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Placental histopathology in preeclampsia and outcome of the offspring

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Abstract

Preeclampsia (PE) is a major cause of maternal and fetal morbidity and mortality. The maternal symptoms are diverse and the neonates are often born premature and growth-restricted. Today the survival of premature infants has increased, but the neonatal complications including morbidity and long-term developmental deficits are still common.

The etiology and pathophysiological mechanisms in PE are still not known, but it seems as if a central part of the pathogenesis is associated with an unsuccessful implantation of the placenta into the uterus. The only cure is to deliver the mother, which is often a difficult decision in regard to prematurity of the fetus, when the disease has begun early in pregnancy.

In our first and second studies, we examined the placental pathology in relation to the maternal symptoms and severity of disease. The first study showed that there was a correlation between the severity of symptoms and the placental pathology. Further, the pathological picture was similar in mild and severe PE, but differed in relation to controls. To summarize, mild PE seems to be part of the PE spectrum, and not a normal physiological development of pregnancy, in contrast to what has previously been claimed.

The second study showed that placental pathology differed in severe PE with and without HELLP syndrome (hemolysis, elevated liver enzymes and low platelets), which is a disease regarded as a PE subtype, although the clinical picture is different from classical PE. This indicates that other mechanisms might be involved in the HELLP syndrome.

In the third and fourth studies, we examined the placental pathology in relation to perinatal, neonatal and childhood outcome. In the third study, we investigated the relation between placental pathology and perinatal and neonatal outcome in a cohort of PE patients and found that placental pathology was associated with adverse outcome. In the fourth study, in which we studied infants born extremely premature, we also found correlations between placental pathology and perinatal and neonatal outcome.

In the fourth study, we also explored possible relations between placental pathology and neurologic and developmental outcome of the child at the age of 2,5 years. We found a significant association between placental infarction and cerebral palsy (CP), and tendencies between several pathological findings and developmental outcome.

Overall, we have shown that the underlying pathologies in mild and severe PE probably are similar, whereas HELLP syndrome might have a different etiology. In addition, we have found associations between placental pathology and outcome of the offspring.

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