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INPLASY

Comparative effectiveness of probiotic strains in children with allergic rhinitis: A systematic review and network meta-analysis

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ADMINISTRATIVE INFORMATION

Support - No.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202470033

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 10 July 2024 and was last updated on 10 July 2024.

INTRODUCTION

Review question / Objective The purpose of this paper is to compare and rank the efficacy of different probiotic strains or combinations in children with allergic rhinitis.

Condition being studied Allergic rhinitis (AR) is a chronic IgE-mediated inflammatory disease of the nasal mucosa that often occurs after exposure to sensitising allergens. The prevalence varies from country to country, but is on the rise globally.AR affects 10-40% of the global population, and self-reported prevalence of AR has been estimated to be approximately 2-27.6% in children. Poorly controlled AR can have a significant impact on children's sleep, cognitive function, growth and development, school productivity and quality of life, and is costly to the healthcare system, placing considerable strain on healthcare providers and society. Traditional management strategies for AR include allergen avoidance, medication and immunotherapy, but are expensive and associated with dizziness and somnolence, necessitating the search for alternative treatments. Recently, probiotics have been widely reported as alternative treatments for AR that modulate the host immune system and it has been shown in previous studies that probiotic therapies can partially improve outcomes by modulating immune homeostasis and reducing the use of anti-allergy medications without significant adverse effects.

METHODS

Participant or population Children with allergic rhinitis.

Intervention One probiotic strain or a combination of several strains.

Comparator Conventional western medicine or placebo or another probiotic strain.

Study designs to be included Randomized controlled trial.

Eligibility criteria 1.Not a RCT study; 2.Not AR patients; 3.Age less than 18 years; 4.No comparing groups.

Information sources The Cochrane Library, Web of Science, Embase, PubMed will be searched without any restrictions.

Main outcome(s) Total Nasal Symptom Score (TNSS).

Additional outcome(s) Pediatric rhinoconjunctivitis quality of life questionnaire (PRQLQ); Immunoglobulin E; eosinophil.

Quality assessment / Risk of bias analysis Randomized trials (RoB 2).

Strategy of data synthesis The Total Nasal Symptom Score (TNSS), and Pediatric rhinoconjunctivitis quality of life questionnaire (PRQLQ) will be displayed as weighted mean differences (MD) with 95% CIs. In view of the heterogeneity between trials, the Bayesian hierarchical random-effects model is first fit for multiple comparisons of different treatment options for AR. On the one hand, all the calculations and graphs will be obtained by using the R4.3.3 software and Stata 15.1 software. Based on the theory of likelihood function and some prior assumptions, Markov chain Monte Carlo (MCMC) simulation will be performed by using Bayesian inference with R 4.3.3 software, 500, 000 in iterations and 20, 000 in annealing are set, to investigate the posterior distributions of the interrogated nodes. The node splitting method will be used to evaluate local inconsistencs for outcomes with closed loops. The relationships among the different treatments will be presented as a network graph, meanwhile, a comparison-adjusted funnel plot will be utilized to test for potential publication bias. Moreover, we will adopt surface under the cumulative ranking probabilities (SUCRA) values to rank the examined treatments, and the SUCRA values will range from 0 to 1. A higher SUCRA value corresponds to a higher ranking for AR compare with other treatments. A league table will be generated to present the comparisons between each pair of interventions within each outcome.

Subgroup analysis Not planned.

Sensitivity analysis None.

Country(ies) involved China.

Keywords allergic rhinitis; children; meta-analysis; probiotics.

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