

Evaluation of Normal Fetal Heart Function by Novel Obstetrics Ultrasound

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ABSTRACT

In the ultrasound assessment of fetal myocardial function, both M-mode imaging and color Doppler imaging have been popularly applied. Recently, obstetrics ultrasound can evaluate the fetal heart function from specialized multiple perspectives.

Keywords: Fetal heart function, sphericity index, vector velocity index

COMMENTARY

The First method in evaluating the fetal heart function was, speckle tracking method which possibly analyzes the fetal ventricular shape and contractility, length and width base on fore-chamber view. The Second method was, global sphericity index (SI) which shows end-diastolic longitudinal length–end-systolic longitudinal length which could be makeable formation of heart. The Third method was, twenty-four (24) segment tracking technique in which we can measure the size and function of fetal heart. Also SI conducted by 24 end-digastric transverse segment to analyze SI of the ventricle. Furthermore, vector velocity index (VVI) visualizes the quantification of velocity and strain without the limitations of ultrasonic refraction angles. VVI demonstrates the increasing vector velocities throughout normal gestation.

IMAGE ACQUISITION USING ULTRASOUND.

1. Voluson E10 & fetal HQ (GE healthcare, Milwaukee, WI)
2. ACUSON2000& VVI (Mochida Siemens Medical System, Japan)

These are the two systems which are used to obtain two-dimensional images of the fetal 4-chamber view both the fetal 4-chamber view [1]. The common point which is the endocardial border for ventricle was traced from the lateral wall to the apex and from the apex to the base of the septal wall between two ultrasounds [2].

TO KNOW WHAT OF FETAL HEART FUNCTION

1. Endocardial global longitudinal strain [3].

2. End diastolic and systolic area
3. Fractional area change
4. End systolic length, End systolic diameter
5. End diastolic length, End systolic diameter
6. Global Analysis of heart/ Z-score [4].
7. Ventricular analysis of end diastolic diameter / Fractional Diameter
8. Sphericity Index [5].
9. Ejection fraction [6].
10. End diastolic volume, End systolic volume
11. Global longitudinal velocity [7].
12. Segmental longitudinal velocity of systolic, and diastolic
13. Global longitudinal systolic strain and strain rate
14. Ventricular size and Shape
15. Ventricular Contractility [8]

We have presented that the fetal ventricular function increases throughout the gestational age, and global longitudinal velocity of the fetal ventricle during the third trimester had not mentioned any significance that differ between fetal growth restriction (FGR) and normal fetuses or FGR cases, diastolic of left ventricle (LV) and right ventricle (RV) s in hypertensive disorders of pregnancy (HDP) cases seemed low, but there was no significant difference to the without HDP cases using VVI methods [9]. However, the latest ultrasound techniques can not only determine fetal heart

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malformations [10] but also to evaluate and visualize the details of myocardial and ventricular functions. That application which can present the information of the fetal heart development during the entire gestation period.

CONCLUSION

I suggest that novel obstetric ultrasound would find out more differences between heart function of normal fetus to abnormal growth fetus, and also determines several characters and decrees fetal heart function with congenital heart. Epically, 24-segment sphericity index and velocity vector index should enable clinicians to evaluate the maturity and distress status of the in utero cardiovascular system, resulting as a new marker helpful for determining perinatal termination. The most important issue is to create a standard value for fetal heart function using novel obstetric ultrasound.

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CONFLICT OF INTEREST

All authors have no conflicts of interest.

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