Assessment of the fetal kidneys during the first trimester scan

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Objective
The aim of the study was to assess the feasibility of fetal kidneys imaging during the routine 11-13+6 week ultrasound (US) examination in a low-risk population.

Methods
A prospective study including 209 women with singleton pregnancies at 11-13+6 weeks of gestation was conducted to assess the routine feasibility of kidneys imaging at this stage. Transabdominal (TA) or/and transvaginal (TV) ultrasound (US) examination was performed. The fetal kidneys were assessed during the TA scan by grey scale US and, if the kidneys were not visualized clearly, Doppler US was used to visualize the renal arteries. If fetal kidneys could not be seen by TA US then TV was performed. Fetal bladder was evaluated either transabdominally or transvaginally in all of the cases.

Results
The fetal kidneys were successfully visualized in 203 (97.1%) fetuses using a combination of TA and TV approach. One of the patients in whom the fetal kidneys were not visualized transabdominally refused the TV scan. Fetal kidneys were visualized with grey scale US transabdominally in 125 patients (61.5%), with TA Doppler US in another 6 (3%), and with TV US in 35.5% of the patients. The use of the TV approach increased successful examination of the fetal kidneys from 64.5% to 97.1%. When the fetuses were divided into two groups according to the crown-rump length (CRL) with Group 1 including fetuses with a CRL of 45-64 mm and Group 2 including fetuses with a CRL of 65-82 mm, there were no statistical differences between the groups in the visualization rates of fetal kidneys either by TA or TV US. There was one case of unilateral (left) renal agenesis diagnosed during the first trimester scan and then confirmed later during the second trimester anomaly scan and postnatally. The bladder was seen and neither of the kidneys/renal arteries could be visualized transabdominally whereas only the right kidney was seen transvaginally during the first trimester scan.

Conclusion
Successful visualization of fetal kidneys is feasible in most of the patients using a combined TA and TV approach during the first trimester with the current high resolution equipment and should be included in the checklist for assessment of fetal anatomy.