Objective
To study the hemodynamic effects of antenatal corticosteroids (AS) for fetal lung maturation in Growth Restricted (GR) and Appropriate for Gestational Age (AGA) fetuses.

Methods
Prospective cohort study conducted at two tertiary hospital (University Medical College of Groningen -UMCG- and Azienda Ospedaliero-Universitaria Careggi -AOUC) between December 2014 and February 2016. Singleton AGA and GR fetuses undergoing AS for medical indication between 24+0 and 33+6 weeks were enrolled. Fetal vascular parameters (Umbilical Artery-UA, Middle Cerebral Artery-MCA, Ductus Venosus-DV, Renal Artery -RenA) and cardiac function were assessed before AS administration ("baseline examination"-E0), 24-48 hours (E1) and 7 days after the second dose of steroids (E2). Fetal cardiac function was evaluated through left and right myocardial performance index (MPI), E wave-A wave ratios (E/A), Mitral and Tricuspid Annular Plane Systolic Excursion (MAPSE and TAPSE). Data were normalized for gestational age and were analysed for each fetus and compared before, during and after treatment using pairwise comparisons with paired t test with Holm's correction.

Results
25 AGA and 18 GR fetuses were included. The 2 groups didn’t differ significantly for gestational age at enrolment (29+5-30+0 weeks respectively- p 0. 87) and maternal characteristics (p 0. 15). Our results show a transient significant decrease in UA PI both in the AGA and GR group (E0-E1: p 0. 021 and 0. 017, respectively) after AS exposure. This effect disappeared at the third examination (E0-E2: p 0. 25 and 0. 37, respectively). With regard to cardiac function MPI right increased significantly in the GR fetuses, this effect seems to persist up until one week after AS administration (E0-E1: p 0. 049, E0-E2: p 0. 049).

Conclusion
Corticosteroids caused a peripheral vasodilation in both AGA and GR fetuses and increased right MPI in the latter group, therefore seemingly worsening cardiac function in these fetuses. Further studies with bigger sample size are needed to deepen our knowledge about effects of AS in GR fetuses.