Experimental
&
Clinical Article

Analysis of Non-Immune Hyrops Fetalis: Evaluation of 15 Cases

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OBJECTIVES: To evaluation the ultrasound characteristics, etiological factors and perinatal outcome in hydrops fetalis.

STUDY DESIGN: A total of 15 hydrops fetalis presented in our perinatology unit, were studied prospectively.

RESULTS: The etiology of non-immune hyrops fetalis (NIHF) consisted, 7% (1/15) of thoracic-lung disease, 7% (1/15) of chromosomal abnormality. In 86% of the cases no definitive etiological factor was determined. Outcomes of 15 NIHF pregnancies were termination of pregnancy in 4 cases, intrauterine and neonatal exitus in 1 and 9 case respectively and 1 healthy baby. The perinatal mortality rate of the present study group was 67%.

CONCLUSIONS: Non-immune hydrops of newborn infant is associated with a high mortality rate and requires complex diagnostic and therapeutic procedures. Detailed ultrasound examination, fetal karyotyping, investigations for fetal infections and genetic diseases should be performed for all NIHF cases with a multidisciplinary approach.

Key Words: Non-immune hyrops fetalis, Perinatal mortality

Gynecol Obstet Rebrod Med 2012;18:131-133

Inroduction

Hydrops fetalis is a condition in the fetus characterized by an accumulation of fluid, or edema, in at least two fetal compartments, including the subcutaneous tissue, pleura, pericardium, or in the abdomen. Decreased fetal movements, polyhydramnios, and maternal pre-eclampsia may lead us to suspect hydrops. Detection of a placental thickness of 5 mm or more may be a clue as well, especially if a "ground glass" appearance is observed.[1] There are many causes of NIHF, but the etiology is most commonly idiopathic (50%) and extremely complex.[2,3] The cause of non-immune hydrops fetalis may be secondary to maternal and placental disorders but, generally it is associated with fetal disorders. The common etiological factors of non-immune hydrops fetalis are cardiovascular abnormalities, infectious disease and aneuploidy in Europe.[4] The prognosis is associated with the etiology and hydrops subtype. The mortality rate remains high and varies as % 50-98.[5]

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Submitted for Publication: *19. 07. 2012*
Accepted for Publication: *19. 12. 2012*

Material and Method

From January 2011 to June 2012, 15 hydrops fetalis presented in our perinatology unit, were studied prospectively. Patients with immune hydrops fetalis (Rhesus (Rh)-negative mothers and Rh-positive fathers) were excluded. A detailed ultrasound examination was performed (Voluson 730 PRO 4-D ultrasound device), including the observation of the presence of generalized skin thickening >5 mm and at least two of the following features: ascites, pleural effusion, pericardial effusion, or placental enlargement. Fetal karyotype, maternal infectious causes and viral screening (toxoplasmosis, cytomegalovirus, herpes and parvovirus B19) were offered to every case. Maternal hyperthyroidism, treponemal screening and rubella immunity were checked from maternal records. Parents made the decision of pregnancy termination after an appropriate counselling. Postmortem examination was recommended in cases undergoing pregnancy termination. The mean and standard deviation (SD) were calculated for continuous variables. Statistical analyses were performed using the SPSS software (ver. 15.0 for Windows; SPSS, USA).

Results

The demographic and clinical characteristics of the cases are shown in table 1. The NIHF groups had a median gestational age of 24.26 ± 6.80. Mean maternal age was 28 ± 6.45 years. The etiology of non-immune consisted 7% (1/15) of thoracic-lung disease (cystic adenomatoid malformation), 7%

(1/15) of chromosomal abnormality (tetraploidy). In 86% of the cases no etiological factor was determined. The perinatal mortality rate of the present study group was 67%. Outcomes of 15 NIHF pregnancies were termination of pregnancy in 4 cases, intrauterine and neonatal exitus in 1 and 9 cases respectively and 1 healthy baby.

Table 1: The clinical characteristics and outcome of cases with non-immune hyrops fetalis (NIHF).

Age (years)	28±6.45	(20-40)
Parity (%)	1±1.54	(0-5)
GA at admission (weeks)	24±6.80	(13-36)
GA at delivery (weeks)	30±5.68	(18-37)
Neonatal weight	2285±1269.13	(250-3910)
Chromosomal finding	Tetraploidy	
Additional fetal anomaly	CAM	
Prognosis (%)		
Termination	26	
Death	67	
Alive	7	

GA: Gestational age CAM: cystic adenomatoid malformation

Discussion

The etiology of NIHF includes vascular (20%), chromosomal (16%), hematological (10%), and placental (8%) causes, as well as an idiopathic cause. Maternal causes are rare and are mostly infection or diabetes mellitus (DM).[6,7] When our cases were evaluated, a tetraploid chromosomal disease and a cystic adenomatoid malformation (CAM) was identified as the cause of NIHF. Other chromosomal results were negative in 5 cases. In the published studies, the most common findings among the many factors under 24 weeks of gestation were chromosomal disorders. In the present study, in the 10 of 15 cases were upper of 24 weeks of gestation. However, we couldn't analyse fetal karyotyping in all cases, therefore the diagnosis of chromosomal disease was found only in one case. In one case CAM was diagnosed prenatally. However, the additional processing to investigate the cause of NIHF could not be able to do because of the fetal death in the postpartum period despite to the intensive resuscitation. Maternal anemia was detected in 36 week's of gestation in one of 15 fetuses who survived only till birth and also in the postpartum period. In this case, the mother's hemoglobin electrophoresis, TORCH infection parameters and the fetal hemoglobin were found to be normal. Baby is still alive and healthy. In 13 of 15 cases, the precise cause of NIH could not be ascertained because of the family had not requested an autopsy.

NIHF is the end result of one or more abnormalities:[8-10] obstructed lymphatic drainage in the thoracic and abdominal cavities (eg, congenital anomaly, neoplasm); increased capillary permeability (eg, infection); increased venous pressure due to myocardial failure or obstructed venous return to the heart; or reduction in osmotic pressure (eg, liver disease, nephropathy, non-immune mediated anemia). The most common chromosomal cause of NIHF is monosomy X, which accounts for 42 to 67 percent of cases.[11] Other aneuploidies associated with hydrops are Trisomy 21 (23 to 30 percent of cases), other forms of aneuploidy including Trisomy 13,18, and 12 (10 percent of cases), tetraploidy and triploidy, and rare deletions and duplications.[11] Thoracic abnormalities account for up to 10 percent of hydrops. These lesions including CAM increase intrathoracic pressure and can obstruct venous return to the heart, leading to peripheral venous congestion, or they may obstruct the lymphatic duct, resulting in lymphedema. Interference with fluid exchange between the lung and amniotic cavity may also contribute to polyhydramnios.[12] Management options include termination of the pregnancy, therapeutic intervention when possible, and supportive care/monitoring of the mother and fetus in continuing pregnancies.[12,13]

In conclusion, non-immune hydrops fetalis is associated with a high mortality rate and requires complex diagnostic and therapeutic procedures. Detailed ultrasound examination, fetal karyotyping, investigations for fetal infections and genetic diseases should be performed for all NIHF cases with a multidisciplinary approach.

Non - İmmün Hidrops Fetalis Analizi: 15 Olgunun Değerlendirilmesi

AMAÇ: Hidrops fetalis olan olgularda ultrasonografik karakteristik özellikleri, etyolojik faktörleri ve perinatal sonuçları değerlendirmek

GEREÇ VE YÖNTEM: Toplam 15 hidrops fetalis olgusu perinatoloji ünitesinde prospektif olarak değerlendirildi.

BULGULAR: Non-immün hidrops fetalis etyolojisinde %7 (1/15) torasik-akciğer hastalık, %7 (1/15) kromozomal hastalık tespit edildi. Vakaların % 86'ısında kesin etyolojik faktör belirlenemedi. Toplam 15 NIHF sonuçlarına bakıldığında 4 gebelik temrine, 1 intrauterin eksitus, 9 neonatal eksitus ve 1 sağlıklı bebek elde edildi. Bu çalışmada perinatal mortalite oranı %67 olarak bulundu.

SONUÇ: Yenidoğan non-immün hidropsu yüksek mortalite oranı ile bağlantılı olup, kompleks tanı ve terapötik prosedürler gerektirir. Detaylı ultrasonografik inceleme, fetal karyotipleme, fetal infeksiyonlar ve genetik hastalıklar tüm NIHF olgularında mültidisipliner bir yaklaşımla araştırılmalıdır.

Anahtar Kelimeler: Non-immün hidrops fetalis, Perinatal mortalite

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