Prenatal Prediction of Pulmonary Hypoplasia Using the Maternal Hyperoxygenation Test and Neonatal Outcome

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• An increase in the fetal blood flow with oxygen (a decrease of ≥ 20% in the PI) was considered positive for pulmonary reactivity.
**Background**

Pulmonary hypoplasia may be defined as incomplete or underdevelopment of lung tissue that is present at autopsy, it continues to significantly affect the outcome of newborns.

- Maternal hyper oxygenation test (MHT) is used to assess fetal pulmonary hypoplasia by having the pregnant women breath 100% oxygen and assessing the change in the blood velocities in the fetal pulmonary arteries.
• A 20% decrease in the pulsatility index (PI) of the PA in the fetus after 30 weeks gestation is normal.

Methods

MHT test was performed on 9 pregnant women (median maternal age 28.5 years) with fetuses (median gestation 31.5 weeks) with congenital anomalies that may cause pulmonary hypoplasia. (HLHLS (n=2), L CDH (n=2), Epstein with pulmonary atresia (n=1), TOF with absent pulmonary valve (n=1), prune belly syndrome (n=1), lung hypoplasia of unknown etiology (n=2).
• During MHT the Doppler blood velocity pattern and PI in the first branch of either pulmonary artery were obtained before and 10-15 minutes after maternal breathing of 100% oxygen was obtained for each fetus. at ≥30 weeks GA.

Results

• Of the 9 fetuses tested, 5 (55%) had a reactive MHT and all were delivered and alive and well. Of the 4 fetuses (45%) who had a non reactive MHT (bilaterally small pulmonary arteries with abnormal pulmonary venous flow pattern;) 2 died in the early neonatal period and 1 had unknown outcome.
Conclusion

• Preliminary data suggest that testing fetal pulmonary vascular reactivity with MHT could be useful in assessing pulmonary vascular responsiveness prenatally and in predicting the neonatal outcome.
HLHS /IAS

RA

RV
HLHS
HLHS

HLHS
Pulmonary Artery PI

Thank you!