

# INPLASY

## Effects of resistant starch supplementation on renal function and inflammatory markers in patients with chronic kidney disease: a systematic review and meta-analysis

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### ADMINISTRATIVE INFORMATION

**Support** - NA.

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

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202420018

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 05 February 2024 and was last updated on 05 February 2024.

### INTRODUCTION

**Review question / Objective** Effects of resistant starch supplementation on renal function and inflammatory markers in patients with chronic kidney disease.

**Condition being studied** RS is a prebiotic that promotes the proliferation of gut bacteria (such as bifidobacterium and Lactobacillus), and can increase the production of metabolites (including short-chain fatty acids), thus providing health benefits. Previous studies have shown that intestinal disorders have significant effects on renal physiology and pathophysiology, including systemic inflammation, urinary toxin accumulation and infection, which may lead to increased morbidity and mortality in ESRD patients. RS resists pancreatic alpha-amylase without being absorbed by the small intestine and is fermented by the gut microbiome after reaching the large intestine, minimizing the negative effects of its imbalance by regulating the gut microbiome. RS is

generally low cost and easy to obtain, and may become an important part of the treatment regimen for patients with CKD. Therefore, this study evaluated the therapeutic effect of RS in patients with CKD through an evidence-based approach.

### METHODS

**Participant or population** Patients with chronic kidney disease.

**Intervention** Resistant starch supplementation.

**Comparator** Control group.

**Study designs to be included** Randomized controlled study.

**Eligibility criteria** The following inclusion criteria were used: 1) the study type was a randomized controlled trial (RCT); 2) The subjects were patients with chronic kidney disease; 3) The intervention

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measure was resistant starch supplementation. The exclusion criteria were as follows: 1) for repeated publications, the largest or latest publication was selected; 2) literature with incomplete or unavailable research data as well as abstracts, reviews, systematic reviews, experience summaries, theoretical discussions, case reports and qualitative studies; 3) animal experiments or in vitro experiments; 4) non-randomized controlled clinical studies.

**Information sources** PubMed, Embase, Cochrane Library, Web of Science and China National Knowledge internet (CNKI) databases from inception to January 20, 2024 by using medical subject headings (MeSH), Emtree and text words with no language limitations.

**Main outcome(s)** Main results include: 1) inflammatory indicators: interleukin-6 (IL-6), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ); 2) renal function indicators: indoxyl sulfate (IS), p-methoxy sulfate (PCS), urea nitrogen (BUN), phosphorus, serum albumin.

**Quality assessment / Risk of bias analysis** The quality of all trials was evaluated independently by two authors according to the Cochrane quality criteria. An overall risk of bias assessment was also performed by each reviewer. Any disagreement between the authors was settled by discussion with a third author. A weighted kappa value was calculated to examine agreement between reviewers for the overall study risk of bias assessment.

**Strategy of data synthesis** STATA 16.0 (Stata Corp LP, College Station, TX, USA) was used to perform statistical analyses. L'Abbe plots and meta-regression were used for intuitive assessment of heterogeneity. For the remaining circumstances, a random effect model was used to pool the effect size to calculate statistical heterogeneity. Heterogeneity was analyzed by  $I^2$  and  $\chi^2$  statistics. If there was significant heterogeneity, an L'Abbe plot and Galbraith plot were generated to evaluate the consistency and quality of the results. Sensitivity analysis, subgroup analysis and meta-regression were performed to determine sources of heterogeneity.

**Subgroup analysis** If there was significant heterogeneity, an L'Abbe plot and Galbraith plot were generated to evaluate the consistency and quality of the results. Sensitivity analysis, subgroup analysis and meta-regression were performed to determine sources of heterogeneity.

**Sensitivity analysis** Sensitivity analysis, subgroup analysis and meta-regression were performed to determine sources of heterogeneity.

**Country(ies) involved** China.

**Keywords** resistant starch, chronic kidney disease, end-stage renal disease, kidney dialysis, randomized controlled trials, meta-analysis.

**Contributions of each author**

Author 1 - Yong Zhang.

Author 2 - Cheng Liu.