Title

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CONCLUSION: Teleultrasound is inferior to on-site ultrasound in the detection of fetal anomalies. However, clinically, a negative teleultrasound is more likely to identify a non-anomalous fetus and a positive teleultrasound is more likely to correctly identify an anomalous fetus. Therefore, teleultrasound has an important role in prenatal diagnosis for those patients unable or unwilling to travel for an on-site ultrasound.

437 Underlying etiologies in prenatally-diagnosed non-immune hydrops fetalis

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OBJECTIVE: Since the introduction of Rh(D) immune globulin, non-immune hydrops fetalis (NIHF) now constitutes the majority of hydrops cases. A myriad of genetic, structural, and other abnormalities have been associated with NIHF, yet after prenatal standard work up, the etiology often remains unclear. Our objective was to examine the clinical characteristics and etiologies in a diverse cohort of prenatally-diagnosed NIHF cases.

STUDY DESIGN: This was a retrospective cohort study of NIHF cases evaluated between January 2015 and January 2017 at three University of California Fetal-Maternal Consortium (UCfC) sites: UC Los Angeles, UC San Diego, and UC San Francisco. Exclusion criteria were multiple gestations and Rh isoimmunization. Each NIHF case was managed according to standard practice at each site and society recommendations. Clinical data were extracted for each case, including demographic information, obstetric and family history (FH), results of work up performed, and delivery and infant outcomes.

RESULTS: 29 cases of NIHF were identified. Cohort characteristics included a median maternal age of 31 years (17-42), 44.8% (13/29) nulliparous, 6.9% (2/29) with a prior stillbirth, and another 6.9% (2/29) with a prior pregnancy with NIHF. There was one case each (3.5%) with a family history of stillbirth, recurrent pregnancy loss, early childhood death (unknown cause), hemoglobinopathy (Hemoglobin H disease), chromosomal abnormality (Down syndrome), and other genetic disorder (Friedrich's ataxia). Consanguinity was identified in 6.9% (2/29). Table 1 shows associated structural anomalies, genetic work up, and outcomes. In addition, infectious work up yielded results potentially of clinical significance in two cases (one + Parvovirus IgM, one + HSV IgM). A clear etiology of the NIHF was felt evident in 17.2% (5/29).

CONCLUSION: Structural congenital anomalies were present in 65% of NIHF cases, although a genetic diagnosis was not clearly established in the majority of cases. The work up performed for NIHF was very variable, and points to the need for further research to clarify the optimal pathway for evaluation.

	Structural Anomalies, Work Up, and Outcomes	Value
Congenital anomalies	Cardiac	18.5% (5/27)
	Genitourinary	11.1% (3/27)
	Congenital diaphragmatic hernia	11.1% (3/27)
	Sacrococcygeal teratoma	7.4% (2/27)
	Congenital pulmonary airway malformation	11.1% (3/27)
	Other	11.1 (3/27)
Genetic testing [a]	Chromosomal abnormality	12.5% (2/16) [b]
	Copy number variant by CMA	5.9% (1/17) [c]
	Abnormality on RASopathy or hydrops panel	16.7% (1/6) [d]
	Lysosomal storage disease	0% (0/1)
	Abnormality on whole exome sequencing	0% (0/1)
Pregnancy outcome	Stillbirth or spontaneous loss	23.1% (6/26)
	Pregnancy termination	23.1% (6/26)
	Living infant at birth	30.8% (8/26)
	Neonatal death	23.1% (6/26)
	Median gestational age at delivery (weeks)	36.2 (27.4-39.1) [e]

CMA, chromosomal microarray analysis. LSD, lysosomal storage disorder.
[a] Out of cases in which these tests were sent.
[b] Abnormalities were Trisomy 21 and chromosome 2 inversion.
[c] Abnormality was Trisomy 21.
[d] Rasopathy and hydrops panels sent. Abnormality was a pathogenic mutation in *PTPN11*.
[e] Of cases with a liveborn neonate

438 Accuracy of selective fetal echocardiography for the diagnosis of congenital heart disease in patients with pregestational diabetes stratified by hemoglobin A1c

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OBJECTIVE: To evaluate the accuracy of antenatal diagnosis of congenital heart disease (CHD) in patients with pregestational diabetes using screening methods including a combination of elevated hemoglobin A1c, level II ultrasound, and fetal echocardiography.

STUDY DESIGN: Retrospective cohort study of all pregnancies complicated by pregestational diabetes from 1/2012-12/2016 with an early hemoglobin A1c <20 weeks gestation who underwent both a level II ultrasound and fetal echocardiography. Sensitivity, specificity, PPV, and NPV were calculated for each screening regimen. Absence of congenital heart disease was confirmed by either a normal postnatal exam or normal neonatal echocardiogram.

RESULTS: 378 patients met inclusion criteria during the study period with an overall prevalence of CHD of 3.97% (n=15). When compared to level II ultrasound, fetal echocardiography had a higher sensitivity (73.3% vs. 40.0%) and slightly lower specificity (98.9% vs. 100%). All clinically significant CHD was detected by level II ultrasound (n=6) with the remainder being septal defects. Early A1c was higher in pregnancies affected by CHD (9.0%; IQR: 6.4-9.9 vs. 7.1%; IQR: 6.1-8.6, p=.034). A ROC curve showed an A1c of >7.7% as the best cut off for detection of CHD (AUC: 0.66, p=.038). An elevated early A1c >7.7% combined in parallel with level II ultrasound resulted in a sensitivity and specificity of 84.0% and 65.4%, respectively. The negative predictive value for all screening regimens was high (level II: 97.6%; level II + A1c 99.0%; fetal echo 98.9%). The use of selective fetal echocardiography for an A1c >7.7% or abnormal level II ultrasound would result in a 57.2% reduction in the use of fetal echocardiography with a similar detection rate as universal fetal echocardiography.

CONCLUSION: The use of selective fetal echocardiography in pregnancies complicated by pregestational diabetes with an early A1c >7.7% would result in a substantial cost savings with a similar detection rate when compared to universal echocardiography. Overall, fetal echocardiography appears to have limited value as a level II ultrasound detected all cases of clinically significant CHD.