

## **Left Atrial Function during Pregnancy: A 3-Dimensional Echocardiographic Study**

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Introduction: During normal pregnancy maternal cardiac function adapts to increased volume loading. It has been suggested that deviation from normal cardiac systolic function may serve as early signs of Preeclampsia and fetal growth restriction these conditions.

We hypothesize that volumetric and functional LA parameters can be better detected by RT3DE and thus enable us to study changes in LA function as pregnancy progresses.

Patients and Methods: We studied three groups each with 20 healthy subjects: Pregnant women in early third trimester (EIII), pregnant women in late third trimester (LIII), and control non-pregnant women. The women were studied for 2 and 3 Dimensional Echo measurements was obtained using IE33 3D Echo machine (BORTHEL Phillips). The following variables were measured: peak flow velocity in the early diastole (E wave), and during atrial contraction (A-wave). 3D The parameters measured included: CO= Cardiac Output, PHT= Pulmonary Hypertension, ejection fraction (EF), Left atrial end-diastolic diameter (LAEDD), Left atrial end-diastolic area (LAED Area), 3 Dimensional Left atrial end-systolic volume index (3D LAESVI), , 3 Dimensional Left atrial end-diastolic volume index (3D LAEDVI), 3 Dimensional Left atrial stroke volume index (3D LAESVI).

Results: Using the routine 2D Echo method revealed no change in LA diameter from baseline to EIII and LIII respectively (from  $17.1 \pm 2.3$  to  $16.7 \pm 2.6$ ,  $17.5 \pm 2.2$  mm) and area ( from  $14.7 \pm 3.1$  to  $14.5 \pm 2.3$ ,  $17.6 \pm 1.6$  cm<sup>2</sup> ). However, using the 3D Echo method, significantly increase in the LASV', LAEDV' and LA stroke volume index (from  $12.02 \pm 2.5$  to  $14.7 \pm 3.2$  and  $15.1 \pm 2.7$  ml/m<sup>2</sup>), was detected.

Conclusions: Using RT3DE, we were able to demonstrate an increase in left atrial volume, beginning in early third trimester of normal pregnant women. The augmented atrial volume reflects a general cardiac volume increase, and is translated into increased cardiac output.