

Effects of prenatal alcohol exposure on placenta structure in fetal MRI



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Objective

This study aimed to provide initial insights in structural placental anomalies following prenatal alcohol exposure (PAE).

Methods

This retrospective study investigated 29 fetuses (mean gestational age 26.1 weeks, SD 3.7 weeks) subjected to PAE (PAE+) without confounding comorbidities and 29 age-matched controls without PAE (PAE-). Assessment of the placenta was performed using 1.5 and 3 T fetal MRI imaging data and included analysis of twelve structural parameters. Assessment was conducted based on T1-, T2-, and EPI/T2*-weighted imaging.

Results

This study provides initial data on structural placental anomalies in vivo fetal MRI following PAE. An association of PAE with increased occurrence rates of placental lobulation, venous congestion, any type of placental hematoma, subamniotic hematoma on the placental surface, specifically, and hypercoiled umbilical cord was detected. A trend was observed with increased placental lobulation occurring at earlier gestational ages in PAE+ fetuses. Overall, more structural placental

anomalies were detected in women with PAE compared to unexposed controls despite a relatively low amount of alcohol consumption (1-3 drinks per week) within the exposed group.

Conclusion

Early detection of PAE is essential considering the potentially detrimental effects of ethanol on placental structure. Fetal MRI provides a complementary tool to ultrasound to assess the placenta. Early detection of structural placental anomalies may aid counselling physicians in choosing appropriate pregnancy management plans.

Figure

a, b: Normal placenta. c, d: Normal and increased placental thickness. e: Globoid placenta shape. f: Hypoplastic placenta. g: Asterix indicating an excentric insertion of the umbilical cord. h, i: Hypercoiled umbilical cord. j-o: Venous congestion of the placenta. p, q: Thrombosis of the placenta. r: Placental edema. Presence of edema does not allow for assessment of lobulation. s-x: Placental hematoma. y, z: Placental lobules (and diffuse venous congestion) in the lower placenta in twin pregnancy. Edematous placenta of the second twin on top. A, B: Placental infarction.

