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Osteoprotegerin and RANKL serum concentrations in neonates of mothers with early-onset pre-eclampsia: comparison with preterm and term appropriate for gestational age neonates of normotensive mothers

Karatza A.A., Oikonomou N., Papadopoulou C., Fouzas S, Kritikou D., Chrysis D., Sinopidis X.
Department of Paediatrics, Neonatal Intensive Care Unit, University of Patras Medical School, Greece

Introduction: A cytokine pathway of the tumour necrosis factor superfamily and its components Osteoprotegerin (OPG) and receptor activator of nuclear factor κB ligand RANKL have been implicated in the pathogenesis of cardiometabolic disease. Maternal pre-eclampsia is currently considered a risk factor for long-term cardiovascular complications in the mother and offspring. The OPG-RANKL axis function is altered in pregnant women with pre-eclampsia, however there is lack of data regarding OPG and RANKl concentratons in their neonates. Methods: OPG and RANKL serum concentrations were measured in 28 premature neonates of mothers with pre-eclampsia, 28 appropriate for gestational age premature and 28 healthy term neonates of normotensive mothers. Results: Neonates of mothers with early onset pre-eclampsia had significantly higher OPG levels compared to preterm and term neonates of normotensive mothers (Kruskall-Wallis $p<0.0001$). Also, RANKL concentrations of neonates of pre-eclamptic mothers exhibited significantly lower concentrations in comparison to preterm and term neonates of normotensive mothers (Kruskall-Wallis $p=0.014$). Linear regression analysis showed that pre-eclampsia ($p<0.0001$), birth weight SDS score ($p=0.048$) and antenatal steroid administration ($p=0.034$) were significant determinants of high OPG levels. Multivariable linear regression analysis showed that maternal pre-eclampsia was an independent predictor of increased diastolic and mean blood pressure in the offspring; however, its effect on systolic blood pressure was not significant Conclusion: Early-onset pre-eclampsia, a relatively high birth weight and antenatal steroid administration affect OPG concentrations. Pre-eclampsia is an independent predictor of increased diastolic and mean blood pressure in the offspring and is possibly implicated in the ‘fetal programming’ of the cardiovascular system.