

Prenatal series of first trimester cardiac anomalies with sonopathological correlation: Series of 100 cases: Lessons learnt

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Objective

Evaluation of cardiac anatomy at first trimester by a systematic approach has come into practice over the last decade. Considering the limitations of the same, we wanted to determine the degree of agreement between cardiac anomalies diagnosed at first trimester USG & perinatal pathological evaluation & factors impacting the same to enable accurate reporting & counselling of patients.

Methods

This was a retrospective study carried out at Mediscan Systems which is a tertiary care fetal medicine centre in South India with a large perinatal pathology & fetal medicine unit. First trimester scans performed between January 2012 to December 2017 were taken as part of the study. All the singleton pregnancies with fetuses detected with cardiac anomaly at first trimester scan were searched for in the hospital database. The cases wherein perinatal autopsy was performed were subgrouped and only formed the study cohort. In the cases retrieved, data on other parameters like maternal Body mass index (BMI) at the time of scan, fetal crown rump length (CRL) and the presence of aneuploidy marker or multisystem anomaly, if any, were analysed. The pathology data were reviewed and findings were revisited from the stored images. The study period was subdivided into two cohorts of three years each, the first one being between the years 2012-2014 and the second one between the years 2015-2017. All cases were divided into three categories (Complete match, partial match, mismatch) to study the correlation between ultrasound and autopsy findings. Minor anomalies which are not a part of the standard ultrasound evaluation protocol or the ones which are difficult to standardize were not used for matching.

Results

Out of the total 33432 scans performed in the first trimester during the study period, there were 479 fetuses with cardiac anomaly. 89 (18.5%) had perinatal pathological evaluation. 80 of these cases met with the inclusion criteria for the study. Complete match was seen in 62%, partial match in 28% and mismatch was noted in 10% of the cases. In the partial match group additional information on outflow tract anatomy was provided on autopsy. When the correlation between the two cohorts in terms of diagnosis accuracy was studied, we found that the imaging accuracy has significantly become better in the second cohort (2015-2017) from 49% to 76%. The correlation was only 50% when the BMI was more than 30. The results did not show statistically significant difference in sonopathological correlation between the cases grouped on basis of CRL as <60 and ≥60.

Conclusion

The present study shows that the use of a systematic checklist helps improving the imaging accuracy of first trimester cardiac assessment. The prenatal diagnosis of major cardiac anomaly showed complete correlation in 62% cases with autopsy providing additional information in 28% cases with no false positives. Hence the primary diagnosis was correct in 90% cases. In a comparison of the two time periods 2012-2014 and 2015-2017, the improvement in diagnosis was significant. BMI and CRL do impact the first trimester screening but the difference is not statistically significant for the later. This study enables us to provide valuable inputs on reporting methodologies from lessons learnt on autopsy & also provides information on counselling patients when faced with a diagnosis of a cardiac anomaly at first trimester.