

Association between Maternal Serum Vitamin D, Oxidative Stress, Angiogenic, and Inflammatory Biomarkers and the Risk of Preeclampsia in Pregnant Women

Dr. Edwar Z Khosho*, Dr. Rasha K J Ali**, Dr. Weaam Faik Mohammed*, Master Rawsan Sabri Ali***

ABSTRACT

Preeclampsia is a hypertensive pregnancy-associated multisystem disorder that is characterized by massive maternal and fetal morbidity. There is an emerging evidence that vitamin D deficiency, oxidative stress, inflammation, and angiogenic imbalance play a role in its pathophysiology. A case control study involving 60 pregnant women in Iraq was done; the subjects were recruited from Al-Basrah teaching hospital for gynaecology and maternity with 30 having preeclampsia and 30 healthy normotensive controls. Women with preeclampsia had markedly lower vitamin D levels than controls (14.06 ± 4.50 vs. 31.54 ± 7.20 ng/mL, $p < 0.001$). They had also elevated oxidative stress as indicated by elevated MDA (5.88 ± 0.93 vs. 2.76 ± 0.82), and decreased antioxidant defenses as measured by less SOD and TAC (all $p < 0.001$). There was a significant increase in inflammatory markers, especially CRP and IL-6 and angiogenic imbalance was observed in the form of increased sFlt-1 and decreased PlGF (all $p < 0.001$). Moreover, the preeclampsia group had lower nitric oxide and higher uric acid (both $p < 0.001$). Preeclampsia was associated with a distinct biochemical pattern involving vitamin D deficiency, oxidative stress, inflammation, angiogenic imbalance, and endothelial dysfunction, supporting the value of combined biomarker assessment in disease evaluation.

Keywords: Preeclampsia; Vitamin D; Oxidative stress; Inflammatory biomarkers; Angiogenic factors; sFlt-1; PlGF; Pregnancy.

Bahrain Med Bull 2026; 48 (3): 3503 - 3511

* Assistant Professor, Department of Gynecology and Obstetrics
College of Medicine University of Basra
Basra, Iraq.
Email: edwarzkhosho@gmail.com

** Lecture, Department of Pharmacy
Al-Warka University College
Basra, Iraq.

*** Assistant Lecture, College of Pharmacy
Almaaqal University, Basrah, Iraq.