Serial non-invasive blood pressure measurements in neonates of mothers with early-onset preeclampsia: a case control study

Karatza A.A., Papadopoulou C., Panagiotopoulou O., Skaltsa N., Kolovou V., Dimitriou G.
Department of Paediatrics, Neonatal Intensive Care Unit University of Patras Medical School, Patras, Greece

Introduction: Preeclampsia is associated with increased long-term risk of hypertension and cardiovascular disease in the mother and child. Early onset preeclampsia is considered to be a consequence of fetal disorder, has distinct cardiac and vascular characteristics and may thus represent a separate disease entity. Early onset preeclampsia is diagnosed before 34 weeks of gestation and carries the greatest risk of long-term cardiovascular sequelae. However, there is paucity of data concerning blood pressure (BP) values in the offspring during the neonatal period.

Methods: BP was measured with an oscillometric monitor at birth, daily during the first week of life and then weekly up to discharge from the Neonatal Unit in 68 neonates of mothers with early-onset preeclampsia and in 68 neonates of normotensive mothers matched for gender, gestational age and twinning.

Results: The two groups did not differ regarding maternal smoking status, diabetes or antenatal corticosteroid exposure, whereas offspring of mothers with early-onset preeclampsia had lower mean birth weight SDS-scores (-0.78±0.77 versus -0.32±0.86, p=0.001). Repeated measures ANOVA showed that both early onset preeclampsia and postnatal age, as expected, had a significant effect on systolic and diastolic BP during the first 4 weeks of life after adjusting for birth weight SDS-score (p=0.003 and p<0.0001, respectively). Paired comparisons showed no difference between the groups in systolic and diastolic BP at birth and the 1st day of life, whereas neonates of preeclamptic mothers had higher systolic and diastolic BP values at all other time points that BP was measured.

Conclusion: Our findings are in line with other studies that have reported a positive association between hypertensive disorders of pregnancy and offspring BP. We demonstrated that neonates whose mothers developed early onset preeclampsia have increased BP values and documented that these differences are detectable since the first days of life, prior to exposure to postnatal environmental factors that are likely to influence BP. The lack of difference in BP measurements during the first 24 hours of age may be attributed to the adaptation process to extrauterine life or maternal medication exposure.