

The analysis of the antioxidant system in patients with placental dysfunction

5. Complications and cases gone wrong

Dmytro Konkov¹, *Iryna Borzenko*², *Nazar Adamchuk*³

¹ National Pirogov Memorial Medical University, Vinnytsya, Ukraine

² Kharkiv National Medical University, Kharkiv, Ukraine

³ Danylo Halytsky Lviv National Medical University, Lviv, Ukraine

Objective

The most frequent etiology for late onset intrauterine fetal growth restriction (IUGR) is placental dysfunction (PD) which is due to inadequate hemodynamic supply to support normal growth of the fetus. The delicate balance of oxidative control by antioxidant proteins is crucial to the healthy progression of pregnancy and disequilibria in compensatory antioxidant control are proposed as a causative mechanism in the pathophysiology of PD.

Study design

Our comparative case-control study was conducted 20 patients had laboratory form of PD, and 20 patients had IUGR, and 20 healthy pregnant women in 25-28 weeks of gestation. We were investigated serum levels of superoxide dismutase [SOD] and catalase.

Results

The obtained results indicated a significant ($p < 0.05$) decrease in catalase indices in patients with PD and IUGR up to 0.11 ± 0.04 CU/L relative to similar indicators presented in women with a physiological pregnancy (0.28 ± 0.05 CU/L). However, the indicators of catalase activity did not have significant differences ($p > 0.05$) in women with PD without IUGR, as compared with the results obtained in healthy pregnant women (0.17 ± 0.04 CU/L). Serum levels of SOD in patients with PD indicated a significant decrease in the antioxidant defense system due to the toxic effects of reactive oxygen species. In pregnant women with IUGR, the serum concentration of SOD was reduced almost 2.5 times to 0.15 ± 0.05 CU/L compared with women who had physiological pregnancy - 0.35 ± 0.05 CU/L ($P < 0.05$). SOD in women with laboratory PD - 0.25 ± 0.04 CU/L hadn't confirmed significance ($p > 0.05$) compared with the result in healthy pregnant women.

Conclusions

The decreased endogenous activity of key antioxidant enzymes leads to augmentation of the oxidative stress produced as a consequence of hypoxia reoxygenation within the placenta and may contribute to the increased probability of the IUGR.