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The Impact of High-Dosage Vitamin D Supplementation on Insulin Resistance: A Case Report

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ABSTRACT

Introduction: This case report investigates the therapeutic impact of high-dosage vitamin D supplementation on insulin resistance and weight reduction in a 16-year-old female patient presenting with acanthosis nigricans, obesity, insulin resistance related menstrual dysfunction, recurrent hidradenitis and depression.

Case: The patient, with overweight - BMI 26.7, SDS +1,34 exhibited acanthosis nigricans, menstrual dysfunction, recurrent hidradenitis and depressive symptoms. The patient's medical history revealed insulin resistance. She was prescribed metformin with no improvement of body weight and acanthosis nigricans during 12 months. Laboratory findings revealed increased fasting insulin level and Vit D deficiency. Given the concurrent diagnosis of vitamin D insufficiency (serum levels below 15 ng/mL), a high-dosage-weekly 100 000 IU vitamin D3 supplementation regimen was initiated. Throughout the intervention, the patient's fasting insulin level, glucose level, HOMA, IR) and serum vitamin D concentrations were monitored during six months of treatment. The outcomes showed notable improvements in multiple domains. The patient exhibited gradual weight reduction - 5 kg, BMI- 24.7, alongside improvements in insulin sensitivity, evidenced by reduced fasting insulin levels and HOMA-IR scores. The resolution of acanthosis nigricans was observed, coinciding with the elevation of serum vitamin D levels into the optimal range. During 6 month of treatment patient had regular menstrual cycle, she did not have recurrence of hidradenitis. The patient's depressive symptoms showed considerable amelioration during the intervention. The patient reported no adverse effects or complications associated with the high-dosage vitamin D supplementation.

Conclusion: This case report underscores the potential multifaceted benefits of high-dosage vitamin D supplementation in attenuating insulin resistance, aiding weight reduction, and potentially influencing dermatological manifestations, such as acanthosis nigricans, in adolescent individuals with obesity-related complications.

Keywords: Insulin resistance, Obesity, Acanthosis Nigricans, Menstrual dysfunction

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