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Doppler assessment of the fetal aortic isthmus in Peruvian pregnant women

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Introduction: Intrauterine Growth Restriction (IUGR) is an important complication of the pregnancy because of its association to a significant risk of perinatal morbidity and mortality. Since the majority of IUGR cases are due to placental dysfunction, the gold standard test that used to differentiate them from the constitutionally small fetuses was the doppler assessment of the umbilical artery; nevertheless, current evidence demonstrates that there are two different IUGR groups regarding clinical diagnosis and management: The early IUGR (onset <34 weeks) and the late IUGR (onset >34 weeks). Early onset IUGR is easily diagnosed but hardly managed. On the other hand, late onset IUGR is hardly diagnosed but easily managed; so when the doppler assessment of the umbilical artery is not conclusive either for the management (early IUGR) or for the diagnosis (late IUGR), the Doppler study of the fetal aortic isthmus (AI) is relevant for identification and management of both cases.

Objective: To determine Doppler velocimetry, pulsatility index and end-diastolic flow of the fetal aortic isthmus, validating and establishing normality curves in pregnant women seen in the National Institute of Maternal and Perinatal Health (INMP) of Lima, Peru.

Methodology: The current study, which is mainly observational, pretends to have a first approach on the description of the fetal aortic isthmus Doppler. A representative sample of 258 pregnant women seen in the INMP from January 2013 until June 2013, and between 28 and 37 gestational weeks were chosen for the study. We analyzed maternal clinic history in the sample trying to identify characteristics or presence of the variables of the study (early and late onset IUGR) and their relationship to the fetal aortic isthmus Doppler (obtained transabdominally in either of the two planes of acquisition, transverse or longitudinal views).

Results: A total of 258 pregnant women were included in the study: Around 20 and 30 cases for each week of gestation between 28 and 37 weeks of pregnancy. The mean value of the pulsatility index (PI) of the fetal AI in the whole sample was 2,7562 with a correction factor of 0.02 for each week of the gestational age. We defined as pathological values of the PI (regarding early and late onset IUGR), those over the 95th centile for the gestational age, at the same time that we considered a positive (anterograde) end-diastolic flow of the fetal AI as normal; and a negative (retrograde) end-diastolic flow as pathological.

Conclusions: The current study demonstrates that throughout the whole pregnancy there is a progressive increase in the Doppler velocities in the fetal aortic isthmus. This positive correlation with the gestational age is probably as a consequence of the physiological increase of the fetal cardiac output and the total blood flow that goes across the aortic isthmus. We took into account the recommended criteria by ISUOG for the elaboration of the normality curves. Indeed, one important contribution of our study has been, precisely, this first approach validating and establishing normal values of the pulsatility index of the fetal aortic isthmus in Peruvian pregnant women; values that are really important to establish reference parameters for their use and implementation in clinical daily practice in the hemodynamic control of IUGR fetuses.

Biography

Enrique Gil Guevara has completed his Specialization in Obstetrics and Gynecology in the National Institute for Maternal and Perinatal Health of Lima, Peru. He has presented several papers in different World Congresses of Fetal Medicine; and currently he is doing a Research Fellowship in Fetal Medicine at King's College Hospital in London, UK.

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