NON IMMUNE HYDROPS FETALIS
INCIDENCE AND CAUSES

Simi Fayyaz and Shamim S Majid

Department of Gynaecology and Obstetrics,
Postgraduate Medical Institute,
Lady Reading Hospital, Peshawar.

SUMMARY

This one year study was done in Lady Reading Hospital to see the incidence and causative factors of non immune hydrops fetalis. The advent of anti Rh has led to marked reduction in immune hydrops fetalis. During this time period total 6 cases out of 5149 admission were detected for which a protocol was made. During this study deficiencies of the facilities were noticed due to which cause could not be established in 2 out of 6 cases. Due to expected poor fetal out come there was lack of interest on behalf of the parents. All the babies were delivered preterm with 100% perinatal mortality. Overall this project provided the unit a protocol for these cases as the management of non-immunological hydrops completely differs from immunological hydrops.

INTRODUCTION

Hydrops fetalis is a potentially lethal condition caused by immunological and non immunological factors. It is not a disease but signifies presence of an underlying problem, rather it is manifestation of several pathologies. Hydrops fetalis has been recognized over a 100 years however non immune hydrops fetalis was first described by Potter's who differentiated between immune and non immune Hydrops where there was no evidence of antibodies in latter case. It is also important to differentiate among these two conditions as prognosis for both entities is markedly different. Many definitions are provided by the workers for describing non immune hydrops fetalis. Mainly it is the presence of excessive extracellular fluid in two or more sites without any identifiable circulating antibodies to red cell antigen, and or edema of soft tissues. Mchoney et al in 1984 said, “Generalized skin thicken of 5 mm or more with two or more among placental thicken pericardial or placental effusion and ascites." Non immune hydrops fetalis is rare but important condition which accounts for 3% of overall perinatal mortality. It complicates one pregnancy among 3000 - 5000 cases.
MATERIAL AND METHODS

This study was conducted in Gynae B unit of PGMI/LRH for one year, lasting from first June 1995 to 31st May 1996. Patients presenting with hydrops fetalis and a positive blood group were investigated according to a standard protocol and counselling. Total 6 cases, out 5149 deliveries were identified and labelled as non immune hydrops fetalis. As all the facilities for prenatal diagnosis were not available in the hospital, some of the investigations were sent to Armed Forces Institute of Pathology. Antenatally fetal echocardiography was performed to rule out any cardiac cause. The cooperation of departments of Pathology, Cardiology and Radiology was invaluable in investigating these cases. Some of the patients refused complete investigations as the fetal outcome was not promising. Therefore exact cause could not be found in two cases. More over facility for fetal blood sampling was not available so fetal blood was taken postnatally to complete the investigations. Postmortem and X-rays of the babies was done in all cases. The incidence was higher than normally quoted with a 100% perinatal mortality. Postnatally these patients were given a counselling session which included cause of the hydrops fetalis, chances of recurrence in next pregnancy and need of early booking and screening in next pregnancy.

RESULTS

The percentage of uncertain and idiopathic causes can be decreased with availability of facilities for pre-natal diagnosis and proper counselling and patient’s compliance.

The incidence was 1.16 per thousand which is more than reported world wide reflecting the importance of this condition complicating pregnancy. Moreover being the largest hospital of the province Lady Reading gets referrals of the complicated cases showing a need of fetal therapy unit, so that proper management of these cases can be done. The period of gestation at which these cases presented was between 28 and 37 weeks. All of them delivered before term due to spontaneous preterm labour or induction, which was again a contributing factor in perinatal mortality which was 100%. (Table-1)

All cases were identified as non immune hydrops fetalis when there was clinical and sonographic evidence of hydrops fetalis and negative antibodies to red cells. All the patients had set of investigations according to protocol but two of them fail to complete them due to lack of interest and limited resources. (Table-2)

<table>
<thead>
<tr>
<th>Complications of pregnancy</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-eclampsia</td>
<td>1</td>
</tr>
<tr>
<td>Polyhydramnios</td>
<td>4</td>
</tr>
<tr>
<td>Primary postpartum haemorrhage</td>
<td>3</td>
</tr>
<tr>
<td>Shoulder dystocia</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period of Gestation</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 28 weeks</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Between 28-37 weeks</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>More than 37 weeks</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

TABLE - 2

TABLE - 3

TABLE - 4
NOM IMMUNE HYDROPS FETALIS INCIDENCE AND CAUSES

<table>
<thead>
<tr>
<th>Mode of delivery</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal vaginal</td>
<td>4</td>
</tr>
<tr>
<td>Assisted breech</td>
<td>2</td>
</tr>
</tbody>
</table>

**TABLE 5**

Polyhydraminous was the complication of pregnancy in 5 cases while one of them presented with pre-eclampsia. Spontaneous preterm labour started in 4 out of 6 cases while induction was done in two cases. (Table 3)

Two patients had breech delivery while 4 delivered cephalic. Shoulder dystocia complicated the delivery in one case while postpartum hemorrhage occurred in 3 cases which required blood transfusions. (Tables 4, 5)

Causes of Non immune hydrops fetalis was Down syndrome in one case, diaphragmatic hernia in one case, active toxoplasmosis infection one case and idiopathic in one case as cause could not found inspite of compete investigations while the cause remain uncertain in two cases as investigations could not be completed due to causes mentioned earlier. (Table 6)

**DISCUSSION**

The percentage of Non Immune Hydrops Fetalis is increasing due to high resolution scan and decreasing number of Rh Iso immunization due to prophylaxis with anti-D.7-10 The estimated ratio of immune to non immune is 1: 9.11 A variety of conditions are associated with Non Immune Hydrops Fetalis. Therefore the outcome would be variable depending upon the cause. In a series of studies perinatal mortality was 50 - 98%.12,13 Sometimes hydrops resolves itself but mostly prognosis in grave for the fetus14 especially if there is associated structural abnormality. Common causes of NIHF are idiopathic, fetal cardiac anomalies, structural anomalies, infections, anaemia or chromosomal anomalies. Sometimes there is obvious link between the anomaly an hydrops while in others the link is unclear. Twenty years back cause could be found in 60% of cases while now it can be established in 80 - 85% of cases. Therefore number of cases labelled as idiopathic are decreasing.

Non Immune Hydrops Fetalis is the end result of a group of disorders of fetus, umbilical cord and placental which causes deranged fluid homeostasis.6,15 There are three possible mechanism responsible for hydrops which can act alone or in combination. These informations were collected by postmortem initially but later on by amniocentesis and cordocentesis. Cardiac failure is the commonest mechanism16 which causes increase venous pressure which reduces lymph flow which is a major con-tributor to hydropic changes due to cardiac failure.17 Anaemia is another cause of hydrops which causes high output Cardiac failure. There is elevated umbilical venous pressure secondary to portal hypertension. Anaemia also causes hypoxia and acidosis resulting in cellular damage due to which there is extravasation of fluid to extracellular space. Hyproproteinemia is another cause held responsible for hydrops but it is not clear weather it is result or the cause of hydrops.

Diagnosis of hydrops in mainly ultrasound based. High resolution scans provides earlier detection and is single most impor-
tant noninvasive modality. Amniocentesis, cordocentesis and fetoscopy are recent advances in field of prenatal diagnosis but are invasive and carries certain risk of fetal loss up to 1-2%. To find out the cause a detail history, investigations to exclude fetomaternal hemorrhage, infections, auto antibodies and diabetes should be done. Similarly for fetus echocardiography, doppler studies and detail anomalies can be done. Moreover fetal blood should be analysed for infections, blood group and Rh factor, combs test, blood gases and karyotyping. Postnatally a detail examination of the body with skeletal survey should be done and in case of still birth postmortem is must. All these cases needs a multidisciplinary management. After evaluation they should be counselled properly. Induction, termination or fetal therapy and outcome should be discussed. A tertiary level nursery is required for these babies. Involument of expert paediatrician is worth while options about antenatal therapy can be discussed as some of the cases can be treated by drug therapy to mother or direct to fetus transplacentally or through cordocentesis. In some cases aspiration of effusions and ascites by ultrasound guidance can be offered. Mode of delivery should be discussed as due to big size and compromised baby rate of operative deliveries and complications are high.

**CONCLUSION**

It is time to provide facility of prenatal diagnosis in the tertiary level hospital at least to a limited number of cases as the parents wants to know the exact cause of fetal anomaly or loss and the recurrence of the condition. Without having facilities in hand these questions can not be answered. Therefore fetal medicine unit needs to be started so that we can get trained and experienced staff in future to meet the new challenge

**REFERENCES**


