

3. Inflammatory Bowel Disease and Glutathione

Oz HS, Chen TS, Nagasawa H. [Comparative efficacies of 2 cysteine prodrugs and a glutathione delivery agent in a colitis model](#). *Translational Research*, 2007;150(2), 122-129.

Study Background

Glutathione is the most important endogenous antioxidant for cellular defense against oxidative stress and is vital for the integrity of the gut. Oxidant-mediated injury plays an important role in the pathophysiology of inflammatory bowel disease (IBD). Reactive oxygen species (ROS) have been implicated in the tissue destruction observed in IBD. These ROS include hydroxyl radical, superoxide radical, hydrogen peroxide and nitric oxide. ROS are extremely unstable because of their high reactivity and can lead to lipid peroxidation and the oxidation of DNA and proteins. Summary: Dextran sodium sulfate (DSS) induced colitis is a well-accepted model that produces colonic inflammation of the gut. This study compared the protective effects of three glutathione promoting agents that included RiboCeine. In this mouse model of colitis, these compounds were incorporated into the daily chow. The animals were provided with normal drinking water, but after three days, the water was supplemented with DSS. All animals remained on the assigned diets until they were euthanized on day 10. Mice administered DSS developed severe colitis and suffered weight loss.

Results: Colonic lesions significantly improved when RiboCeine was incorporated in the food ($P < 0.001$). Colon lengths of the colitis mice (DSS) were significantly decreased because of mucosal inflammation, edema, and thickening (control 109 ± 2.8 mm versus DSS 66 ± 2.8 mm, $P < 0.05$).

Conclusion: RiboCeine reduced disease activity in the mouse model of DSS induced colitis by restoring colonic glutathione and may be a useful dietary supplement for the prevention or possible palliation of IBD in humans.