

RESEARCH ARTICLE

Vitamin D Levels and Their Correlation with Predisposing Factors and Estimated Fetal Weight in Third Trimester of Pregnancy: an Observational Study

Dwiwahju Dian Indahwati,¹ Diana Krisanti Jasaputra,² Arief Budiono,¹ Julia Windi Gunadi,³ Ronny Lesmana,^{4,5} Steven Zerine Putra Kusmawan⁶

¹Department of Obstetrics and Gynecology, Immanuel Hospital, Bandung, Indonesia,

²Department of Pharmacology, Faculty of Medicine, Universitas Kristen Maranatha, Bandung, Indonesia,

³Department of Physiology, Faculty of Medicine, Universitas Kristen Maranatha, Bandung, Indonesia,

⁴Department of Biomedical Sciences, Faculty of Medicine, Universitas Padjadjaran, Sumedang, Indonesia,

⁵Physiology Molecular Laboratory, Biological Activity Division, Central Laboratory, Universitas Padjadjaran, Sumedang, Indonesia, ⁶Faculty of Medicine, Universitas Kristen Maranatha, Bandung, Indonesia

Abstract

Vitamin D has a broad impact on the human body, including affecting the bones and the immune system. Vitamin D deficiency in pregnant women is a risk factor in several circumstances, such as preeclampsia, gestational diabetes, premature birth, and low birth weight babies. This study aimed to determine the vitamin D levels and their relationship to predisposing factors and estimated fetal weight in the third trimester of pregnancy. Eighteen pregnant women in their third trimester of pregnancy who received antenatal care in the Obstetric Clinic of Immanuel Hospital Bandung from January to December 2022 were used as subjects of this study. The inclusion criteria are third-trimester pregnant women, healthy, while the exclusion criteria are currently taking drugs that have side effects in pregnancy or having pregnancy disorders. Blood was taken to measure vitamin D levels, fetal weight was estimated with obstetric ultrasound, and the subjects filled in questionnaires about predisposing factors. The results showed ten pregnant women (56%) had vitamin D deficiency below 20 ng/mL in their third-trimester pregnancy. We found non-significant relationships ($p > 0.05$) between predisposing factors (daily consumption of vitamin D, sun exposure, maternal age), estimated fetal weight, and vitamin D levels. This study concludes that 56% of pregnant women in their third trimester of pregnancy have vitamin D deficiency with no significant relationship with its predisposing factors and estimated fetal weight.

Keywords: Daily consumption, fetal weight, maternal age, third-trimester pregnant women, vitamin D

Introduction

Vitamin D has a broad impact on the human body, including affecting the bones and the immune system.¹ Vitamin D receptors are present in almost all cells in the body. Vitamin D can enter cells and affect the cell nucleus. Vitamin D also functions as a hormone and vitamin D affects genes in the cell nucleus.² A deficiency of vitamin D will cause disturbances in the brain, causing insomnia, sleep apnea, anxiety, and depression.³

Vitamin D, which can increase the immune system against viruses, can also reduce symptoms of sinusitis. Vitamin D, which has an anti-inflammatory effect, also helps reduce inflammation in these sufferers. Every immune

cell has a vitamin D receptor, which controls cytokine storms and self-defense in autoimmune and allergic diseases.⁴ A deficiency of vitamin D will cause muscle cramps, which is related to calcium, which plays a role in muscle contraction.⁵ A deficiency of vitamin D dramatically affects bones and teeth. A person deficient in vitamin D and calcium can not reach optimum development for the teeth and bones.⁶

Vitamin D in pregnant women plays a vital role, including maintaining the baby's health in the womb. Previous studies have shown that the incidence of vitamin D deficiency and insufficiency during pregnancy ranges from 27.0% to 91.0% in the United States, 39.0% to 65.0% in Canada, 45.0% to 100.0% in Asia,