

Prevention of Inflammation with DMG in a Collagen-Induced Inflammatory Rat Model

Objective: DMG was evaluated for its ability to reduce the onset of inflammation and swelling in a collagen-induced inflammatory rat model.

Summary: Collagen-induced arthritis (CIA) is a well-established animal model of rheumatoid arthritis and can be used to evaluate the use of substances in reducing inflammation. Dimethylglycine (DMG) has a long history of beneficial uses including modulation of the immune response.

Background: Injection of type II collagen leads to the development of severe polyarticular arthritis in primates and rodents. This model, which relies upon the host's own immune system, is associated with synovitis and erosion of both bone and cartilage leading to severe loss of joint function.

Methods: Female Wistar rats obtained from Charles River Laboratories (Wilmington, MA) were divided into two groups (control and treatment). Rats were injected with type II collagen on day zero. The treatment group was given daily intraperitoneal injections of DMG (100 mg/kg/day) in saline. Collagen was administered intradermal (i.d.) into the left hind foot-pad with a booster injection into the tail one week later. Rats followed for incidence and onset of CIA, as well as degree of paw inflammation. The experimental protocol was carried out under the supervision of the Clemson University Institutional Animal Research Committee.

Results: The control rats showed a 58.3% incidence of inflammation, the rats in the DMG group only showed a 29.6% incidence. DMG treated animals also had a significant reduction in arthritic severity with 8/27 (approximately 30%) of rats showing acute inflammation with an average paw size of 17.2 mm. DMG significantly reduced paw swelling. DMG alone delayed CIA induction by almost 2 days as compared to the control group.

Prevention of Inflammation with DMG				
Group	Treatment (mg/kg/day)	Incidence of Inflammation (%)	Day of CIA Onset (day)	Paw Size (mm)
Control	N/A	58.3	18.7 ± 1.6	19.5 ± 3.8
DMG	100	29.6*	20.4 ± 1.7	17.2 ± 3.0

Rats were treated as indicated and incidence, onset and average paw size were determined. Numbers are given as mean ± s.e.m. * indicates p<0.05 compared to controls.

Conclusion: In this model, DMG was found to be effective in reducing the incidence and degree of inflammation.

Clinical Relevance: This study, along with other data, was submitted for publication in 2007 to substantiate the use of DMG for preventing inflammation and supporting overall joint function.

Lawson J, et al. Prevention of inflammation with DMG in a collagen-induced inflammatory rat model. Clemson University, 1990. Published in BMC Complimentary and Alternative Medicine, 2007, 7:20.