

Sonographic nomograms for fetal aortic arch from 12 to 40 weeks' gestation: a systematic review

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Objectives

To review existing data and evaluate methodological quality of normal reference values of aortic arch measurements by 2D ultrasound.

Method

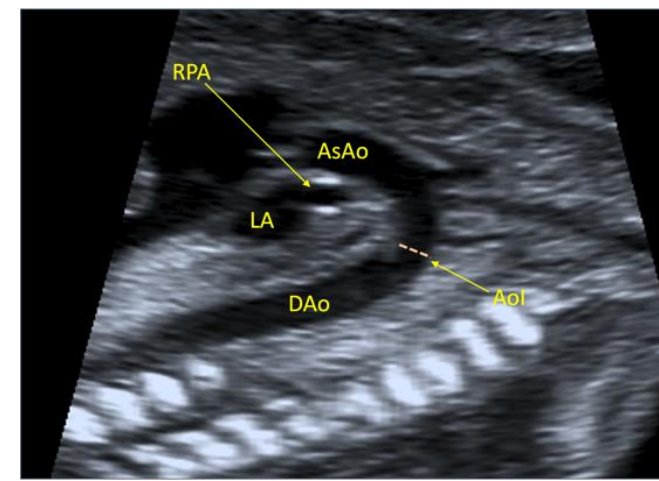
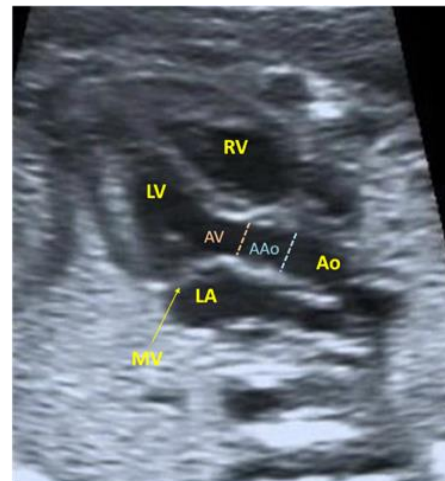
A systematic review of the literature was performed using the MEDLINE, EMBASE, Web of Science and SCOPUS from its inception to November 2024. The inclusion criteria were healthy singleton, normally grown, non-anomalous human fetuses in uncomplicated pregnancies from 12 to 40 weeks' gestation. The biometric variables assessed as main outcomes were transverse aortic arch and aortic isthmus.

Quality assessment criteria included two domains: study design (12 criteria); and statistical and reporting methods (16 criteria).

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Results

35 studies met the inclusion criteria embracing 39256 fetuses. They were published between 1984 and 2024 and most of them were cross-sectional studies (only one study was longitudinal). The mean $\pm$ SD overall quality score was $68 \pm 13\%$. The highest risk of bias was noted in terms of calculating the sample size and describing the characteristics of the population which was done only in 31% and 14% respectively). There was different report of the measurements: mean and SD (74%), regression equations (66%) and scatter diagrams (40%). No study reported all measurements of the aortic arch. In the sagittal view, 5 studies (14%) reported the aortic valve, ascending aorta, and transverse aortic arch; 10 studies (29%), the aortic isthmus; and 7 studies (20%), the descending aorta. In 3-vessel view, 9 studies assessed the aorta and only 4 of them (11%) reported transverse aortic isthmus.



Conclusions

The lack of a standardized framework for interpreting fetal aortic measurements presents a challenge in clinical decision-making and impedes reliable comparison of findings across different studies.

Figure 1. The most frequent evaluated parameters in the literature.