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ABSTRACT

The impact of prebiotic, probiotic, and synbiotic supplements on CD4, CD8 counts and inflammatory markers in HIV patients: A systematic review and meta-analysis

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Background: HIV infection compromises immune function and depletes CD4+ T-lymphocytes. Prebiotics, probiotics, and synbiotics are potential dietary supplements to improve immune status and manage inflammation in HIV patients. This systematic review and meta-analysis investigated their effects on CD4 count, CD8 count, and inflammatory markers in HIV patients.

Methods: A comprehensive literature search was conducted in PubMed, Embase, and Cochrane Library databases until April 2024. Randomized controlled trials (RCTs) evaluating prebiotic, probiotic, or synbiotic supplements' effects on CD4 count, CD8 count, and inflammatory markers (IL-6 and CRP) in HIV patients were included. Two reviewers independently screened studies, extracted data, and assessed risk of bias using the Cochrane Risk of Bias 2 tool. Meta-analyses used random-effects or fixed-effect models based on heterogeneity.

Results: Fifteen RCTs were included in the meta-analysis. Probiotic supplementation significantly increased CD4 counts compared to placebo (MD = 31.50 cells/μL, 95% CI [9.28, 53.71], P = 0.005). Prebiotic and synbiotic supplements showed no significant effects on CD4 counts. No significant effects were found for probiotics or synbiotics on CD8 counts or inflammatory markers (IL-6 and CRP). Substantial heterogeneity was observed among probiotic studies on IL-6 (I^2 = 75%).

Conclusion: Probiotic supplementation may beneficially affect CD4 counts in HIV patients. The effects of prebiotics and synbiotics remain inconclusive. Further high-quality RCTs with larger sample sizes and longer follow-up periods are needed to clarify these supplements' impact on CD8 counts and inflammatory markers in HIV patients.

Keywords: probiotic, prebiotic, symbiotic, CD4, inflammatory markers

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