Utility of novel fetal echocardiographic measurement formula to detect coarctation of the aorta in Fetus: A retrospective single center experience.

Yoichiro Ishii, Masayoshi Mori, Masaki Hirose, Kumiyo Matsuo, Yasuhiro Hirano, Hisaaki Aoki, Kunihiko Takahashi, Shigemitsu Iwai and Futoshi Kayatani
Osaka Women’s and Children's Hospital, Department of Pediatric Cardiology and Department of Cardiovascular Surgery

Introduction

Prenatal recognition of coarctation of the aorta (CoA) is important as it may improve neonatal survival. It can be still challenging, with relatively high false-positive and false-negative rates. We aimed to identify novel fetal echocardiographic measures formula to predict prenatal identification of CoA.

Materials and Methods

- Each 10 consecutive patients with
  ①CoA
  ②suspected CoA
  ③normal heart
- Measured the length of the parts shown in Figure 1
- Calculated several ratios including carotid-subclavian artery index (CS index)
  *CSI = distal Arch/2nd-3rd distal arch ②/3rd arch distance

Results

Of our 30 subjects, the diameters of each parts were not significantly different. Whereas, the mean CS index (P<0.01) and PV/AV valve (P=0.04), DA/isth value (P=0.03) were significantly different. To make these prominent, we multiplied these values respectively. The formula, which means (PV/AV) *(DA/isth) *(1/CSI) predicted the need of CoA repair after birth (P<0.001). The ROC curves of this formula showed AUC of 0.94 and cutoff value of 3.3 had 94% sensitivity and 90% specificity.

Conclusion

(PVD/AVD) *(Duct/isthmus) *(1/carotid-subclavian index) is useful in predicting prenatal CoA who need surgical repair after birth.