

# INPLASY PROTOCOL

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**Support:** None

**Review Stage at time of this submission:** Preliminary searches.

**Conflicts of interest:** None.

## Risk factors for vitamin D deficiency in inflammatory bowel disease: a systematic review and meta-analysis

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**Review question / Objective:** Increasing epidemiological data showed that vitamin D deficiency or insufficient was common in patients with inflammatory bowel disease. In addition, vitamin D deficiency has been shown to be related to disease activity and surgery in inflammatory bowel disease, which lead to a worse condition. But the risk factors with vitamin D deficiency in inflammatory bowel disease were converse and uncertain in some studies. The aim of this study is to identify the predictors of vitamin D deficiency in patients with inflammatory bowel disease.

**Condition being studied:** Inflammatory bowel disease represents a group of chronic, immune-mediated inflammatory gastrointestinal disease of unknown etiology. Increasing epidemiological studies have suggested a link between vitamin D deficiency and the incidence of inflammatory bowel disease, but up to date, no quantitative evaluation and critical appraisal of risk factors for vitamin D deficiency in inflammatory bowel disease have been conducted.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 08 June 2020 and was last updated on 08 June 2020 (registration number INPLASY202060028).

### INTRODUCTION

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shown to be related to disease activity and surgery in inflammatory bowel disease, which lead to a worse condition. But the risk factors with vitamin D deficiency in inflammatory bowel disease were converse and uncertain in some studies. The aim of this study is to identify the predictors of

vitamin D deficiency in patients with inflammatory bowel disease.

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## METHODS

**Search strategy:** We conducted a literature search of studies through PubMed, Web of Science, Embase, and Cochrane Library. In addition, review articles on the topic will be searched for eligible articles. The search used the terms “vitamin D”, “ergocalciferol”, “calcifediol”, “inflammatory bowel disease”, “Crohn’s disease”, “ulcerative colitis”, “risk factors” in several combinations. No restrictions were applied for time, language or publication status.

**Participant or population:** Inclusion criteria: (1)Any observational study that reported risk factors of vitamin D deficiency in inflammatory bowel disease patients (ulcerative colitis or Crohn's disease of any ethnicity or sex in all countries and in all settings was included. (2)Vitamin D outcomes were dichotomized into “low” or “normal/high group”. (3)Study evaluated association of risk factors on vitamin D outcomes. Exclusion criteria were the following: (1)Review articles and other systematic reviews or meta-analyses. (2)Non-Human Studies (cell culture, animal models). (3)Any risk factors not reported. (4)Combining other diseases that affect vitamin D levels. (5)Vitamin D outcomes weren't dichotomized into “low” or “normal/high group”. (6)Incomplete data on vitamin D outcome statistical measures (Odds ratios and 95% CIs), unable to calculate outcome measures with available data (number of IBD patients exposed and

unexposed to risk factors with low and high vitamin D outcomes not provided), or studies with authors not responding when contacted with provide additional data/clarification.

**Intervention:** Putative risk factors associated with vitamin D deficiency in inflammatory bowel disease.

**Comparator:** Not applicable.

**Study designs to be included:** Population-based studies including case-control studies, cohort studies, or cross-sectional studies.

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**Information sources:** We conducted a literature search of studies through PubMed, Web of Science, Embase, and Cochrane Library. In addition, review articles on the topic will be searched for eligible articles.

**Main outcome(s):** Incident cases of vitamin D deficiency in inflammatory bowel disease.

**Quality assessment / Risk of bias analysis:** Quality assessment tools for observational studies will be used to assess. The judgment of quality will be assessed by two authors independently, and any discrepancies will be resolved by discussion, or with involvement of a third reviewer when necessary.

**Strategy of data synthesis:** Stata 16.0 software to realize data conversion and effect size combination. A quantitative summation will be done for risk factors, when an adequate number of similar factors are available. Publication bias will

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be assessed by examining funnel plot asymmetry and Egger's test. A fixed-effect model will be applied if the results are homogeneous; if the results are heterogeneous ( $I^2 > 50\%$ ), a random-effects model will be applied.

**Subgroup analysis:** If the results of the study are heterogeneous, we will conduct a subgroup analysis for different reasons. Heterogeneity is manifested in the following several aspects, such as race, gender, disease types, study types, sample size, vitamin D deficiency cut-off value, drugs.

**Sensitivity analysis:** Exclude each study included in the analysis one by one, re-analyze and summarize the data, and compare the differences between the retrieved results and the original results. Therefore, we will be able to discover the impact of individual studies on overall results and whether the results are reliable.

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

**Keywords:** inflammatory bowel disease; vitamin D deficiency; risk factors.

**Contributions of each author:**

Author 1 - Shanzhen Shi.

Author 2 - Jiaying Feng.

Author 3 - Yu Li.

Author 4 - Huaxiu Shi.