P01.05 Low fetal fraction in NIPT: aneuploidy and adverse pregnancy outcome

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Objectives
Low fetal fraction (LFF) of cell-free DNA in non-invasive prenatal testing (NIPT) is associated with an increased risk of aneuploidy. It might reflect early abnormal placentation and also be associated with adverse pregnancy outcome. This study reviews the literature on the relationship between LFF and adverse pregnancy outcome in NIPT.

Methods
A literature search of articles published until May 2019 in PubMed was performed. RCT’s, cohort studies and case-control studies screening for trisomy 13, 18, and 21 on an NGS platform were included if the fetal fraction was reported as ‘low’ or below a cut-off of 4% and the result of the NIPT was confirmed with invasive testing or the postnatal phenotype and/or the clinical outcome of the pregnancy was reported for adverse events. Only studies with singleton pregnancies and >100 subjects were eligible.

Results
Our search yielded 606 articles. Ten articles were included for review. Prevalence of aneuploidy ranged from 0-33.3%, with triploidy found in 7 out of 22 cases of aneuploidy. Four studies found a significant association with adverse pregnancy outcome, such as small for gestational age (SGA), hypertensive disorders of pregnancy (HDP), gestational diabetes mellitus (GDM), and preterm birth (PTB).

Conclusion
LFF is associated with aneuploidy and likely associated with adverse pregnancy outcome. Given the scarcity of evidence, we recommend a large prospective cohort study on the relationship between fetal fraction and adverse pregnancy outcome.