**EP 10.22**

The reference ranges for pulsed wave Doppler measurements in fetal echocardiography for the Japanese population.

**Introduction:** Fetal echocardiography permits the detailed diagnosis and assessment of most forms of congenital heart diseases (CHD). The importance of the reference ranges of the normal heart structure have been reported.

**Objective:** Deviation of a pulsed Doppler value in fetal echocardiography suggests the existence of undetermined heart diseases. However, there is racial variation in fetal development and fetal heart size. The aim of this study is to establish the reference ranges for pulse Doppler parameters using fetal echocardiography for Japanese population and to compare the values with previous reports from other countries.

**Methods:** Japanese women with uncomplicated singleton pregnancy with normal fetal hearts were enrolled. A Doppler evaluation of the fetal blood flow across the aortic valve (AO), pulmonary valve (PA), and ductus arteriosus (DA) was performed prospectively and measured peak velocities. The ratio of the peak systolic velocity in the ductus arteriosus to peak velocity in the pulmonary artery (DA/PA ratio) was calculated.

**Results:** One hundred ninety-five Japanese uncomplicated fetuses from 20 to 35 weeks of gestational age were included, and the gestational age-specific reference ranges for the Doppler measurements were established. The peak velocity of the PA and AO and DA increased with advancing gestational age (p<0.001) (Figure 1). The mean DA/PA ratio was 1.26 (SD 0.32) (95% CI 1.21-1.31) (Figure 2).

**Conclusion:** This study provides gestational age-specific reference ranges for the blood flow velocity waveforms of normal Japanese fetuses. In our study, the peak systolic velocities in the pulmonary and aortic artery and DA after 24 weeks of gestation were lower than the values reported in previous studies from other countries. A similar result was regarding the DA/PA ratio reported in the previous report.

![Figure 1](image1.jpg)

**Figure 1:** Individual values for peak velocities of PA, AO and DA plotted on the appropriate reference range (5%, 50% and 95%) with GA.

![Figure 2](image2.jpg)

**Figure 2:** The DA/PA ratio did not change with GA.