Aim

- To determine whether there were any differences in the early ultrasound appearances of pregnancies that continued to be viable or resulted in miscarriage before 12 weeks gestation.

Methods

- Prospective cohort study including ultrasound measurements: mean sac diameter (MSD), yolk sac diameter (YSD), crown-rump length, fetal heart rate (FHR), trophoblast thickness, trophoblast volume (TV) and mean uterine artery pulsatility index (meanUAPI).
- Regression models were fitted for each parameter and Z-scores compared between cohorts that progressed or miscarried after the scan but before 12 weeks gestation.
- Logistic regression analysis was used to create a prediction model for miscarriage prior to 12 weeks gestation based on the standardised ultrasound measurements recorded during the early first trimester scan.

Results

- Comparison of Z-Scores for meanUAPI, trophoblast volume, and FHR demonstrated significant variation between the two groups.
- The proposed logistic regression model (Z-scores for MSD, YSD, FHR, TV and meanUAPI) resulted in an AUC of 0.81 (95%CI 0.74-0.87)
- At a false positive rate of 30% the model resulted in a sensitivity of 76% (95%CI 64-89%); NPV: 96.1%.

Conclusion

This study is the first to show a significant reduction in the mean UAPI in early pregnancy in those destined for miscarriage. In combination with other ultrasound parameters may be useful in counselling and guiding the short-term management of early pregnancies.