

Abstract

Title: *The anti-inflammatory effects of Methylsulfonylmethane on Carrageenan-Induced paw edema in the Rat*

Background&Objective: *Methylsulfonylmethane (MSM) is naturally occurring organosulfur compound. It is widely distributed in broad range of animal and plant species and their products. Several studies showed that MSM exerts anti-inflammatory, anti-metastatic and antioxidant effects. The purpose of this study was to show the dose response relationship of anti-inflammatory effect of methylsulfonylmethane (MSM) on carrageenan induced rat paw edema as an acute model of inflammation.*

Materials and methods: *A total of 60 male, Sprague–Dawley rats, weighing 180–190 g, were used. 100, 200, 400, 800 and 1200 mg/kg of MSM were administered intraperitoneally to the rats 30 minutes before induction of paw edema with injection of 0.1% carrageenan. The paw diameters of the animals were calculated with digital caliper and 0.1 mL of 1% carrageenan was injected into the hind paw of each animal 30 min after the dose. The change in paw diameter was determined by triplicate measurements carried out at 0, 2, 4, 6, 8 and 24 h using digital caliper. Then 18 rats in three groups (MSM, diclofenac and saline) were chosen for further analysis of paw tissue inflammatory and oxidative markers (MDA, GSH, TNF-alpha and IL-1 beta).*

Results: *The relationship between MSM concentrations and decrease in rat paw edema was calculated using three parameters logistic equation (simple Emax model). A significant reduction in paw edema following administration of MSM at 200, 400, 800 and 1200 mg/kg was observed, but statistical analysis did not revealed any significant reduction in paw edema after administration of 100 mg/kg. MSM did not show statistically significant difference from control group in tissue level of GSH, but it was able to decrease MDA level significantly. MSM was able to significantly alleviate IL-1 β and TNF-alpha tissue levels.*

Conclusion: *In conclusion, based on dose effect study, must appropriate dose of MSM for animal study in rats is 400 mg/kg. The findings of this study suggest that MSM is anti-inflammatory agent.*

Keyword: *methylsulfonylmethane, MSM, inflammation, diclofenac, carrageenan*