Title: Mechanistic insights into anti-inflammatory and immunosuppressive effects of plant secondary metabolites and their therapeutic potential for rheumatoid arthritis

Author: Yuandani, Ibrahim Jantan, Emil Salim, Abdi Wira Septama, Kamal Rullah, Firzan Nainu, Mohd Fadhlizil Fasihi Mohd Aluwi, Talhah Bin Emran, Miah Roney, Nur Aini Khairunnisa, Halimah Raina Nasution, Muh Fadhil As'ad, Nur Farisya Shamsudin, Maryam Aisyah Abdullah, Haya Luthfiyyah Marwa Rani, Diany Mahabbah Al Chaira, Nabila Aulia

Abstract: The anti-inflammatory and immunosuppressive activities of plant secondary metabolites are due to their diverse mechanisms of action against multifarious molecular targets such as modulation of the complex immune system associated with rheumatoid arthritis (RA). This review discussed and critically analyzed the potent anti-inflammatory and immunosuppressive effects of several phytochemicals and their underlying mechanisms in association with RA in experimental studies, including preliminary clinical studies of some of them. A wide range of phytochemicals including phenols, flavonoids, chalcones, xanthones, terpenoids, alkaloids, and glycosides have shown significant immunosuppressive and anti-inflammatory activities in experimental RA models and a few have undergone clinical trials for their efficacy and safety in reducing RA symptoms and improve patient outcomes. These phytochemicals have potential as safer alternatives to the existing drugs in the management of RA, which possess a wide range of serious side effects. Sufficient preclinical studies on safety and efficacy of these phytochemicals must be performed prior to proper clinical studies. Further studies are needed to address the barriers that have so far limited their human use before the therapeutic potential of these plant-based chemicals as anti-arthritic agents in the treatment of RA is fully realized.

Keywords: Anti-arthritic drugs; Anti-inflammatory; Immune system; Immunosuppressants; Phytochemicals; Rheumatoid arthritis.

DOI: https://doi.org/10.1002/ptr.8147

https://pubmed.ncbi.nlm.nih.gov/38600726/