17th World Congress in Fetal Medicine

A placental histopathological changes in the growth-restricted fetus and consequent neonatal outcomes

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Objective

Placental insufficiency is the most common cause of fetal growth restriction (FGR). We compared macroscopic and histologic findings of placental evaluation in FGR and control groups and we assessed the correlation between placental histologic changes and neonatal outcomes.

Methods

A retrospective study was performed in 70 singleton pregnancies with fetal growth restriction (FGR) and 39 controls delivered at Busan Paik hospital, from Jan 2017 until Dec 2017. Between the two groups we analysed the macroscopic differences and histologic lesions of the placenta, classified as placental underperfusion and chronic inflammation. In the FGR group we analysed the association between placental histopathologic factors and pregnancy outcome.

Results

Comparing the gross findings of the placenta, FGR group had lower placental weight (345. 94±116. 53gm vs 477. 72±118. 44 gm, P <. 0001), thinner placental thickness (2. 5cm〔2. 2-2. 7 vs 3. 0cm〔2. 5-3. 0〕, P=. 0223), smaller chorionic plate diameters (147. 65 cm2〔137. 96-157. 58 vs 192. 42 cm2〔175. 92-224. 68〕, P<. 0001) compared with control group. Also, placental infarction was more frequent in the FGR group (54. 3% vs 23. 1%, P=. 0017). The results of pathologic examination showed that FGR group had higher rate of maternal underperfusion (81. 4% vs 59. 0%, P=. 0114) and chronic inflammatory lesions (81. 4% vs 56. 4%, P=0. 0053) than control group and in most of the cases FGR is associated with placental uderperfusion as a possible underlying cause (82. 5% vs 53. 8%, P=. 0277). Maternal underperfusion might be used as a predictor factor of FGR (adjusted odds ratio〔95% CI〕6. 7〔1. 89-24. 1〕, P=. 0032). FGR neonates had higher rates of NICU admission (77. 1% vs 35. 9%, P<. 0001) and sepsis (45. 7% vs 15. 4%, P=. 0015) compared to control group.

Conclusion

The prevalence of placental lesions consistent with maternal underperfusion was higher in pregnancies complicated with FGR than in the placentas of patients in the control group. Despite the small number of cases we found useful for a better understanding of the process involved in placental insufficiency to assess the histologic changes of the placenta in pregnancies complicated with FGR and to evaluate the impact of these changes in the pregnancy outcome.