

## ABSTRACT

### **PRE-ECLAMPSIA IN JAMAICAN WOMEN: Lipid Profile, Oxidative Stress, Nitric Oxide Status and Nitric Oxide Synthase Polymorphisms and their Relationship to Pregnancy Outcome**

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This study examined the lipid, nitric oxide (NO) and oxidative stress status of Jamaican women with pre-eclampsia (PE). Additionally, it investigated whether booking blood pressures (BP) and polymorphisms in the endothelial nitric oxide synthase (eNOS) gene predisposed to developing the disorder. The effect of PE on pregnancy outcome was also investigated.

The study involved 103 participants (50 PE, 53 controls). Blood samples were collected in the fasted state and BP, anthropometric, demographic and pregnancy outcome data were obtained. Total cholesterol, high density lipoprotein (HDL) cholesterol, low density lipoprotein (LDL) cholesterol, very low density lipoprotein (VLDL) and triglyceride were assessed. Plasma hydroperoxide and NO were also measured. Genotyping was done by Polymerase Chain Reaction/Restriction Fragment Length Polymorphism (PCR/RFLP).

In PE, perinatal mortality was 8% (0% in controls), babies were delivered earlier ( $258.02 \pm 23.62$  days in cases versus  $272.88 \pm 12.07$  days in controls;  $p < 0.001$ ), were of lower birth weights ( $2573.48 \pm 791.01$ g in cases versus  $3172.65 \pm 551.85$ g in controls;  $p < 0.001$ ) and placentas weighed less ( $540.02 \pm 86.22$ g in cases versus  $631.15 \pm 148.30$ g in

controls;  $p=0.019$ ). The severity of PE was negatively associated with gestational age, birth weight and placental weight. Booking BP was higher in women who later developed PE and baby's weight was predicted by first trimester systolic BP and all measures of third trimester BP. Higher levels of triglyceride ( $2.15\pm 0.09\text{mmol/L}$  vs.  $1.67\pm 0.48\text{mmol/L}$ ) and VLDL ( $0.99\pm 0.41\text{mmol/L}$  vs.  $0.77\pm 0.22\text{mmol/L}$ ) existed in PE ( $p=0.001$ ). HDL-cholesterol was lower in PE ( $0.78\pm 0.23\text{mmol/L}$  vs.  $1.04\pm 0.32\text{mmol/L}$ ;  $p<0.001$ ) while total cholesterol and LDL-cholesterol were similar in both groups. Plasma hydroperoxides were higher in cases ( $270.00\pm 50.10$  U.CARR units vs.  $250.48\pm 46.96$  U.CARR units;  $p=0.048$ ) and were positively correlated with LDL-cholesterol in PE ( $p=0.016$ ) and triglycerides and VLDL in controls ( $p=0.026$ ). Plasma nitrite (NO synthesis) was increased in PE ( $21.9\pm 5.4\mu\text{M}$  vs.  $19.2\pm 5.7\mu\text{M}$ ;  $p=0.015$ ) but was not related to BP. Allelic frequencies were similar in both groups for all except the G10T polymorphism where the mutant allele was higher in the controls.

In the Jamaican population, booking BP may be predictive, while dyslipidaemia and oxidative stress are associated with PE. NO synthesis increases in PE but is not associated with BP. Any association of the polymorphisms with PE may be better investigated using a population-based study.

**Keywords:** Pre-eclampsia, blood pressure, lipids, oxidative stress, nitric oxide, polymorphisms, endothelial nitric oxide synthase, hydroperoxides, genotyping, Polymerase Chain Reaction/Restriction Fragment Length Polymorphism