Rhesus Negative Blood Incompatibility: Knowledge of Primiparous in a Community

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Abstract

Background: Incidence and the complication rate of Rh incompatibility varies in different parts of the world and the low incidence of Rh negativity often leads to the neglect of rhesus incompatibility in many parts of Asia.

Objectives: To assess the knowledge of primiparous and females with first child, regarding Rh incompatibility and its risk to mother and child and create awareness amongst them about the importance of blood grouping during pregnancy.

Study type, settings and duration: Cross sectional study, done in Korangi town Sector 33-B to 33-F of Union Council -7 of Karachi, consisting of 5000 randomly selected houses. About 350 primiparous and female with first child were selected by using systemic sampling plan.

Subjects and Methods: A structured questionnaire was used to assess the knowledge regarding Rh disease and hemolytic disease of newborn, after taking informed written consent. Testing for blood group was done at the site and report cards were issued to all participants. Information about Rh related aliments were also given to all participants to enhance their awareness about Rh disease.

Results: A total of 350 females were interviewed and checked for blood group and 8.3% were found to be Rh negative. Only 2% women had knowledge about complications related to negative blood group during and after pregnancy. Majority (94.3%) were not aware that what precautions should be taken if a mother's blood group is Rh negative.

Conclusions: Knowledge about blood groups, Rh incompatibility and its complications during pregnancy and after child birth was very low and needs to be addressed through public education.

Policy message: Blood grouping of married pair may be helpful in early diagnosis of Rh –ve blood incompatibility.

Key words: Primiparous, rhesus, blood incompatibility.

Introduction

Despite the introduction of Rhesus (Rh) immunoglobulin in 1968, hemolytic disease of newborn remains a serious concern. It was reported that immunoglobulin prophylaxis does not eradicate hemolytic disease of the fetus in the newborn and it is estimated that there is an incidence of 10.6 cases per 10,000 deliveries of hemolytic disease of newborn world wide with geographic variations.

When an RhD negative mother is exposed to the RhD positive red cells (usually as transplacental haemorrhage), she develops allo-anti-D which cross the placenta and results in the destruction of fetal red cells. Clinical manifestations of RhD hemolytic disease range from asymptomatic mild anaemia to hydrops fetalis or stillbirth associated with severe anemia and jaundice.

Hemolytic disease of newborn was a significant cause of fetal mortality and morbidity until the introduction of amniocentesis, intrauterine transfusion, and exchange transfusion in the management of severely alloimmunised women and their fetuses.

Rh iso-immunization still contributes to the neonatal morbidity and mortality in the world due to non-immunization, under-immunization, and false Rh typing in rare cases. When maternal sensitization to the D antigen is present, it is important to establish the paternal zygosity. In the white population, the incidence of heterozygosity for the D antigen is 56%. In such cases of paternal heterozygosity, only 50% of the fetuses will be potentially at risk for isoimmunization. Therefore, by establishing the paternal zygosity, improved counseling of couples concerning risks and treatment options can be provided. Furthermore, if paternal homozygosity is confirmed, the need for invasive procedures to diagnose fetal blood type may be obviated. Fetomaternal hemorrhage exposes the mother to foreign red cell antigens, which can lead to an immune response in the mother. Prior maternal transfusion can also lead to development of subsequent hemolytic disease of newborn. Although more than 60 antigens can cause hemolytic disease of newborn, the most common cause is Rh sensitization. Hemolytic disease of the
newborn can also be caused by less common atypical antibodies, which can cross the placenta and affect the fetus in a similar fashion. Severe fetal disease due to these atypical antibodies is rare. A combined incidence of severe fetal disease of 0.1% to 2% has been reported earlier. The purpose of this study was to assess knowledge of primiparous and female who delivered first child regarding Rh negative incompatibility and their risk to mother and child.

**Subjects and Methods**

This cross sectional study was done in Korangi town Sector 33B to 33F of Union Council (UC)-7 (randomly selected) of Karachi. In UC-7, there are 5000 houses and total population is about 66,000. First house hold was selected by simple random digit number and then systemic sampling plan was applied in which every 14th house was taken. About 350 primiparous and female with first child were selected by using systemic sampling plan. After taking written informed consent, a structured questionnaire was used to assess their knowledge regarding Rh disease and its complications. Questionnaire included information on maternal and child health, complications of Rh incompatibility during and after pregnancy, its risk to new born, prevention of Rh disease, consultation of health care providers during pregnancy and number of visits to health care centre during pregnancy etc. Multigravida or those who refused to participate were not included. Blood grouping test was performed on the spot using rapid slide technique. Subjects who were tested as Rh Positive were given a report card on the same day while negative blood groups were taken to laboratory and confirmed by reverse blood grouping and report cards were issued to them on the next day.

During household visit, verbal sessions were done with the families to enhance their awareness about Rh disease and its complications during and after pregnancy. Information related to Rh disease in those who were found Rh negative was disseminated through trained lady health visitors. The male member of research team interacted with the male family members of participating community for further clarification.

**Results**

A total of 350 primiparous and females with first child were interviewed and checked for blood group. Almost 11% females were below 20 years of age, 75% were between 20-30 years of age and 14% were 30 years and above. About 72% females were Urdu speaking, 12.3% Punjabi, 7.1% Sindhi and 8.3% were of others ethnic groups. Literacy rate showed that 18.3% were illiterate, 18% were primary educated, 44.3% were matriculate, 14% were intermediate, 5.3% were graduates and only 01 was post-graduate.

A total of 29 females (8.3%) were Rh negative. Blood grouping showed that blood group “B” was commonest among both Rh Negative and Rh Positive participants (Table-1).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood group of married females</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>111(31.7%)</td>
<td>10(2.9%)</td>
</tr>
<tr>
<td>O</td>
<td>102(29.1%)</td>
<td>8(2.3%)</td>
</tr>
<tr>
<td>A</td>
<td>74(21.1%)</td>
<td>7(2.0%)</td>
</tr>
<tr>
<td>AB</td>
<td>34(9.7%)</td>
<td>4(1.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>321(91.7)</td>
<td>29(8.3%)</td>
</tr>
</tbody>
</table>

Knowledge about Rh negative incompatibility and its complication is shown in Table-2. Majority of the participants did not know their own blood group (81%) or their husband’s blood group (96%) though, 50% were married to their first cousins. Information about complications following Rh incompatibility was also not known in almost all cases (99%).

<table>
<thead>
<tr>
<th>Variables</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t know about consequences of blood incompatibility on fetus/newborn</td>
<td>99%</td>
</tr>
<tr>
<td>Married to first degree relative</td>
<td>51%</td>
</tr>
<tr>
<td>Knew about complication related to negative blood group during and after pregnancy</td>
<td>2%</td>
</tr>
<tr>
<td>Don’t know what precautions should be taken if a mother’s blood group is Rh negative</td>
<td>94.3%</td>
</tr>
</tbody>
</table>

Almost 87% females were registered or had been registered with the health care facility but 51% rarely visited health care facility for antenatal checkup, and 48% regularly visited the facility during and after pregnancy. Delivery at home was conducted in 13% cases.

A trained lady health visitors disseminated the information to the families about potential harms of being Rh negative pregnant mother and their newborn.

**Discussion**

In the present study Rh incompatibility was seen in 8% women who were either primiparous or had delivered a child in the past. Knowledge about blood groups and Rh incompatibility and its complications during pregnancy and after child birth was very low.

In Pakistan, maternal mortality rate is 500 per 100,000 births resulting in the death of nearly 25,000 women each year due to pregnancy related complications. According to WHO, the incidence and complications due to Rh incompatibility vary in different parts of the world and the low incidence of Rh negativity often leads to the neglect of rhesus incompatibility in many parts of Asia. The reproductive risk of Rh negative
woman in Africa, Asia or China is three times that of European women. It is cheap and easy to detect Rh negativity during pregnancy.

Current study showed that only 13% deliveries were conducted at home and this figure is far better than earlier reports. However, around 52% females rarely visited health care (1-2 times during pregnancy) centre during pregnancy and 99% were unaware about the consequences of Rh negative incompatibility in the newborn. These parameters give us information that a large proportion of newborns are at risk of hemolytic disease of the newborn.

Many procedures are available to intervene hemolytic disease of the newborn related ailments but unfortunately they cannot be applied to our population due to high cost and accessibility issues. To prevent hemolytic disease of the newborn, sufficient knowledge on blood group and Rh typing prior to delivery can help to reduce the burden. Awareness about RH related issues and its complications due to negative blood group was very poor in the present study and 19% females had knowledge about their blood group and only 4% female knew their husband’s blood group.

In Pakistan infant mortality rate is 84/1000 births with an under-five mortality rate of 112/1000 births. Much of this high infant mortality is related to problems in early infancy and maternal health including high rates of fertility and large family size. Rh incompatibility usually happen in the second and subsequent pregnancies, so the risk of having Rh incompatibility also increases with the bigger family size. A study from Lahore reported hemolytic disease of newborn in 20.5%, ABO incompatibility in 58% and Rh incompatibility in 19% cases. Another study also reported that blood incompatibility was the main cause of jaundice in 7.7% neonates with 5% having ABO and 2.7% Rhesus incompatibility.

In the present study the Rh negativity was 8.3% and blood group B was commonest in both Rh negative and positive group and similar were the findings in the study conducted in Lahore. A retrospective study from Bahawalpur Division showed the commonest blood group being ‘O’ and incidence of Rh negativity was 4.5% while another study on female blood donors from Punjab showed that blood group A was the commonest.

This study shows that knowledge regarding blood group, Rh negative incompatibility and its complications during pregnancy and after child birth were very poor. Mass media campaigns and awareness drives need to be done in the public and in the reproductive age women and pregnant cases to make them aware of the importance of blood grouping and its complications in Rh negative mothers.

Acknowledgement

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References