P236: The cylindrical shape of ductus venosus in the first trimester of gestation

Article *in* Ultrasound in Obstetrics and Gynecology · January 2003

DOI: 10.1002/uog.701

6 authors, including:

Asunción Hervás Morón
Hospital Universitario Ramón y Cajal
296 PUBLICATIONS **1,815** CITATIONS

SEE PROFILE

F. A. P. Vasques
Universidade Federal de São Paulo
25 PUBLICATIONS **64** CITATIONS

SEE PROFILE

Luiz Nery
Universidade Federal de São Paulo
6 PUBLICATIONS **4** CITATIONS

SEE PROFILE

C. G. Almodin
Universidade Federal de São Paulo
36 PUBLICATIONS **204** CITATIONS

SEE PROFILE

P236
The cylindrical shape of ductus venosus in the first trimester of gestation

C. G. V. Murta*, A. F. Moron†, F. A. P. Vasques†, L. Nery†, T. R. M. Gonçalves†, C. G. Almodin† and F. H. C. Carvalho†

Federal University of Espírito Santo, Brazil and †Federal University of São Paulo – UNIFESP, Brazil

Objective: To investigate the geometric shape of the ductus venosus between 10–13 weeks of gestation.
Patients and methods: Ductus venosus measurements were performed in 64 normal human fetus using ultrasound color Doppler imaging. The geometrical measurements obtained were: length (n = 64), isthmic width (n = 34) and outlet width (n = 20). For statistical analysis, the analysis of variance, linear regression, Kruskal-Wallis terst and the Spearman correlation were used.
Results: At 10–13 weeks of gestation, the ductus venosus length indicates a continuous growth and the width did not change. The measurements (median) were: length = 2 mm, isthimic inlet = 1.4 mm, and outlet width + 1.4 mm.
Conclusion: The new geometric shape of the ductus venosus between 10–13 weeks of gestation has a cylindrical and not a slender trumpet-like shape as defined previously in the literature.

P237
Reference values of Dopplerfluxometry of the Ductus Venosus at 10–14 weeks of gestation

F. H. C. Carvalho*, A. F. Moron*, R. Mattar*, C. G. V. Murta†, R. M. Santana*, F. A. P. Vasques* and L. Kulay*

Federal University of São Paulo – UNIFESP, Brazil and †Federal University of Espírito Santo, Brazil

Objective: The objective of this study is to establish reference values for Dopplerfluxometric parameters of the ductus venosus (DV), in the period from 10 to 14 weeks of gestation in relation to blood velocities during ventricular contraction (S wave), ventricular diastole (D wave), velocity between S and D waves (S-D velocity) and during atrial contraction (a wave) and of the angle-independent indexes.
Methods: This is a prospective transversal study on 276 single gestations. Multiple gestations, fetal malformation, fetuses with increased nuchal translucency (NT) and pregnant women with clinical pathologies were excluded of this study. The equipment used was Toshiba- model SSH-140 A. Levene's test was used to calculate variance homogeneity among the variables. The statistical study was performed by means of the variance analysis with multiple comparisons by the Bonferroni's method.
Results: S and D velocities presented a slightly increased pattern in relation to the studied gestational ages (descriptive level varying from 0.001 and 0.029), a wave, S-D velocity and all angle-independent indexes presented a constant pattern in the studied period.
Conclusion: The lack of important modifications in the ductus venosus flow velocity waveform is due to the fact that reduction in placental resistance and maturation in the ventricular diastolic function only occurs after this period. The values established by this study may be of help in the follow-up of normal gestations, diagnosis of fetal myocardial failure or screening for chromosomal disorders.

P238
There are no differences of Doppler indices between sheep fetuses with and without accelerated lung growth

M. Tchirikov*, J. Deprest†, H. J. Schröder* and K. Hecher‡

Universitätsklinikum Hamburg-Eppendorf, Germany; †Univ. Hospital Gasthuisberg, Leuven, Belgium and ‡AK Barmbek, Hamburg, Germany

Objective: To test the usefulness of Doppler indices in lung vessels to discriminate between normal and stimulated fetal lung growth.
Methods: In singleton sheep fetuses (gestational age 92–98 days) the trachea was ligated immediately caudal of the larynx (TO, n = 6). Blood flow velocities Vpeak, Vmin, TAMX and the pulsatility (PI) and resistance indices (RI) were determined (Acuson Aspen) in both pulmonary arteries (PAL: left; PAR: right), the pulmonary trunk (PT) and ductus arteriosus (DA) of these TO fetuses and in three controls (CTRL). These measurements were repeated weekly under slight sedation (xylazine im, 0.25 mg/kg). The animals were sacrificed at the end of the experiments, and body and lung weights were measured.
Results: Experiments lasted from 30 to 44 days (median 39) in CTRL and 21 to 37 days (median 22) in TO. Lung weights were 13.4% (7.6–19.3) in TO and 4.1% (3.2–4.9) in CTRL ($p < 0.03$) of body weight [mean (95%CI)]. Results from 19–22 observations in each group indicated that there were no significant differences between TO and CTRL for the Doppler indices. Vpeak, Vmin and TAMX were larger ($p < 0.05$) in DA than in PT > PAL or PAR. PI was larger in PAL or PAR than in PT and DA with no difference between DA and TP. However, RI in DA was smaller than in TP < PAL or PAR.
Conclusion: Though lung growth was stimulated by tracheal occlusion, blood flow velocities were not significantly affected. It appears unlikely that ultrasound Doppler can be useful to monitor lung development.

P239
Implanting a wide-bore stent into the ductus venosus of fetal sheep distinctly increases placental blood flow rate

M. Tchirikov and H. J. Schröder

Universitätsklinikum Hamburg-Eppendorf, Germany

Objective: To explore the effect of low ductus venosus (DV) resistance on umbilical vein (UV) (or placental) and hepatic blood flow rates.
Methods: In 9 sheep (118 [115–121] gestational days, mean [95% confidence interval]) with twinpregnancies stents (4–5 mm OD) were implanted into the ductus venosus of the experimental (exper) fetus, and arterial catheters were inserted into the right carotid artery of both fetuses (n = 6). One day (n = 9), 4 days (n = 7) and 8 days (n = 4) after surgery (postop) fetal arterial blood gas values were determined and blood flow rates in the intra-abdominal UV and in the isthmic portion of the DV of both the exper and control fetuses were measured using ultrasound Doppler technology (Acuson Aspen, General Electric Logique 9).
Results: One-way ANOVA did not yield significant differences between postop days, and data were pooled accordingly. There were no significant differences in blood gas values and fetal weights between control and exper fetuses. UV flow rate was larger in exper (694 [591–797] ml/min) than in control fetuses (481 [399–562] ml/min, $p = 0.002$, unpaired t-test) as was DV flow rate (exper: 392 [347–436] ml/min, control: 138 [116–160] ml/min, $p < 0.001$). In controls, 30.1 [23.8–36.4]% of UV flow passed through the DV whereas with stent the DV fraction was 59.2 [49.3–69.0]% ($p < 0.001$). Estimated hepatic flow rates (UV flow minus DV flow) were not different (exper: 317 [222–410] ml/min, control: 360 [267–453] ml/min).
Conclusion: Placental blood flow rate increases about 50% when resistance to flow in the DV is strongly reduced. The DV and hepatic resistances thus may control placental blood flow rate and consequently placental exchange.