DOI: 10.7860/JCDR/2025/80478.21808

Effect of Probiotic and Physiotherapy Interventions to Modulate Gut Microbiota in Inflammatory Arthritis: A Narrative Review

Lakshay Panchal, Demonstrator, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.
Manu Goyal, Professor, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.
Akash Kumar, Assistant Professor, Department of Physiotherapy, Maharishi Markandeshwar Institute of Computer Technology and Business Management (Hotel Management), Maharishi Markandeshwar (Deemed to be university), Mullana, Ambala, Haryana, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Manu Goyal,

Principal, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.

E-mail: manu.goyal@mmumullana.org

ABSTRACT

Inflammatory arthritis is a chronic condition characterised by persistent joint inflammation and systemic immune dysregulation. Emerging evidence highlights that the Gut Microbiota (GM) plays a crucial role in the pathogenesis and progression of inflammatory arthritis. Dysbiosis may contribute to inflammatory arthritis progression through several mechanisms including leaky gut, production of proinflammatory metabolites, dysregulation of the immune system, and molecular mimicry. This review highlights the therapeutic potential of probiotics and physical therapy as complementary interventions targeting GM modulation in inflammatory arthritis. Probiotic supplementation may restore the gut ecosystem, increase the abundance of Short-chain Fatty Acids (SCFAs) producing bacteria, improve intestinal barrier integrity, and promote anti-inflammatory cytokines including interleukin-10. Thus, it mitigates systemic inflammation and reduces disease severity. On the other hand, physical therapy, particularly aerobic exercise, positively modulates GM composition and reduces systematic and intestinal inflammatory markers and endotoxemia. Studies have shown that aerobic exercise increases the abundance of Faecalibacterium and Alistipes, associated with reduced inflammation, improved muscle strength, and enhanced physical function. However, further studies are needed to elucidate the synergistic effects of probiotics and physical therapy in managing inflammatory arthritis.

Keywords: Dysbiosis, Gut-joint axis, Inflammation, Microbiome, Osteoarthritis.