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The Impact of Vitamin D Supplementation on Glycemic Control and Lipid Metabolism in Polycystic Ovary Syndrome: A Systematic Review of Randomized Controlled Trials

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 November 2024 and was last updated on 25 November 2024.

INTRODUCTION

Review question / Objective This systematic review aims to evaluate the effects of vitamin D supplementation on glycemic control and lipid metabolism in women with polycystic ovary syndrome (PCOS), providing evidence for clinical and metabolic management.

Condition being studied Women diagnosed with PCOS, a common endocrine disorder characterized by metabolic and reproductive abnormalities.

METHODS

Participant or population Women aged 18–45 diagnosed with PCOS based on standard diagnostic criteria.

Intervention The intervention investigated is vitamin D supplementation without restrictions on dosage or duration.

Comparator Outcomes of vitamin D supplementation are compared with placebo controls in randomized controlled trials (RCTs).

Study designs to be included RCTs.

Eligibility criteria Women aged 18–45 with PCOS who received vitamin D supplementation; RCTs evaluating metabolic outcomes such as blood glucose, insulin, and lipid profiles.

Information sources Databases searched include PubMed, Embase, Cochrane Library, Web of Science, and ClinicalTrials.gov.

Main outcome(s) Changes in fasting blood glucose, insulin levels, triglycerides, total cholesterol, HDL-cholesterol, LDL-cholesterol, and VLDL-cholesterol following vitamin D treatment.

Quality assessment / Risk of bias analysis Quality was assessed using the Cochrane Risk of

Bias Tool. GRADE methodology evaluated evidence strength for each outcome.

Strategy of data synthesis Meta-analysis used RevMan 5.3 software. Mean differences (MDs) with 95% confidence intervals (CIs) were calculated for continuous outcomes. TSA confirmed the adequacy of the sample size for major outcomes.

Subgroup analysis Subgroup analyses were conducted to evaluate the potential influence of various factors on the effects of vitamin D supplementation in women with PCOS.

Sensitivity analysis Sensitivity analyses were performed to assess the robustness and reliability of the meta-analysis results. The following approaches were used: Exclusion of Individual Studies: Sequentially removing each included study to evaluate its impact on the overall findings and ensure no single study disproportionately influenced the results.

Country(ies) involved China.

Keywords Polycystic Ovary Syndrome; Vitamin D; Randomized Controlled Trials; Metabolic Parameters; Meta-analysis.

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