

Uterine Artery Doppler in Prediction of Pre-eclampsia & Intrauterine Growth Retardation

Essay

**Submitted for Partial Fulfillment of
Master Degree in Obstetrics and Gynecology**

By

Yahia Zakaria Abdel Alim Ali

(M.B.B.Ch.)

Supervised By

Prof. Dr. Omar Abdel Aziz Mohammad

Prof. of Obstetrics and Gynecology

Faculty of Medicine

Cairo University

**Prof. Dr. Wael Mohammad Rashad
Assist. Prof. of Obstetrics and Gynecology**

Faculty of Medicine

Cairo University

**Dr. Sahar M.Y. Elbaradie
Lecturer of Obstetrics and Gynecology**

Faculty of Medicine

Cairo University

Faculty of Medicine

Cairo University

2005

Summary

Doppler ultrasound was introduced into the field of medicine about 40 years ago. The types of Doppler ultrasound present now are: continuous wave Doppler, pulsed wave Doppler, color flow imaging, power flow Doppler. The choice of the transducer used in scanning should fit for application required, and for the patient. Doppler has many obstetric applications of which: fetal physiology, intrauterine growth retardation, fetal echocardiography, and others.

Maternal uteroplacental blood flow increases during pregnancy. Altered uteroplacental blood flow is a core predictor of abnormal pregnancy. Normally, the uteroplacental arteries are invaded by endovascular trophoblast and remodeled into dilated, inelastic tubes without maternal vasomotor control. Disturbed remodeling is associated with maintenance of high uteroplacental vascular resistance and intrauterine growth restriction (IUGR) and preeclampsia.

Impaired trophoblast invasion may be due to: Extravillous trophoblast synthesis of nitric oxide that is related to arterial dilation that paves the way for endovascular trophoblast. Moreover, molecular mimicry of invading trophoblast-expressing endothelial adhesion molecules that is related to replacement of endothelium by trophoblast. Also, maternal uterine endothelial cells actively prepare endovascular invasion by expression of selectins that enable trophoblast to adhere to maternal endothelium. Finally, the mother can prevent endovascular invasion by activated macrophage-induced apoptosis of trophoblast.

Several Doppler screening studies, both in the second and more recently in the first trimester of pregnancy, have demonstrated an association between increased impedance to flow in the uterine arteries and subsequent development of pre-eclampsia, IUGR.

This increased impedance identifies about 40% of those that subsequently develop pre-eclampsia and about 20% of those that develop IUGR. And abnormal Doppler is better in predicting severe disease.