Daikenchuto attenuates visceral pain and suppresses eosinophil infiltration in inflammatory bowel disease in murine models

Kogure Yoko¹, Hirosato Kanda¹,²,³, Shenglan Wang¹,⁴, Satoshi Yamamoto¹, Koichi Noguchi³, Yi Dai¹,²,³

¹Dept. Pharm. Sch. Pharm. Hyogo Univ. Health Sci., ²Tral Med. Res. Ctr, Chn Med. CI at Hyogo Col. Med., ³Dept. Anat. Neurosci., Hyogo Col. Med., ⁴Sch. Acup-Mox & Tuina, Beijing Univ. Chn Med.

Background and Aims: Daikenchuto (DKT), a traditional Japanese formula, comprises four herbal medicines and is used for abdominal pain. Inflammatory bowel disease (IBD) includes ulcerative colitis (UC) and Crohn’s disease (CD) and is characterized by colonic inflammation and chronic abdominal pain. The present study aimed to investigate whether DKT suppresses colonic hypersensitivity and inflammation associated with IBD in animal models.

Methods: Sprague-Dawley rats were administered 4% sodium dextran sulfate (DSS) or trinitrobenzene sulfate (TNBS) in the colon to establish UC or CD models, respectively. DKT and 5-aminosalicylic acid (5-ASA) were administered orally once a day from Days 3 to 7 after induction of colitis. On Day 7, visceral pain and inflammation were evaluated by measuring the visceromotor response (VMR) to colorectal distention (CRD) and inflammatory indicators including histological score, length of leukocyte infiltration, MPO activity and eosinophil count.

Results: DSS and TNBS increased VMR to CRD and the inflammation indicators. DKT but not 5-ASA, suppressed the VMR to CRD in DSS- and TNBS-treated rats. DKT and 5-ASA decreased the eosinophil count in both IBD models. In DSS-treated rats, 5-ASA but not DKT suppressed the MPO activity. In TNBS-treated rats, neither 5-ASA nor DKT suppressed MPO activity.

Conclusion: These results suggest that DKT is beneficial for abdominal pain associated with IBD. The anti-inflammatory effect of DKT on IBD may involve inhibition of eosinophils. The mechanism of anti-inflammatory effect of DKT partially differs from that of 5-ASA. Co-application of DKT and conventional medicine may produce positive synergy effect for IBD treatment.