**TRIO ANALYSIS IN PREGNANCY LOSS**

Aneuploidies are the well-known reason for most of the spontaneous fetal losses in early pregnancy.
In a genomic study of early pregnancy loss, Annadottir et al.[1] compared the parental genomes to the that of the aborted fetus in 467 cases. This trio-based whole-genome sequencing showed a high proportion of aneuploidies (206 fetal losses) and triploidies (14 losses). Via the parental genome sequences the authors were able to determine in which parent the genetic error occurred. As expected, 80 percent of the aneuploidies were due to maternal meiotic error (mostly MI). Almost 7 percent of these maternal events occurred before sister chromatid formation in fetal oocytes. Triploidies were of paternal origin in 11 cases due to dispermy and in 19 cases of maternal orgin (mostly by meiotic error). In addition, several cases of large duplications or deletions were found. Compared to adult trios, there was a threefold enrichment of pathogenic small sequence variants (SSVs) in trios of pregnancy loss. The authors suggest that this indicates SSVs are causative in about two thirds of euploid losses. Although this new research approach may not be suitable at present for routine clinical diagnostics, it does allow identification of essential genes and their function in early fetal development. The editorial in Nature by Gao[2] gives a handy overview of the different genetic causes of early pregnancy loss. One has to bear in mind, as this editorial points out, that fetal development depends not only on the fetus's own genetic viability but also on several other factors, for example, the maternal genetic variation and the interplay between maternal and fetal genotypes.

[1] https://doi.org/10.1038/s41586-025-09031-w

[2] https://doi.org/10.1038/d41586-025-01706-8