Influence of DSS-induced colitis on kidney injury and ECM change of mice

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Background:
Inflammatory bowel diseases (IBDs) are chronic diseases of gastrointestinal tract, characterized by inflammation and mucosal damage. IBD is known to associate with complex crosstalk between immune response and oxidative stress thus extraintestinal manifestations are commonly investigated which can be crossed to other organs including kidney. Recent study showed that dextran sulfate sodium (DSS)-colitis induced renal injury through proinflammatory cytokines such as IL-6, TNF-α and COX-2. However, renal injury induced by DSS-colitis is still unknown. This study is to clarify the influence of DSS-induced colitis on kidney injury and ECM change of mice.

Methods · Results · Discussion:
Mice treated with 3.5% (w/v) DSS in drinking water for eight days were subject to further investigation. Histological results showed high-level neutrophil/monocyte infiltration in both colon and renal tissue, suggesting DSS-induced both colitis and renal inflammation. HE staining revealed tubular cell swelling and injury. Moreover, western blotting analysis indicated increased protein expression of neutrophil inflammation mediator COX-2 and iNOS in renal cortex. These results indicated that DSS treatment leads to increased renal inflammation during acute colitis, which caused tissue injury. Furthermore, PAS and MT staining showed glomerular mesangial matrix expansion, vascular adventitia, and thickening on glomerular basement membrane and proximal tubular. These facts suggest that DSS-induced colitis contributes to renal ECM accumulation.