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Role of decreasing maternal ingestion of polyphenol-rich foods on fetal ductus arteriosus dynamics in normal pregnancies: an open clinical trial.

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Basics and objective:
We have recently demonstrated that reversal of fetal ductal constriction occurs after dietary maternal restriction of polyphenol-rich foods (PRF), such as herbal teas, dark chocolate, grape and orange juices, olive oil, berries and others (J Perinatol, 2011). Other clinical and experimental evidences have already corroborated the association of maternal ingestion of PRF to fetal ductal alterations, due to interference on prostaglandin synthesis. This study tested the hypothesis that normal third trimester fetuses also improve ductus arteriosus dynamics after a polyphenol-poor diet for a period superior to 2 weeks.
Methods:
An open clinical trial was designed, in wich 46 fetuses with gestational age (GA) ≥ 28 weeks were submitted to 2 Doppler echocardiographic studies with an interval of at lest 2 weeks. Systolic and diastolic ductal velocities (SDV and DDV), pulsatility index (PI) and right to left ventricular dimensions ratio (RV/LV) were assessed. The examiners were blind to maternal dietary habits at the first examination. After the first study, a detailed food frequency questionnaire was applied and a diet based on polyphenol-poor foods (<30 mg polyphenols/100 mg) was reccomended. A control group of 26 third trimester fetuses in which no dietary intervention was offered was submitted to the same protocol. Statistical analysis used t test for independent samples.
Results:
Mean GA was 33±2weeks (28-38 weeks). Mean daily maternal estimated polyphenol intake was 1277mg. After dietary orientation, mean daily polyphenol consumption decreased to 126mg(p=0.0001). Comparing the 2 echocardiographic studies, significant decreases in SDV, DDV and RV/LV ratio, as well as increase in ductal PI were observed [DSV=1.2±0.4m/s (0.7–1.6) to 0.9±0.3m/s (0.6-1.3)(p=0.018); DDV=0.21±0.09m/s (0.15-0.32) to 0.18±0.06m/s (0.11-0.25)(p=0.016); RV/LV=1.3±0.2 (0.9–1.4) to 1.1±0.2 (0.8-1.3)(p=0.004); ductal PI=2.2±0.03 (2.0 – 2.7) to 2.4 ± 0.4 (2.2–2.9)(p=0.04)]. In the control group, with GA of 32±4weeks (29-37 weeks), there were no significant differences in mean daily maternal ingestion of PRF, mean SDV, DDV, PI and RV/LV ratio after a period of 2 weeks.
Conclusion:
The oriented restriction of third trimester maternal ingestion of polyphenol-rich foods for a period of 2 weeks or more improve fetal ductus arteriosus flow dynamics and right ventricular dimensions.