Objective: The aim of our study was to evaluate the predictive value of quantification of placental and myometrium vascularisation during the first trimester using 3D power Doppler for placental vascular diseases in high risk population.

Materials and Methods: Acquisition of utero-placental volume was performed prospectively in 60 high risk patients, between 11 and 14 weeks, using an abdominal probe and 3D power Doppler (3D PD) angiography with standardised parameters. Thanks to VOCAL software, we quantified separately, placental and myometrial vascularization. Values obtained from patients with PVD were compared with those with favourable outcome.

Results: PVD occurred in 15 cases (13 IUGR of which 3 with associated preeclampsia, 2 gestational hypertension). Any significant differences were found for placental indices or volumes. But regarding myometrium, all 3D PD indices (VI, FI and VFI) significantly decreased in patients who developed PVD (p<0.01) {mean VI: 11.09 vs 21.71; VFI: 4.39 vs 10.92 and FI 44.58 vs 49.15}.

Conclusion: This technique could be a way to detect patients who really have an increased risk of PVD in population classically considered to be at high risk and to select patients for preventive treatment and increased medical monitoring.