

## **Longitudinal changes of cardiovascular parameters in fetuses with congenital atrioventricular block**

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### **Objective**

To determine the longitudinal behavior of fetal cardiac morphometric and functional parameters throughout gestation in fetuses with autoimmune associated congenital atrioventricular block (AVB).

### **Methods**

Fetal biometrics, conventional doppler and cardiovascular morphometric and functional parameters were serially performed in a cohort of consecutive fetuses diagnosed with AVB. Evaluations were performed at various points from diagnosis to delivery, with at least 2 measurements performed for each fetus, at least 1 week apart. All parameters were transformed into z-scores or multiples of the median (MoM). A linear regression and correlation analysis was performed for each parameter to assess their behavior throughout gestation.

### **Results**

A total of 31 ultrasound evaluations were performed on 9 AVB fetuses, with a median of 3 measurements per fetus. AVB fetuses' conventional doppler parameters (umbilical artery, middle cerebral artery (MCA) pulsatility index (PI) and cerebroplacental ratio) were stable during evaluations. MCA peak systolic velocity MoM and aortic isthmus PI decreased significantly from the moment of diagnosis till birth ( $p=0.004$  and  $0.027$ , respectively), with no change in ductus arteriosus PI. There was a continuous decrease of ventricular fetal heart rate throughout gestation ( $p=0.040$ ), with stable cardiac output values for both ventricles, when adjusted by estimated fetal weight. Finally, both left and right sphericity indices increased throughout gestation ( $p=0.016$  and  $0.022$ ), due to a constant decrease observed in both ventricular inlet measurements, with stable end-diastolic diameters.

### **Conclusion**

AVB fetuses present conventional doppler parameters that tend to remain stable during pregnancy. Morphometric and functional cardiovascular parameters tend to evolve towards more large, rounded hearts with fetal heart rate decreasing but sustaining cardiac output values towards the end of gestation.