

# (EP09.35) Comparison of clinical utility between previous and newly developed Korean z-scores for prenatal diagnosis of coarctation of the aorta

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## Introduction

To evaluate the diagnostic performance of newly developed Korean z-scores for fetal aortic isthmus measurements in the prenatal detection of coarctation of the aorta (CoA) and compare them with previously established z-scores.

## Methods

A retrospective cohort study was conducted on fetuses prenatally suspected of CoA at Asan Medical Center between January 2010 and December 2022. CoA suspicion was based on an aortic isthmus z-score of  $\leq -2$  in the three-vessel-trachea view (3VTV) or sagittal view on fetal echocardiography, according to previously reported z-score models. The same cases were re-evaluated using the newly developed Korean z-scores. The final postnatal diagnosis of CoA was confirmed via echocardiography or cardiac computed tomography. Sensitivity, specificity, accuracy, positive predictive value (PPV), and negative predictive value (NPV) were compared between the different z-scores of aortic isthmus.

## Results

A total of 224 fetuses were analyzed. When assessed in the 3VTV, the Korean z-scores based on head circumference demonstrated improved specificity over previously established models, which showed high sensitivity but limited specificity (e.g., sensitivity 91.0%, specificity 27.6%). Among the newly developed models, the head circumference-based z-score achieved the highest PPV (47.9%), enhancing predictive accuracy for positive cases. In the sagittal view, the gestational age-based Korean z-score model exhibited the highest PPV (43.8%), further supporting its diagnostic utility

## Conclusion

The implementation of newly developed Korean z-scores for fetal aortic isthmus evaluation may enhance the diagnostic accuracy of CoA by addressing the specificity limitations inherent in previously reported reference models.

| 3VTV_Ao isthmus     |     | Accuracy (%) | PPV (%) |
|---------------------|-----|--------------|---------|
| Korean reference    | GA  | 0.552        | 0.452   |
|                     | BPD | 0.582        | 0.474   |
|                     | HC  | 0.587        | 0.479   |
|                     | AC  | 0.557        | 0.450   |
|                     | FL  | 0.567        | 0.462   |
|                     | EFW | 0.582        | 0.473   |
| L.Pasquini et al.   | GA  | 0.498        | 0.429   |
|                     | FL  | 0.522        | 0.444   |
| Sagittal_Ao isthmus |     | Accuracy(%)  | PPV (%) |
| Korean reference    | GA  | 0.549        | 0.438   |
|                     | BPD | 0.536        | 0.424   |
|                     | HC  | 0.549        | 0.437   |
|                     | AC  | 0.545        | 0.429   |
|                     | FL  | 0.540        | 0.425   |
|                     | EFW | 0.536        | 0.422   |
| L.Pasquini et al.   | GA  | 0.509        | 0.418   |
|                     | FL  | 0.536        | 0.433   |
| A.Krishnan et al.   | GA  | 0.402        | 0.376   |
|                     | BPD | 0.433        | 0.391   |
|                     | FL  | 0.491        | 0.412   |
|                     | EFW | 0.500        | 0.417   |

Table 1. Comparison of the accuracy of aortic isthmus using each references