P13.08 Changes in endothelial glycocalyx during pregnancy as a marker for uteroplacental adaptation: a longitudinal pilot study
F. Meijs1, A. Bruekers1, V. Schiffer1,2, S. Al Nasiry1,2

Background
The endothelial glycocalyx is involved in vascular homeostasis and presumably plays an important role in microvascular pregnancy adaptations. Glycocalyx measurements during pregnancy may identify uteroplacental maladaptation.

Aim: To assess longitudinal changes in the sublingual endothelial glycocalyx during pregnancy in women with sufficient or insufficient uteroplacental adaptation.

Methods
Prospective cohort: Pregnancies with sufficient (n=48) versus insufficient (n=12) uteroplacental adaptation (pulsatility index > 95th percentile or bilateral notch of the uterine artery (UtA) at 20 weeks of gestation).
Exclusion criteria: Twin pregnancy, miscarriage or abortion, not enough valid measurements.
Statistical analysis: Paired t-test, Wilcoxon signed rank-test, linear and logistic regression, using IBM SPSS Statistics 25.
Measurement: Non-invasive sidestream dark-field (SDF) imaging technique (GlycoCheck) measuring the Perfused Boundary Region (PBR), with a high PBR indicating a thinner glycocalyx layer. Measurements at 12, 16, 20 and 30 weeks of gestation.

Results
In sufficiently adapting pregnancies, PBR increased significantly between 12 and 16 weeks (0.18 ± 0.36, p<0.001), while the insufficient adapting group showed a significant increase in PBR between 12 and 20 weeks (0.29 ± 0.35, p=0.03), and between 12 and 30 weeks (0.24 ± 0.22, p=0.02) (Figure 2).
In a linear regression model, PBR at 20 weeks was a medium predictor for the mean UtA PI (R²=0.38 (-0.01, 0.76), p=0.06).
In logistic regression, PBR at 20 weeks was a predictor for maladaptation (OR=1.29 (0.99-1.67), p=0.051) as well as mean arterial pressure (OR=1.06 (0.95-1.19), p=0.32) and haemoglobin levels (OR=1.85 (0.40-8.57), p=0.43). However, these findings were not significant.

Conclusion
Endothelial glycocalyx damage increases during pregnancy and seems to be more pronounced in insufficiently adapting pregnancies. PBR, as a marker of glycocalyx damage, is a possible predictor of mean uterine artery pulsatility index and therefore could play a role in detecting vascular maladaptation at an early gestational age.

Figure 1. Microscopic view of a healthy endothelial glycocalyx (left) and a damaged glycocalyx (right).
Figure 2. Significance (at less than p=0.05 (*)) compared to the corresponding group at 12 weeks pregnancy in the total, sufficient adapting and insufficient adapting group.