Generalized skin thickening of more than 5mm and / or two or more of the following • Pericardial Effusion • Pleural Effusion • Ascites • Placental Enlargement
Presence of excess extra-cellular fluid in two or more sites without any identifiable circulating antibody to red cell antigens
Generalized skin thickening of more than 5mm and / or two or more of the following

- Pericardial effusion
- Pleural Effusion
- Ascites
- Placental Enlargement
Pericardial Effusion
Body wall edema in a hydropic fetus
Fetal Ascites
Non-immune Hydrops Fetalis

Asim Iqbal
Dept. Obstetrics & Gynecology
Nishtar Hospital, Multan, Pakistan.

Fetal Ascites
Hydrocele can be an early manifestation in hydrops
Non-immune Hydrops Fetalis

Asim Iqbal

Dept. Obstetrics & Gynecology
Nishtar Hospital, Multan, Pakistan.

Placenta of Hydropic Pregnancy
Placenta of Normal Pregnancy
Soft Tissue shadow and pleural effusion in hydropic neonate
Incidence
5 - 8 per 10,000
This data represents the figure of live born hydropic neonates admitted in neonatology units. Actual incidence is much higher, since majority die either in-utero or the pregnancies are terminated electively.
Pathogenesis

- It is an end result of an array of disorders of the fetus, umbilical cord and placenta that leads to deranged fluid homeostasis.
- A wide range of fetal organs are involved - No common mechanism is responsible for the signs of hydrops.
Pathogenesis
Three main hypotheses:
- Anemia
- Cardiac Failure
- Reduction in Osmotic Pressure (Hypoproteinaemia)
Pathogenesis

Fetal Anemia:
- High output cardiac failure
- Increase in umbilical venous pressure
- Portal hypertension in severely effected fetuses due to increase in hepatic erythropoetic tissue
- Hypoxia and acidosis predispose to epithelial damage in capillaries that...
Pathogenesis

Fetal Anemia:
- Alpha (α) Thalasaemia
- Secondary to Feto-maternal Hemorrhage
- Twin-twin transfusion
- Other Hemoglobinopathies
Pathogenesis
Cardiac Failure:
• Commonest Mechanism
• Increase in Cardiac Size
• Increased Fetal Venous Pressure
Pathogenesis
Cardiac Failure:
Disorders of cardiac function / Structure include
• Cardiomyopathies
• Tachyarythmias
• Bradycardias (congenital heart block)
• Obstructive left heart disease
• Ebstien's anomaly
• Atrial isomerism
Pathogenesis
Reduced Osmotic pressure:
- Hypoproteinaemia with Subsequent Reduction in Osmotic Pressure
  - Anemia Along With Destruction of Hepatic Architecture
  - Congenital Nephrosis
Hypoproteinaemia may be the result of loss of proteins from circulation, rather than the cause.
Pathogenesis

Other:
- Obstruction to venous return
  - Congenital cystic adenomatoid malformation of lung
- Impaired lymphatic drainage
  - Cystic hygroma
  - Karyotypic abnormalities (45XO)
Non-immune Hydrops Fetalis

Pathogenesis
Fetal Infections:
• TORCH
• Parvo Virus B19
Non-immune Hydrops Fetalis

Associated Maternal Complications:

- Polyhydramnios
- Pre-mature labour
- Oligohydramnios
- Problems with third stage

In an attempt to compensate for the fetal hypoxia, placenta increases in size and sometimes also penetrate deeper into the myometrium. Thus causes the morbid adherence of placenta and can cause the problems for third stage of labor necessitating the manual removal of Placenta.
Non-immune Hydrops Fetalis

Presence of excess extra-cellular fluid in two or more sites without any identifiable circulating antibody to red cell antigens

**Investigations:**
- Detailed Ultrasound Scan
- Fetal Echocardiography
- Doppler Blood Flow Studies
- Liquor Volume Assessment (AFI)
- Placental Thickness & Echogenicity
Non-immune Hydrops Fetalis

Presence of excess extra-cellular fluid in two or more sites without any identifiable circulating antibody to red cell antigens

**Fetal Blood Sampling:**
- Full Blood Counts
- Karyotype
- Blood Gas Analysis
- Virology screening
- Bio-chemical Evaluation
- Umbilical Venous Pressure
**Fetal Blood Sampling:**
Blood can be obtained from various sites
- Placental insertion of umbilical cord
- Fetal insertion of umbilical cord
- Intra-hepatic vein
- Heart

Procedure related fetal loss is 25% in hydropic fetus
Non-immune Hydrops Fetalis

Generalized skin thickening of more than 5mm and / or two or more of the following

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Management:

- Multi-disciplinary
- Option of Termination of pregnancy
- Postmortem examination, Photographs & X-rays
- Therapy should only be commenced in the light of a firm diagnosis
- Ideal to wait until fetal karyotype is available
Management:
Prenatal Therapy
• Transplacental drug therapy
• Direct fetal drug therapy
• Invasive procedures
Transplacental drug therapy

Drugs are given to the mother and are passed to the fetus through the placenta

- The main conditions which respond to this approach are fetal dysrrhythmias (SVT)
- Once the type of dysrrhythmia is identified, antiarrhythmic agent is given to the mother, with careful monitoring of her ECG & blood levels.

**Drugs:** Digoxin, Verapamil, Amiodarone, Flecanide.

Careful Maternal & Fetal Monitoring is Essential
Direct fetal drug therapy
Maternal administration of drugs may be ineffective due to:
• Maternal Metabolism
• Maternal Side Effects
• Variable Passage Across Placenta

Routes for direct fetal drug therapy:
• Intraperitoneal
• Intramuscular
• Intravascular
Non-immune Hydrops Fetalis

Generalized skin thickening of more than 5mm and / or two or more of the following
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Invasive Procedures
Blood / Albumen Transfusion to Fetus
- Intraperitoneal
- Intravenous
- Umbilical Vein
- Hepatic Vein
**Invasive Procedures**

Drainage Procedures:
- Large Pleural Effusions
- Ascites

All invasive procedures carry an inherent increased risk of fetal demise or pre-mature labor.
Non-immune Hydrops Fetalis

- Rarely straightforward
- Temptation to deliver the sick fetus before term should be avoided
- Common maternal complications should also be considered like associated polyhydramnios.
- Amniocentesis before delivery makes the delivery easy and less traumatic for both mother & Fetus, and facilitates resuscitation

Generalized skin thickening of more than 5mm and/or two or more of the following:

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Obstetric Management

- Most of the times such fetuses are delivered with elective cesarean section.
- No evidence that mode of delivery has a marked effect on outcome.
- Pediatric team should be aware about the nature of fetal problem before delivery as resuscitation is often difficult and adequate senior assistance must be available.
- High incidence of third stage complications should not be overlooked.
Prognosis?
Generally very poor with very high peri-natal mortality
A hydropic neonate under extensive intensive care
Treatment - Conclusion

- Successful therapy can be administered in some cases, yet majority are associated with a poor prognosis.
- Appropriate prenatal investigations must be performed to make a correct diagnosis to identify an affected fetus in whom a good outcome may be anticipated.
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Basky Director, Fetal Medicine Unit
St.Geroge's Hospital Medical School
Cranmer Terrace
London SW17 0QT
http://www.fetalmedicine.ac.uk/fmu.shtml

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www.thefetus.net

I am extremely grateful to them for granting me the permission to include some of the ultrasound images from their web sites.

Source URL: http://www.diagnosticimaging.com/printpdf/non-immune-hydrops-fetalis/page/0/16

Links: