First-Trimester Fetal Cardiac Imaging

Moderator: Reem Abu-Rustum, MD

Evaluating the Fetal Heart in the First Trimester: The Basics

Reem Abu-Rustum *Center for Advanced Fetal Care, Tripoli, Lebanon*

The aim of this presentation is to address the basics of evaluating the fetal heart in the first trimester. The scope of the problem of congenital heart disease will be presented. The impact that the ever-expanding global implementation of nuchal translucency (NT) measurement has had on the more recent call for the incorporation of a full fetal anatomic survey, including the fetal heart, at the time of NT assessment, will be discussed in the wake of noninvasive prenatal testing using cell-free fetal DNA. The critical role of the NT as a key risk factor for underlying congenital heart disease will be presented. In addition, there will be a general overview of the basic fetal cardiac anatomy and cardiac views, together with the anatomic landmarks, that may be evaluated at the time of NT assessment. Finally, the learning curve associated with the implementation of fetal echocardiography in the first trimester will be presented.

1799345 Differences in the Size of Right and Left Choroid Plexuses at 11 to 13 Weeks: An Early Sign of "Developmental" Laterality?

Reem Abu-Rustum,[1]* M. Fouad Ziade,[2] Sameer Abu-Rustum[3]

[1]Center for Advanced Fetal Care, Tripoli, Lebanon; [2]Faculty of Public Health, Lebanese University, Tripoli, Lebanon; [3]Obstetrics and Gynecology, Nini Hospital, Tripoli, Lebanon

Objectives—To establish reference values for the right and left fetal choroid plexus (CP) length, area, and circumference at 11–13 weeks, with respect to the fetal biparietal diameter (BPD), and to compare the right to the left side.

Methods—A prospective study on 114 fetuses at 11–13 weeks undergoing first-trimester screening for aneuploidy and structural fetal abnormalities was conducted. After the establishment of the fetal situs, the plane of the "butterfly" was obtained on all fetuses from which the length, area, and circumference of both the right and left CP were obtained and the right and left sides compared. Using a paired *t* test, an analysis of variance test, scatterplots, and linear and logarithmic fittings, reference ranges and charts for the CP length, area, and circumference were then formulated according to their relationship to the fetal BPD. $P < .05$ was considered statistically significant.

Results—Reference values for the fetal CP length, area, and circumference, with respect to the fetal BPD, are established. There is a statistically significant difference between the right and left sides in all parameters, with all measurements statistically greater on the fetal left side ($P < .0001$).

Conclusions—To our knowledge, this is the first study that has aimed at establishing and comparing the reference values for right and left fetal CP length, area, and circumference in the first-trimester fetus at 11–13 weeks. Given the critical developmental role of the fetal CP, through its secretion of neuropeptides, growth factors, chemorepellents, and cytokines that serve to protect and repair, the evidence provided by our study in support of the left CP being statistically larger than the right leads us to ponder whether our findings could truly represent an early sign of "developmental" laterality.

1838465 First-Year Medical Students' Perceptions of the Importance of Ultrasound in Medical Education in Lebanon

Reem Abu-Rustum,[1,2]* Ziad Nehme,[2] Camille Nassar[2]

[1]Center for Advanced Fetal Care, Tripoli, Lebanon; [2]Faculty of Medicine, University of Balamand, Koura, Lebanon

Objectives—To evaluate first-year medical students' perceptions of the importance of ultrasound (US) in medical education.

Methods—Responses to precourse and postcourse surveys from 68 first-year medical students at the University of Balamand were collected. Using a 5-level Likert scale, the students were asked to respond if they felt US enhanced their understanding of anatomy and physiology, was beneficial, and should be integrated into all 4 years. In addition, the students were asked if they believed they would use US in the future, if US education should be universal, if the experience was positive, and if they would be willing to become "future instructors" to their juniors in US training. The data were analyzed using a *t* test and descriptive statistical approach. $P < .05$ was considered statistically significant.

Results—The response rates were 92.6% for the precourse and 94.1% for the postcourse surveys. Of the students, 87.3% precourse and 87.5% postcourse agreed/strongly agreed that US would enhance their understanding of anatomy. However, only 57.1% of the students, both precourse and postcourse, agreed/strongly agreed that US would enhance their understanding of physiology. There was a statistically significant difference in the students' responses, precourse and postcourse, with respect to US being beneficial ($P = .002$), the need for US integration into all 4 years ($P < .001$), the need for universal US integration ($P < .001$), foreseeing using US in their future clinical practice ($P = .05$), and rating US as an overall positive educational experience ($P = .001$). Of 63 responding students, 79.7% agreed/strongly agreed to becoming "future instructors" to their juniors in US training.

Conclusions—US integration into medical education is a most positive experience for first-year medical students serving to enhance their basic knowledge of anatomy. Their strong belief in US's clinical applicability in their future practice, the need to integrate it into all 4 years of medical education, and the need for its universal implementation, together with their willingness to serve as future instructors to their juniors, provides further evidence in support of the importance of global implementation of US in medical education.

1838466 Normogram for the Fetal Nasal Bone at 18 to 24 Weeks in a Lebanese Population

Reem Abu-Rustum,[1]* M. Fouad Ziade,[2] Assaad Kesrouani,[3] Sameer Abu-Rustum[4] *[1]Center for Advanced Fetal Care, Tripoli, Lebanon; [2]Faculty of Public Health, Lebanese University, Tripoli, Lebanon; [3]Obstetrics and Gynecology, St Joseph University, Hotel Dieu de France, Beirut, Lebanon; [4]Obstetrics and Gynecology, Nini Hospital, Tripoli, Lebanon*

Objectives—The fetal nasal bone (NB) is a second-trimester (ST) marker for aneuploidy that varies with ethnicity. The study's objective was to establish a normogram for the NB in an unselected low-risk Lebanese population and to investigate how to potentially correct for any ethnic variation.

Methods—A prospective study was conducted on 1001 fetuses with confirmed dating undergoing an ST scan at 18–24 weeks at 2 centers in Lebanon. NB was measured in a midsagittal plane, and the ratio of the biparietal diameter (BPD) to the NB was calculated. Twin gestations and cases with aneuploidy or structural abnormalities were excluded. All fetuses were term live births with a normal examination at birth. Regression analysis was used to establish the relationship between the NB and gestational age (GA). An analysis of variance test of means was used to establish the mean NB and to evaluate the changes in the BPD/NB ratio according to the GA. A t test or χ^2 test, as appropriate, was used to compare the different demographic characteristics and the NB and BPD/NB ratio between male and female fetuses. The normogram and the percentiles of the Lebanese NB, together with the ratio of the BPD/NB according to GA, were established. $P < .05$ was considered statistically significant.

Results—A total of 1001 fetuses were included in the analysis. Mean GA was 22.18 weeks. Mean NB was 8.17 mm. There were 48.5% female and 51.5% male fetuses. Our data revealed that the NB increases with GA ($P < .001$). In the Lebanese fetus, the NB tends to be larger than what has previously been established, but the BPD/NB ratio remains stable with advancing gestation, irrespective of fetal gender, with a mean of 6.6 ($P = .055$).

Conclusions—Our study demonstrates that in an unselected low-risk Lebanese population, the normogram for NB is different than what has previously been established, and the Lebanese NB tends to be larger. This ethnic variation may be corrected for by using the BPD/NB ratio, which remains stable irrespective of GA and fetal gender. Our findings stress the importance of prospective studies to determine the optimal BPD/NB cutoff to be used in our population as a potential marker for aneuploidy.