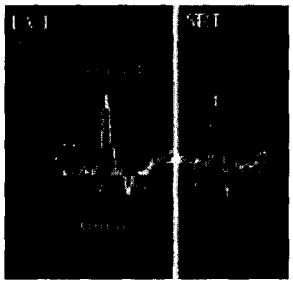
1216-160 **Strain Rate Imaging Is Superior to Tissue Velocity Imaging for Measuring Atrioventricular Time Interval in the Fetus**

Azaria JJT Rein, Zeev Perles, Amiram Nir, Ikuo Hashimoto, Xiaokui Li, David J. Sahn, Oregon Health & Science University, Portland, OR, Hadassah Hospital, Jerusalem, Israel

Background: We showed in a previous study that tissue velocity imaging (TVI) can accurately assess arrhythmias and atrioventricular conduction time intervals (AVI) in the fetus. Strain rate imaging (SRI) usually produces a clear, discrete signal of atrial wall deformation. This study, therefore, evaluated SRI as a method for AVI measurement in the fetus. **Methods:** 15 normal fetuses were studied using a Vivid FiVe scanner (GE, USA). 4-chamber-view-equivalents of the heart acquired as tissue velocity images were stored as raw scanline data cine loops (3 cardiac cycles/loop). TVI and SRI tracings were obtained by sampling simultaneously the right (R) or left (L) ventricular myocardium and R or L posterior atrial wall for both LAVI and RAVI (4 regions of interest for each method). AVI was calculated and averaged from TVI and SRI tracings obtained. **Results:** AVI measured by SRI was identical to that measured by TVI (RAVI-TVI success, 13/15, 85 ± 11 msec; RAVI-SRI 15/15, 85 ± 10; LAVI-TVI 12/15, 72 ± 8; LAVI-SRI 15/15, 74 ± 9). Feasibility of SRI was thus 100% compared with 87% and 80% for right and left atria respectively for TVI. Analysis time was significantly shorter using SRI: 3 ± 1 min versus 7 ± 4 min for TDI (p<0.01). Excellent inter- and intra-observer agreement was found in repeated studies for both TVI and SRI. **Conclusions:** SRI and TVI measurements of AVI are identical. SRI is superior to TVI for detecting atrial wall motion in the fetus, whereas TVI failed to clearly delineate atrial contraction in 10-20% of cases.



1216-161 **Two-Dimensional Echocardiographic Valve Measurements in 748 Healthy Children: Are Boys and Girls Different?**

Mark V. Zilberman, Philip R. Khoury, Thomas R. Kimball, Cincinnati Children's Hospital Medical Center, Cincinnati, OH

Currently published pediatric 2-D echocardiography data on cardiac valve dimensions are based on a relatively small (less than 200) number of subjects. Our aim was to create nomograms of echo 2-D valve dimensions based on a large group of children without heart disease.

Methods: 748 children (395 boys, 353 girls) aged 0-18, referred for chest pain, heart murmur, or syncope evaluation, underwent echocardiographic study. All children had normal cardiac structure, systolic and diastolic function. All four valves were measured at their maximal dimensions (aortic - in the parasternal long axis view, pulmonary - in the parasternal short axis view, mitral and tricuspid - in the apical 4-chamber view).

Results: Mean values and standard deviations were calculated and gender-specific Z-value nomograms based on regressions to both body surface area (BSA) (Table) and height were developed. Correlations with BSA were higher than with height for all valves. Surprisingly, there was a statistically significant gender difference in measurements for all 4 valves. Boys had higher valve annuli diameters than girls. This difference was also observed after the adjustments for both - BSA and height in ANCOVA (analysis of covariance) models.

Conclusion: When evaluated in a large group of children, there is gender-specific difference in cardiac valve dimensions adjusted for either BSA or height. Valve dimension correlations are higher with BSA than with height.

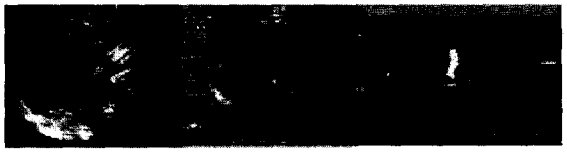
Gender-specific z-value formulae

Valve/Gender	Female	Male
Mitral	(lnMV-(.733+.408*lnBSA))/0.18	(lnMV-(.765+.425*lnBSA))/0.169
Tricuspid	(lnTV-(.755+.364*lnBSA))/0.186	(lnTV-(.817+.391*lnBSA))/0.171
Aortic	(lnAV-(.437+.461*lnBSA))/0.127	(lnAV-(.472+.492*lnBSA))/0.141
Pulmonary	(lnPV-(.597+.476*lnBSA))/0.144	(lnPV-(.618+.498*lnBSA))/0.152

1216-162 **Feasibility of Making Nursery Ductus and Echo Rounds With a Hand-Held Ultrasound System Equipped With a High-Frequency Probe**

Xiaokui Li, Grant H. Burch, Ron G. Ilg, De-Ann M. Pillers, Joseph T. Gilhooly, Sue Ann Smith, Linda D. Wallen, Cynthia T. McEvoy, David J. Sahn, Oregon Health & Science University, Portland, OR

Background: In this study, we tested a hand-held ultrasound scanner in a tertiary level nursery for evaluating ductal patency as well as for exclusion of congenital heart disease. **Methods:** Requested nursery studies were performed by our clinical echo lab staff with a Hewlett-Packard 5500 scanner or an Acuson Sequoia using 5-10 MHz probes. One hour later, the study was repeated by another blinded sonographer using a SonoHeart® hand-held scanner equipped with a curved array 6-11 MHz probe and amplitude mode directional color Doppler. Thirty-one infants < 1 week of age were studied (570-2750 gms). **Results:** The videotapes of both exams were compared by a third reader who judged that B-mode image quality on the SonoHeart® scanner was as good in detail, and sometimes was better in the near field; major heart disease was found in 6 babies, a VSD with pulmonary hypertension, mild TOF, AV defect (2) and coarctation (2) were each diagnosed correctly. On all other exams, there was complete concordance on findings of patency of the ductus arteriosus (closed, constricted, large, R panel) and directionality of the shunt. There was also complete concordance on atrial-septal patency and the direction of foramen ovale flow, except in 1 SGA baby, for whom the possibility of latent coarctation was determined on both exams (L panels) and later confirmed. Lastly, a close correlation for measurements of left ventricular dimension and fractional shortening was obtained between the two exams (r = 0.93).



ORAL CONTRIBUTIONS

863 Congenital Heart Surgery: Intra- and Post-Operative Monitoring

Tuesday, April 01, 2003, 4:00 p.m.-5:00 p.m.
McCormick Place, Room S106

4:00 p.m.

863-1 **Cerebral Oximetry as Noninvasive Indicator of Mixed Venous Oxygen Saturation in Newborns After Cardiac Surgery**

Janet M. Simsic, Scott M. Bradley, Martha R. Stroud, Andrew M. Atz, Medical University of South Carolina, Charleston, SC

Background: Near-infrared spectroscopy (NIRS) is gaining acceptance and now increasingly used for monitoring cerebral oximetry during cardiac surgery. The utility of this technology in the pre and postoperative management of patients with congenital heart disease has yet to be established. The purpose of this retrospective study was to determine whether a correlation exists between NIRS and currently used direct invasive measurements of mixed venous oxygen saturation in newborns after cardiac surgery. Methods: From October 2001 through April 2002, 15 newborns had cerebral oximetry monitored via NIRS (INVOS 4100, Somanetics Co, Troy, MI) for 24 hours after cardiac surgery. Mixed venous saturations via indwelling superior vena caval, right atrial or pulmonary artery catheters were simultaneously obtained and correlated with cerebral oximetry via NIRS. Number of observations per patient ranged from 1 to 5 (median 4). Eight patients underwent complete biventricular repairs (arterial switch, n=3; repair of tetralogy of Fallot, n=3; repair of total anomalous pulmonary venous return, n=1; repair of truncus arteriosus, n=1). Seven patients with functional single ventricles had palliative procedures (Norwood, n=5; modified Blalock-Taussig shunt, n=2). Results: Mixed venous saturations obtained via indwelling catheter correlated with cerebral oximetry obtained via NIRS with a Spearman rank correlation coefficient of 0.55 (p<0.001) and linear regression of R= 0.66, R2=0.44 (p<0.001). Conclusion: Cerebral oximetry via NIRS correlates with mixed venous oxygen saturations obtained via invasive monitoring. NIRS may be a useful non-invasive indicator of mixed venous oxygen saturations in newborns after cardiac surgery with less morbidity than currently used direct or invasive monitoring. Further prospective study is warranted.