Objective
To compare first and second-trimester placental structure and blood flow in pregnancies achieved through donated oocytes compared (ODP) with age-matched women who conceived by assisted reproduction using autologous oocytes (AP).

Material and methods
This prospective case-control study included 47 ODP and 47 AP that were individually matched by maternal age (± 1 year) and gestational week at examination (± 1 week). Women with fetal chromosomal abnormalities, fetal malformations, placental anomalies, umbilical abnormalities, complications associated with pregnancy, systemic vascular or autoimmune disorders were excluded from the study.

Ultrasoundographies were performed at 11±0.13±6 (visit 1) and 19±0.21±6 weeks (visit 2); the structure and vascularization indices of the placenta were assessed.

The following indices were measured:
- vascularization index (VI), ratio of voxels to all voxels within the placenta (%; number of vessels);
- flow index (FI), mean power Doppler signal intensity from all color voxels (intensity of flow);
- vascularization flow index (VFI), the weighted color voxel-to-total voxel ratio.

Results
The two groups had similar demographic characteristics (age, parity, age, ethnicity, BMI, smoking status). The parameters of placenta of both groups are reported in the Table 1.

- Placental volume at visit 1 and visit 2 showed no significant differences between ODP and AP;
- placental calcification at visit 1 and visit 2 showed no significant differences between ODP and AP;
- placental lakes were similar in the two groups at visit 1, but at visit 2 they were more prominent in ODP than in AP.

In the first trimester of pregnancy, VI, FI and VFI were significantly lower in the ODP group than in the AP group. In the second trimester, FI was lower in ODP than in AP.

Conclusions
Placental vascularization indices are decreased in ODP compared with AP, particularly in the first trimester of pregnancy. These observations may reflect the underlying etiology of impaired placentation in ODP.

Table 1. Structure and vascularization indices of the AP and ODP groups