

## Differential effect in corpus callosum development in fetuses with Congenital Heart Defect assessed by ultrasound

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### Objective

To evaluate corpus callosum (CC) development by neurosonography (NSG) in fetuses with isolated cardiac heart defect (CHD).

### Methods

Prospective observational study including 56 fetuses with CHD and 40 controls. Fetuses with structural brain malformations, other congenital malformations, chromosomal abnormalities, perinatal infections and non-cephalic presentations were excluded. Fetuses with CHD were divided into: class A with an expected severe reduction in oxygenated brain blood supply (left outflow tract obstruction and transposition of great vessels) and class B with expected nearly normal or mildly impaired oxygenated brain blood supply. Transvaginal NSG was performed at 33±2 weeks to obtain midsagittal plane to evaluate the CC. Images were processed off-line obtaining length, total area, areas of Witelson's subdivision. Analysis was adjusted by gestational age at NSG, fetal head circumference, gender, and growth centile at birth.

### Results

CHD fetuses showed significantly smaller CC with linear tendency across the groups (CHD class A: 7.53mm<sup>2</sup> vs. CHD class B: 8.18 vs Controls: 9.08,  $p < 0.05$ ). Regarding regional changes, CHD class A showed significant reduction in all areas from the genu to splenium, while CHD class B only had differences in the anterior midbody area.

### Conclusion

Fetuses with CHD presented smaller CC being this reduction more marked in CHD associated with poor oxygenated brain flow. These data support the hypothesis that negative effects in brain development could be related with the degree of impaired brain blood flow. In addition, our results demonstrate the value of CC assessed by NSG as imaging biomarker of white matter development in fetuses at risk.