

## Best Approach for Diagnosing Fetal Cardiac Anomalies in Pregnancies Complicated With Pre-Gestational Diabetes

Ahmed A Nassr<sup>1,2</sup>, Sherif A Shazly<sup>1,2</sup> and Sherif A El-Nashar<sup>1,2\*</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Mayo Clinic, USA

<sup>2</sup>Department of Obstetrics and Gynecology, Assiut University, Egypt

**\*Corresponding Author:** Sherif A El-Nashar, Department of Obstetrics and Gynecology, Mayo Clinic, Rochester, MN 55905, USA, Department of Obstetrics and Gynecology, Assiut University, 71526, Egypt.

**Received:** June 15, 2015; **Published:** June 20, 2015

Pre-existing Diabetes Mellitus (DM) is a frequently encountered medical condition during pregnancy. While type-I DM is estimated to complicate up to 0.5% of all pregnancies, the current epidemic of obesity increases the incidence of type-II DM which complicates about 2% of all pregnancies or even higher in certain ethnic groups [1]. One of the major concerns in pre-gestational DM complicated pregnancies is the risk of congenital structural malformations particularly those involving the fetal cardiovascular system; the risk of fetal cardiac structural abnormalities is 10 times higher compared to the general population [2].

The value of accurate prenatal diagnosis of fetal congenital cardiac abnormalities is well documented as it allows for optimizing both preoperative [3,4] and postoperative circumstances [4-6] as well as having a favorable impact on neurological outcome [7] and consequently, prevention of avoidable postnatal morbidity and mortality. It also provides an excellent opportunity, either during intrauterine or neonatal period, for prenatal medical and surgical interventions that could be potentially lifesaving [3,8]. Although, the best strategy for prenatal diagnosis of those abnormalities is to screen all women with pre-gestational DM pregnancies with fetal echocardiography, it is not always a cost-effective strategy to adopt especially in the settings of low resource health institutions. It is worthy to mention that the cost of fetal echocardiography in US could be in the range of 2571\$ when pulsed wave and color Doppler are used during evaluation according to national market reference point estimate (fairhealth.org, New York, NY).

The glycemic control and glycosylated hemoglobin A1c are the most important determinants of the risk of congenital cardiac malformations in diabetic pregnancies, Shields, et al. reported no cases of congenital heart disease among the pregnant diabetic population with normal HgA1c [9]. However, no specific cut-off values of HgA1c have been confirmed to be most predictive for congenital cardiac structural abnormalities [9]. Obido, et al. found that selective screening by fetal echocardiography after abnormal fetal anatomic survey is more cost effective approach for congenital heart diseases in diabetic patients after comparing four strategies of no screening, screening after abnormal anatomic survey, screening after abnormal HgA1c and universal screening in a cost effective analysis model [10]. Since first trimester HgA1c is now routinely evaluated in most centers, adopting a strategy of screening based on second trimester fetal anatomic survey and HbA1c could result in comparable accuracy with cost benefits compared to universal screening policy.

It is authors' view is that this concept deserves testing by a large randomized trial since it is likely to standardize practice and offers cost benefit particularly in low resource settings.

### **Bibliography**

1. Kapoor N., *et al.* "Diabetes in pregnancy: a review of current evidence". *Current Opinion in Obstetrics and Gynecology* 19.6 (2007): 586-590.
2. Tabib A., *et al.* "Cardiac malformations in fetuses of gestational and pre gestational diabetic mothers". *Iranian journal of pediatrics* 23.6 (2013): 664-668.
3. Schultz AH., *et al.* "Epidemiologic features of the presentation of critical congenital heart disease: implications for screening". *Pediatrics* 121.4 (2008): 751-757.
4. Tworetzky W., *et al.* "Improved surgical outcome after fetal diagnosis of hypoplastic left heart syndrome". *Circulation* 103.9 (2001): 1269-1273.
5. Bonnet D., *et al.* "Detection of transposition of the great arteries in fetuses reduces neonatal morbidity and mortality". *Circulation* 99.7 (1999): 916-918.
6. Franklin O., *et al.* "Prenatal diagnosis of coarctation of the aorta improves survival and reduces morbidity". *Heart* 87.1 (2002): 67-69.
7. Mahle WT., *et al.* "Impact of prenatal diagnosis on survival and early neurologic morbidity in neonates with the hypoplastic left heart syndrome". *Pediatrics* 107.6 (2001): 1277-1282.
8. Mcelhinney DB., *et al.* "Current status of fetal cardiac intervention". *Circulation* 121.10 (2010): 1256-1263.
9. Shields L., *et al.* "The prognostic value of hemoglobin A1c in predicting fetal heart disease in diabetic pregnancies". *Obstetrics & Gynecology* 81.6 (1993): 954-957.
10. Odibo AO., *et al.* "Should all pregnant diabetic women undergo a fetal echocardiography? A cost-effectiveness analysis comparing four screening strategies". *Prenatal diagnosis* 26.1 (2006): 39-44.

**Volume 1 Issue 3 June 2015**

**© All rights are reserved by Sherif A El-Nashar, *et al.***