Accuracy Of MCA Doppler At 28-38 Weeks In The Diagnosis Of Intrauterine Growth Restriction Among High Risk Pregnant Women

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Introduction

Intrauterine growth restriction (IUGR) is a problem faced by obstetrical care providers almost on a daily basis, accounting to about 10% of the general population.

IUGR is associated with adverse perinatal outcomes such as in utero demise, brain injury, fetal distress, hypoglycemia, among others. It is therefore important to distinguish fetal growth restriction from small for gestational age fetuses but are achieving their expected growth potential --- the constitutionally small fetuses.

In the diagnosis of IUGR, at least 2 ultrasound growth assessments at 2-3 week interval are needed to detect absence of expected growth. Management may often be delayed until a definite diagnosis is made. Once diagnosed, IUGR warrants close fetal surveillance and monitoring.

In monitoring these growth restricted fetuses, Doppler studies play an important role where in the presence of fetal hypoxia, central re-distribution of blood flow occurs, resulting in the brain sparing reflex. In healthy fetuses, the cerebral circulation is of high impedance, however, central blood flow re-distribution manifests as increased diastolic flow with decreased indices.

Objective

To investigate the use of MCA Doppler at 28-38 weeks age of gestation in the diagnosis of Intrauterine growth restriction among high risk pregnant women.

Methodology

A prospective cross-sectional study done from March 1, 2017 to December 31, 2017 with 90 high risk pregnant women who underwent fetal biometry at 28-38 weeks age of gestation. If the estimated fetal weight is <10th percentile, MCA Doppler was done & MCA PI noted (MCA PI). After 2 weeks, repeat biometry & MCA Doppler done (MCA PI). Those with no interval growth after 2 weeks were assigned as IUGR while those with interval growth as constitutionally small. MCA Doppler with decreased PI was considered a positive test while a normal to high PI was considered as a negative test.

Results

There is a significant association between growth restriction & MCA PI, with a sensitivity of 52% & specificity of 100%. 12 true negatives were correctly identified, with a positive predictive value of 100% & negative predictive value of 84% as there were cases that resulted into no growth. Accuracy is 86.7%. Out of the 90 test outcomes, 78 of them were the correct result.

MCA PI after 2 weeks showed that out of the 90 subjects, 18 had abnormal/ positive test with no interval growth. 7 showed no interval growth, but with within normal/ negative MCA PI. For those with interval growth, 65 had normal MCA PI, & showed the same results for MCA PI on follow up. MCA PI has a sensitivity of 72%, specificity of 100%, positive predictive value of 100% & negative predictive value of 72%. Accuracy is 92.2%. Out of the 90 test outcomes, 7 did not show the correct result.

Conclusion

MCA Doppler is a useful tool in helping us make a diagnosis of IUGR among high risk pregnant women at 28-38 weeks age of gestation. There is a significant association between MCA PI & interval growth. The accuracy of MCA PI on initial visit is 86.7% thus, we can classify the small for gestational age fetuses into the truly growth restricted & the constitutionally small for age, and therefore allow us to institute immediately the necessary management for these cases.