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Suppressive effect of methylsulfonylmethane (MSM) on type II collagen-induced arthritis in DBA/1J mice

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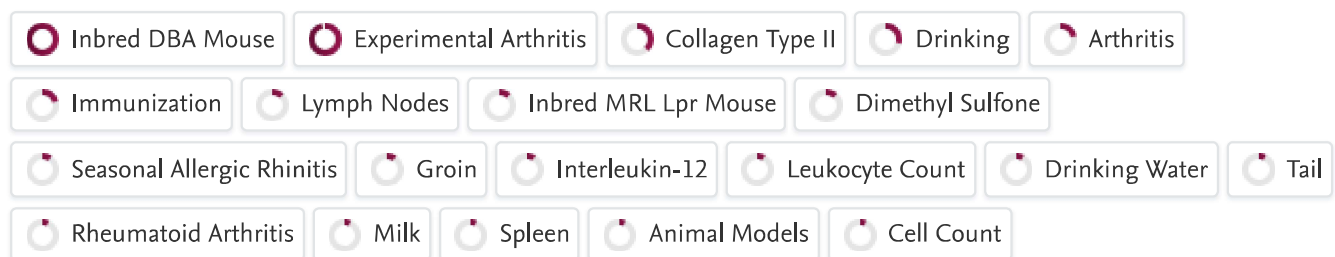
Abstract

Background: Methylsulfonylmethane (MSM) is a natural constituent of the environment found in plants, cow's milk and urine of both bovines and humans. It has been reported that MSM was efficacious in the reduction of symptoms associated with seasonal allergic rhinitis, and protected from the development of murine autoimmune lymphoproliferative symptoms in MRL/lpr mice and the destructive changes in the joints of MRL/Mn/lpr female mice with spontaneous arthritis. In this study, we investigated the effect of MSM on type II collagen-induced murine arthritis as an animal model of rheumatoid arthritis. **Methods:** Murine arthritis was induced as follows. Male DBA/1J mice were injected intradermally at the base of the tail with 200 µg of the type II collagen. Three weeks after primary immunization, the mice were boosted in the same way. Male DBA/1J mice were placed on a continuous treatment regimen with 2.5% MSM in the drinking water, ad libitum, commencing at one week before primary immunization of the type II collagen. The clinical severity of arthritis (deformation and swelling) was scored based on the appearance of each paw which was graded scale. **Results:** The arthritic score (deformation) and swelling score increased gradually

from two weeks up to eight weeks after the type II collagen immunization. On the other hand, the arthritic score in the MSM drinking mice was significantly lower than that in control mice. The total number of leukocytes in inguinal lymph nodes was significantly smaller in the MSM drinking mice than that in control mice. Flowcytometry revealed that the number of B220⁺ cells in the lymph nodes was significantly smaller in the MSM drinking mice than that in control mice. Notably, expression level of IL-12 p40 mRNA was reduced in spleen of the MSM drinking mice as compared with control mice Conclusion: These results suggested that MSM administration was able to modify the immune responses to the type II collagen, resulting in protection of the development of arthritis of type II collagen induced arthritis in DBA/1J mice.

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