INPLASY PROTOCOL

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None declared.

A meta-analysis on Vitamin D supplementation and asthma treatment

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Review question / Objective: **The aim of this meta-analysis was to analyze the role of vitamin D supplementation in the treatment of asthma patients.**
Condition being studied: **Vitamin D, as an immunomodulator, may be related to the therapeutic effect of asthma patients, but the research in this area is still controversial.**
Eligibility criteria: **Inclusion criteria: RCTs published in English were included, in which vitamin D was prospectively added after the diagnosis of asthma to explore the role of vitamin D supplementation in asthmatics. The intervention group consisted of asthma patients who received any form or dose of vitamin D supplementation in addition to standard treatment, while those who did not receive vitamin D formed the control group. Then, the asthma-related outcomes were analyzed, including lung function (FEV1), FENO, ACT scores, and the rate of asthma exacerbations. Exclusion criteriaRetrospective and observational studies, articles or preprints not published in peer-reviewed journals, articles that did not mention the results included in our study or for which the data were incomplete, and retrospective vitamin D supplementation studies were excluded.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 June 2022 and was last updated on 11 June 2022 (registration number INPLASY202260049).

INTRODUCTION

Review question / Objective: **The aim of this meta-analysis was to analyze the role of vitamin D supplementation in the treatment of asthma patients.**

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METHODS

Participant or population: Asthma patients.

Intervention: Vitamin D supplementation.

Comparator: Control or placebo.

Study designs to be included: Randomized Controlled Trials (RCTs) of vitamin D supplementation in asthma were searched in PubMed, EMBASE, and the Cochrane library. Primary outcomes were forced expiratory volume in one second (FEV1), asthma exacerbations, Asthma Control Test scores (ACT scores), and fractional exhaled nitric oxide (FENO).

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Information sources: A comprehensive literature search using predefined keywords from articles published over the last decade was conducted on PubMed, EMBASE, and the Cochrane library.

Main outcome(s): Two authors independently extracted the relevant data from the article, including study population (age, country), intervention measures (vitamin D administration method and dose), follow-up time and outcomes (FEV1, FENO, asthma exacerbations and ACT scores), and baseline data related to the results (mean age, FEV1, ACT scores and vitamin D content).

Quality assessment / Risk of bias analysis: The two authors independently evaluated the methodological quality of the included studies based on Cochrane's systematic review guidelines and resolved the differences through discussion with the third co-author. The risk of bias was plotted using Review Manager 5.4 and individual quality analysis was performed using the GRADE-PRO method.

Strategy of data synthesis: In this meta-analysis, we used risk ratio (RR) and standard error (SMD) as the impact measurement standards, R software version 4.1.1 (R project in Vienna, Austria) for statistical analysis and forest mapping. The methodological quality of the study was evaluated using Review Manager Version 5.4 following the Cochrane guidelines. A random effect model was used for statistical analysis due to differences in the mix of interventions and participants. The heterogeneity among studies was assessed by Cochran Q-test, and $P < 0.05$ was considered statistically significant. When data from three or more studies were available, results were summarized using either the standardized mean difference (SMD) for continuous variables or the risk ratio (RR) for dichotomized variables. Statistical analysis was performed using the Mann-Whitney U test, and a two-sided P-value of < 0.05 was considered statistically significant. Using the I2 statistic to evaluate the degree of heterogeneity between included studies. I2 values of 25%, 50%, and 75% were considered low, medium, and high heterogeneity.

Subgroup analysis: In order to explore the impact and heterogeneity of each outcome, prespecified subgroup analyses were stratified by FEV1 baseline values (less than 70% or greater), age (children or adults), and follow up time.

Sensitivity analysis: Sensitivity analyses were performed to check the robustness of

the results by omitting one study and analyzing the remainder in each round.

Country(ies) involved: **China.**

Keywords: **Vitamin D; Asthma; FEV1; Asthma exacerbations; Children.**

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