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The role of trace and ultra-trace elements in pathogenesis of pre-eclampsia

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Pre-eclampsia is defined as hypertension associated with proteinuria arising De *novo* after the 20th week of gestation in a previously normotensive woman and resolving completely by the 6th postpartum week. It is a major cause of morbidity and mortality during pregnancy. In UK, pre-eclampsia affects 3-5% of pregnancies. Its aetiology remains incompletely understood, and is considered as a disease of theories. One of these theories refers to the effect of heavy metals, trace and ultra-trace elements in the corresponding patients. In the present study some trace and ultra-trace elements were estimated to identity their role in the pathogenesis of pre-eclampsia. This study was carried out in Babylon Teaching Hospital for Gynecology and Pediatrics, in Babylon Province, Hilla City. All samples were collected from November 2014 till February 2015. This is a case control study which included 120 women, 60 were patients diagnosed with preeclampsia in the third trimester and the other 60 were healthy pregnant women (controls) in the third trimester. Cases with age over 40, BMI>30, previous history of pre-eclampsia, family history of pre-eclampsia, multiple pregnancy and hydrops fetalis, pre-existing hypertension or renal disease, pre-existing vascular disease, anti-phospholipid syndrome and smoking were excluded. Serum levels of iron, zinc, magnesium were measured by using a colorimetric method, while serum concentrations of copper, chromium, cobalt, manganese, molybdenum and selenium were measured by using graphite furnace atomic absorption spectrophotometric technique. The results were expressed as mean±standard error of mean. T-test and the linear regression analysis were used for the determination of the level of significance. Statistical analysis was performed with Statistical Package for the Social Sciences (SPSS) version 21.0 software. A P value of <0.05 was considered to be statistically significant. Serum total iron level was significantly higher in patients with pre-eclampsia compared to control group (186.498 µg/dl versus 94.392, P value<0.05). While no significant difference was found in molybdenum level between them (2.304 µg/dl versus 2.670, P value>0.05). Finally, serum total concentrations of the other elements were significantly lower in patients with pre-eclampsia compared to control group as illustrated below: Copper (143.153 µg/dl versus 209.657 µg/dl, P value<0.05), chromium (0.382 µg/dl versus 0.678 µg/dl, P value<0.05), cobalt (0.143 µg/dl versus 0.330 µg/dl, P value<0.05), magnesium (2.115 mg/dl versus 2.456 mg/dl, P value<0.05), manganese (7.617 µg/dl versus 10.847 µg/dl, P value<0.05), selenium (2.546 µg/dl versus 4.306 µg/dl, P value<0.05) and zinc (57.283 µg/dl versus 87.535 µg/dl, P value<0.05). In conclusion, alteration in the levels of serum trace and ultra-trace elements could contribute to the pathogenesis of pre-eclampsia.

Biography

Dr.Nadia Alhili graduated from Babylon university in the year 1999 with MBChB . Did postgraduate study in Obstetrics and Gynecology and completed it in 2006. Joined Babylon university college of medicine as assistant professor and start supervising postgraduate student and continue in medical researches Currently working as the head of department of Obstetrics and Gynecology and member of the Iraqi Board of medical specialization committee.Her research interest is in reproductive medicine.

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