

Pregnancy outcome of confined placental mosaicism: meta-analysis of cohort studies

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Objective

To assess the rate of adverse obstetric and neonatal outcomes in pregnancies prenatally diagnosed with confined placental mosaicism as compared to unaffected controls.

Methods

Databases were searched using relevant keywords and retrieved articles published from 1980 to 2022. Observational cohort studies in English language including at least 10 cases of singleton pregnancies with prenatal diagnosis of confined placental mosaicism were included. The diagnosis was established after detection of any chromosomal abnormality at chorionic villous sampling for any indication, followed by normal karyotype from amniotic fluid or neonatal leukocytes culture. References were screened for eligibility and data extraction with assessment of methodological quality using the Newcastle-Ottawa scale was carried out. All available obstetric and neonatal outcomes were recorded. Random-effect meta-analysis was performed to estimate pooled odds ratios and 95% confidence intervals of available outcomes in pregnancies with and without confined placental mosaicism. Statistical heterogeneity was evaluated with I² statistics. The study protocol was registered on PROSPERO (CRD42021260319).

Results

Articles reviewed were 80, of which 8 retrospective matched cohort studies (708 cases of confined placental mosaicism and 11599 unaffected controls) compared cases with and without confined placental mosaicism and were included in the meta-analysis. The risk of delivering small for gestational age neonates was significantly increased in confined placental mosaicism pregnancies according to crude analysis (OR: 2.45, 95%CI: 1.23-4.89, I² = 72%) and to sensitivity analysis of high-quality studies (OR: 3.65, 95% confidence interval 2.43-5.57, I² = 0%). Similarly, confined placental mosaicism resulted in an increased risk of birthweight <3rd centile (OR: 5.33, 95%CI: 1.19-24.19, I² = 83%). Subgroup analysis revealed that the risk of delivering small for gestational age neonates was 3-fold higher for confined placental mosaicism excluding trisomy 16, and 11-fold higher for cases including trisomy 16 only vs. unaffected controls, respectively. No difference was found in the risk of low birthweight and preterm birth (<37 weeks' gestation). No other outcome was available for analysis.

Conclusion

Pregnant women prenatally diagnosed with confined placental mosaicism have an increased risk for impaired fetal growth, particularly (but not only) when trisomy 16 is diagnosed. This finding suggests that the condition may be an etiologic precursor of placental dysfunction and consequently intensified antenatal surveillance should be indicated. Insufficient reporting of obstetric outcomes associated with confined placental mosaicism was also observed.