Performance of current screening tools in the second trimester, using Uterine Artery Dopplers to predict placental disease
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Introduction
The development of the uteroplacental circulation is one of the most important physiological changes that occurs during pregnancy. Defects in this developmental process can lead to placental diseases such as pre-eclampsia (PET), Intrauterine growth restriction (IUGR), placental abruption and intra-uterine death (IUD).

Currently, the Royal College of Obstetricians and Gynaecologists (RCOG) recommend measuring Uterine Artery Dopplers between 20 and 24 weeks gestation for pregnancies deemed to be at high risk of placental disease.

The current indications for performing Uterine Artery Doppler studies at St Thomas’ Hospital include previous placental disease and gestational diabetes. A raised mean pulsatility index (mPI) above 1.4 on transabdominal scan between 18-22 weeks is considered clinically significant. All patients with a raised mPI will have further growth scans at 26 and 34 weeks gestation, in addition to being regularly reviewed in antenatal clinic.

Results
633 women underwent anomaly scan between 18-22 weeks gestation in July 2013. Flowchart 1 shows the number of women who had doppler studies performed.

Table 1 shows the incidence of placental disease is 8% in those considered low risk and who did not undergo Uterine Artery Doppler studies versus 21% in those who were considered high risk of developing Uteroplacental disease. Uterine Artery Doppler studies only detected 25% of these cases even in the high risk group.

Table 2 shows the breakdown of placental disease by mPI. Using a lower mPI cut-off of 1.2 increases the sensitivity of the test from 25% to 44%. However, the positive predictive value is lower when using a mPI of 1.2, suggesting that we may over treat those that are well.

Discussion
13% of our population underwent screening with Uterine Artery Dopplers between 18 and 22 weeks gestation. The incidence of placental disease is approximately 10% (8% in low risk vs. 21% in high risk). A significant proportion of placental disease (70%) occurs in the group considered ‘low risk’ at booking. However, the current screening tool using the second trimester Uterine Artery Doppler is not useful even in women identified as high risk at booking. The usefulness of doppler studies in women who are low risk is uncertain. Using a lower cut off for mPI may increase the sensitivity at the expense of increasing the false positive rate, with subsequent consequences on resources and maternal anxiety.

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