

| Blood grouping and Rh typing | No. of cases | Percentage |
|---|---|---|
| O-ve | 20 | 38.4% |
| A-ve | 14 | 26.1% |
| B-ve | 12 | 23.07% |
| AB-ve | 6 | 11.5% |

Table XII shows the incidence of blood group and Rh typing of patients including in this study. 38.4% cases were O-ve.

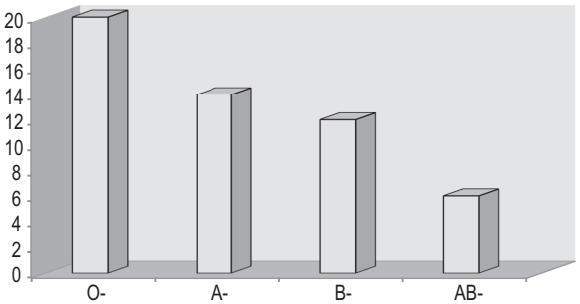


**Fig.-6:**

**Table-1.13**

*Blood Group of the Husband*

| Blood grouping and Rh typical | No. of cases | Percentage |
|---|---|---|
| B+ve | 15 | 28.8% |
| O+ve | 15 | 28.8% |
| A+ve | 14 | 26.09% |
| AB+ve | 08 | 15.03% |

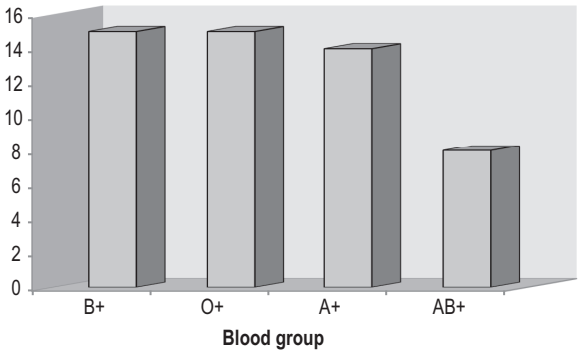


**Fig.-7:**

**Table-1.14**

*Blood Group of the Foetus*

(Detected from the cord blood sample)

| Blood grouping and Rh typical | Number of cases | Percentage |
|---|---|---|
| O+ve | 15 | 28.8% |
| A+ve | 12 | 23.07% |
| B+ve | 11 | 21.1% |
| AB+ve | 06 | 11.5% |
| O-ve | 01 | 1.9% |
| B-ve | 02 | 3.8% |
| A-ve | 02 | 3.8% |
| AB-ve | 01 | 1.9% |

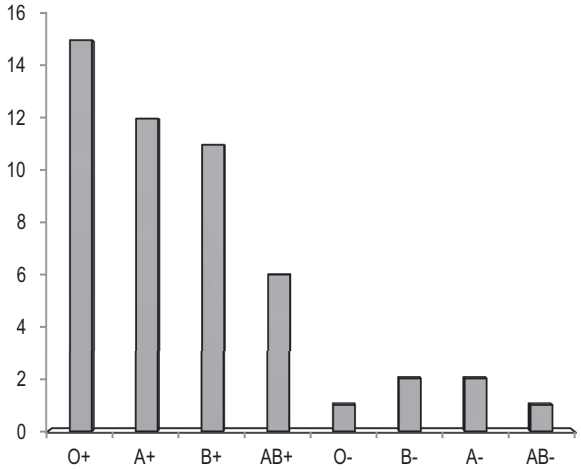


**Fig.-8:**

84.6% of the newborn foetuses were Rh positive and 11.5% fetuses were Rh negative. This was due to mating of the Rh negative women with heterozygous husband.

**Table-1.15**

*Antibody Titre During Current Pregnancy and Foetal Response*

| Antibody titre | No. of cases | Foetal response |
|---|---|---|
| 1:8 | 01 | Healthy baby slightly icteric on 3rd day. |
| 1:32 | 01 | Required exchange transfusion 03 times. |
| 1:64 | 01 | Required exchange transfusion 04 times. |
| 1:64 | 01 | Still born due to hydrops. |

Out of 52 cases 05 were detected as immunized cases. The titre of antibody detected its correlation to the foetal response and management shown in this table. Foetal prognosis was worse with rise of titre.

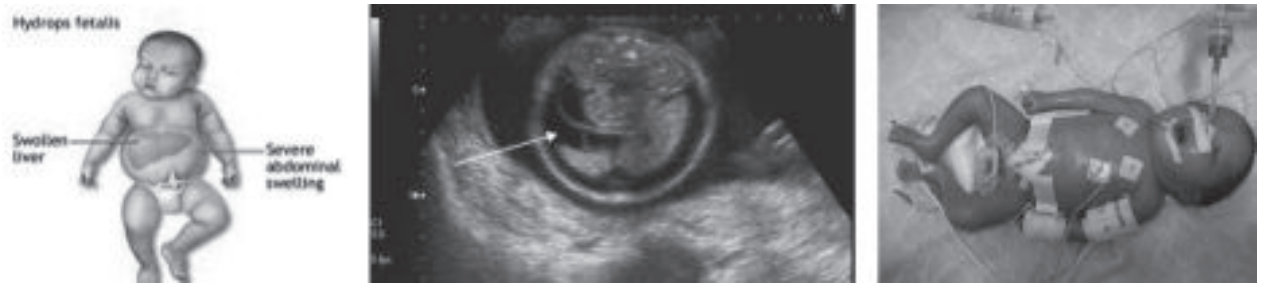


**Fig.-9:**

**Discussion**

Rh-immunisation in a Rh-negative woman conceiving a Rh-positive foetus is due to entry of Rh-positive red cells of foetus in to Rh-negative mothers circulation during delivery or abortion or intrauterine procedure. This usually manifests as clinical disease in foetus or new born in second and subsequent Rh positive concepetion. The primary Rh-immunisation in first pregnancy may develop long before delivery, as earliest as 8 wks of gestation[13]. With the better understanding of the disease, diagnosis and therapy have become highly sophisticated and a method for its prevention has been developed by immunoprophylaxis.

A study of 52 cases of pregnant patient with Rh-negative blood group was made to evaluate the problem of Rh immunisation in CMH, Chattagram. Treatment was individualized by Rh immunisation in maternal antibody titre. Previous obstetric history was analyzed with knowledge of gestational age. These clinical evaluating methods are quite effective in case of mild to moderately immunised pregnancy but were poor with highly immunised patients because of the presently available facilities for management. The management of non-immunised pregnancies were more or less same as normal pregnancy except that they were given immunoprophylaxis with Rh immunoglobulin after delivery.

The incidence of Rh negative pregnant woman was 1.8% in this series where as approximately 2.56% of the population are Rh negative. It was 4.6% in one study in 1991 at BSMMU and 4.8% in another study in 1986 at BSMMU. Incidence was 7.3% among referred patients in antenatal clinic in Chattagram (Hussain, 1990).

Out of 52 cases, 15 were primigravida, 37 were multigravida. Most of the patients were above the age of 20 years. Most of the patients recived antenatal care regularly and detection of Rh negative blood group in the first pregnancy was more because of more access to antenatal care.

Among 52 case, 01 multigravida patient aborted at 19 wks of gestation and 01 premature delivery occurred and baby died in prenatal period (not due to hydrops) 67.3% patients goes to term.

9.6% of subjects in this study were immunised whereas the study of Monnujan Begum (1991) showed 19%.

The frequency of transplacental haemorrhage during pregnancy increases with the period of gestation[1,7,14]. So we don't want Rh negative pregnancy to become postdated. In my series, 46.1% went into spontaneous labour and 11.5% were induced. Only one case induced for postdated pregnancy. 28 patients deliverd vaginally and some needed caesarean section. In 03 cases caesarean section were done for raised antibody titre.

Labour and foetal out come was not significantly different from other normal pregnant patients in cases of primigravid patients. The foetal out come in sensitized patients showed the over all foetal loss due to Rh isoimmunisation to be 20% whereas in Dr. Monnujan Begum's study it was 26.3%. This was significantly higher as compared to perinatal mortality in U.K. because of the lack of facilities for intrauterine foetal and advanced perinatal and neonatal management.

In present series out of 47 non immunized patients 02 received 100 µgm Anti-D at their 24 and 34 wks of gestation (4.2%). The incidence of Rh immunisation even postnatal administration of Anti-D (1.8%). It can be reduced to nil following antenatal prophylaxis.[4]

**Conclusion**

Although Rh isoimmunisation and erythroblastosis foetalis due to Rh in compatibility has now become a preventable disease, yet the problem of a Rh negative pregnant mother, not properly managed, is a real problem to the obstetrician. Many factors influence whether a mother will become sensitized or not. That includes timing, extent and number of episode of foeto maternal haemorrhage, the level of antibody production in the mother and the ABO state of the mother and foetus. An experienced Rh iso immunisation management team can reduce abortion, still birth, perinatal and neonatal deaths due to Rh incompatibility to a minimum level, and this can be achieved through a well

coordinated comprehensive Rh prophylaxis programme (antepartum and postpartum). Since the problem is now better understood and methods of prevention are available, combined efforts of obstetricians and of blood bank laboratory personnel are necessary to over come this preventable disease. The ultimate objective is to eliminate or reduce to an absolute minimum the cause of perinatal mortality due to haemolytic disease of the newborn by preventing Rh isoimmunisation.

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