

# Uterine artery Doppler ultrasonography in the first and second trimester for prediction of preeclampsia: Implications for Pakistan

Madam, Preeclampsia, which affects 2%-5% of pregnancies world-wide, is a major cause of maternal and perinatal morbidity and mortality.<sup>1</sup> In Pakistan, it is the second most common cause of maternal death preceded only by haemorrhage.<sup>2</sup> In a recent study on stillbirths in an urban community in Pakistan, 13% of the stillbirths were directly associated with preeclampsia.<sup>3</sup> The pathophysiology of this condition is due to abnormal placenta formation involving defective trophoblastic invasion of spiral arteries and increased impedance to flow in the uteroplacental circulation resulting in vascular insufficiency. Accurate prediction is hence critical to providing adequate antenatal care and therapy in order to improve perinatal outcomes.

The uteroplacental circulation can be assessed by Doppler ultrasonography of the uterine arteries. This technique has the potential value to identify pregnancies at risk for preeclampsia. The blood vessel is identified with the use of colour Doppler and pulsed-wave Doppler is subsequently used to obtain waveforms (Figure-a). Resistance index, pulsatility index and the presence or absence of an early diastolic notch in the waveform can be assessed and calculated for predicting the level of risk for preeclampsia (Figure-b).

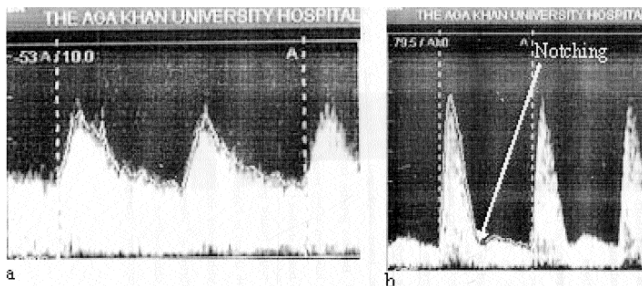


Figure: a) Uterine artery Doppler ultrasound showing normal waveform; b) Uterine artery Doppler ultrasound showing early diastolic notch (arrow). The presence of diastolic notches is associated with an increased risk of preeclampsia.

We have introduced uterine artery Doppler assessment at our hospital, for the prediction of

preeclampsia in both the low and high-risk pregnancies. The combination of uterine artery Doppler screening with maternal history improves the detection rate of preeclampsia requiring delivery before 34 weeks to 80% for a false positive rate of 10% as opposed to a 30% detection rate of preeclampsia by screening from maternal history alone.<sup>4</sup> As the women are referred to us for routine ultrasound pregnancy assessment, it is easy to perform Doppler studies at the same time which is non-invasive, takes an additional 2-5 minutes, does not entail extra cost and the technique is generally acceptable to the patients. There are perhaps apprehensions associated with being labeled as at-risk for preeclampsia. However, the uterine artery Doppler assessment forms the basis to design a plan for antenatal care of women. It would allow clinicians to make rational choices in directing the use and frequency of foetal and maternal monitoring resources and the possibility of low-dose aspirin therapy which is inexpensive and readily available, from which these women may benefit.<sup>5</sup> We therefore recommend this technique to be considered in routine antenatal care in Pakistan and expertise should be developed for it to be implemented in routine obstetric ultrasound practice.

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