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The nonpsychoactive cannabis constituent cannabidiol is an oral anti-arthritic therapeutic in murine collagen-induced arthritis.

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Abstract

The therapeutic potential of cannabidiol (CBD), the major nonpsychoactive component of cannabis, was explored in murine collagen-induced arthritis (CIA). CIA was elicited by immunizing DBA/1 mice with type II collagen (CII) in complete Freund's adjuvant. The CII used was either bovine or murine, resulting in classical acute CIA or in chronic relapsing CIA, respectively. CBD was administered after onset of clinical symptoms, and in both models of arthritis the treatment effectively blocked progression of arthritis. CBD was equally effective when administered i.p. or orally. The dose dependency showed a bell-shaped curve, with an optimal effect at 5 mg/kg per day i.p. or 25 mg/kg per day orally. Clinical improvement was associated with protection of the joints against severe damage. Ex vivo, draining lymph node cells from CBD-treated mice showed a diminished CII-specific proliferation and IFN-gamma production, as well as a decreased release of tumor necrosis factor by knee synovial cells. In vitro effects of CBD included a dose-dependent suppression of lymphocyte proliferation, both mitogen-stimulated and antigen-specific, and the blockade of the Zymosan-triggered reactive oxygen burst by peritoneal granulocytes. It also was found that CBD administration was capable of blocking the lipopolysaccharide-induced rise in serum tumor necrosis factor in C57/BL mice. Taken together, these data show that CBD, through its combined immunosuppressive and anti-inflammatory actions, has a potent anti-arthritic effect in CIA.

Comment in

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