УДК [61+615.1](06)(043.2)
ББК 5+52.81
А 43
ISBN 978-985-21-1569-8

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THE ROLE OF VITAMIN D AND INOSITOL SUPPLEMENTATION AS AN IMPROVEMENT IN PRECONCEPTION RISK FACTORS IN PCOS

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Polycystic Ovary Syndrome is one of the most common and highly prevalent endocrinological disorder in 4% to 20% of woman of reproductive age around the world. PCOS cannot be totally prevented or cured as it is a multifactorial disease. But early diagnosis and management of the reproductive, hormonal, and metabolic symptoms may prevent long-term complications, such as infertility, pre-diabetes, obesity, diabetes, and heart disease.

Articles from PubMed and Google Scholar databases were closely studied, analysed and reviewed attentively to summarize the subject of the study, where a combination of specific keywords “PCOS”, “Vitamin D”, “Inositol” was used from years 2014 to 2024 to deduce their significant correlation for the aim of the study. Therapeutic approaches from International Evidence-based Guideline for the assessment and management of polycystic ovary syndrome 2023 (Updated, expanded and international current version February 2023), William’s Textbook of Endocrinology and two published books from Springer were used.

Vitamin D is a steroid hormone, and it plays a fundamental role in calcium metabolism, bone structure, anti-inflammatory properties and hormone regulation. According to other recent studies, it was deduced that a deficiency in Vitamin D leads to the derivation of PCOS. Vitamin D deficiency affects the insulin secretion in humans and higher insulin resistance is considered as one of the main key factors of PCOS. Any chronic low-grade inflammation could also contribute to the pathogenesis of PCOS, by disrupting normal ovarian function and hormone production.

Inositol is a natural carbohydrate which is also a Vitamin B derivative. It is found in numerous stereoisomeric forms but the most common forms being Myo-Inositol (MI), the most abundant, and D-chiro-inositol (DCI). This sugar is involved in insulin signalling as their second messengers and any deficiency in inositol could deviate the resistance of insulin and increase the imbalance of production of sex hormones, abnormal steroidogenesis, leading to PCOS.

Approaches for the treatment of PCOS is aimed to promote overall lifestyle of the patient, such as weight management, balanced diet, exercise and stress management. Medications such as oral contraceptives, anti-androgens, insulin sensitizing agents and ovulation induction agents are prescribed to regulate the menstrual cycles and reduce the androgen levels. Other assisted treatments such as IVF, and targeted supplementation therapy are also inducted in the case of deficiencies. Inositol and Vitamin D supplementation is prescribed to improve insulin sensitivity, improve fertility outcomes by reducing androgens, while having side effects such as nausea, bloating, diarrhea and other individual variations depending on their improvement of the symptoms.

Due on the results of the study, vitamin D and inositol may to play an important role in the development and management of PCOS, therefore it is advisable to prescribe these substances not in prophylactic, but in therapeutic doses.