

Experimental model of rat ileitis resembling Crohn's disease

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Crohn's disease (CD) is a chronic, idiopathic and relapsing inflammatory disease of the gastrointestinal (GI) tract. Current theories point to an impaired immune response to microbes within the intestinal flora in a genetically susceptible host. Although the lymphatic obstruction represents one of the main histopathological diagnostic criteria, its etiology is unknown. Many animal models that, in some respects, resemble human CD have been developed, but these models do not represent the complexity of human disease. We planned to obtain an animal model of CD by surgical manipulation of the enteric lymphatic vessels in the TNBS model of rat ileitis. Surgical approach: 12 F344 male rats were surgically treated by ligation and cut of ileo-colic lymphatic chain near the Treitz. The lymph nodes near the ileocecal valve were injected with a sclerosing agent (control group). Surgical and chemical approach: F344 were treated as above and, at the same time, intraluminally ileum injected with TNBS, a chemical reagent able to induce severe enteritis. 6 rats were sacrificed after one week (group 1). 8 rats received two more weekly TNBS injections and then were sacrificed (group 2). Control and treated rats were sacrificed at the same time. Animals were weighted and monitored for clinical manifestations of GI inflammation. At sacrifice, macroscopical changes were noted and ileum and colon specimens were harvested and processed for histopathological analysis. Most of the animals showed adhesions of bowel loops and thickening of the mesentery. Groups 1 and 2: TNBS induced more severe macroscopical features of inflammation in the intestinal wall, such as fistulae, dilatation of the ileum and sometimes intestinal obstruction. Microscopically, we observed transmural inflammatory infiltrate, fibrosis of mesentery, granulomas, and in the most severe cases, signs of neoangiogenesis, derangement of the muscle layers, ulcers and loss of villi in the mucosa. Besides the microscopical inflammatory changes, we evidenced an increased number of dilated lymphatic vessels. Group 1: one week after a single injection, most of the animals partially solved and showed less severe microscopical damages. The surgical and chemical approach did not induce in this rat model the severe fibrosis and the stricture of intestinal lumen that usually lead to surgery in human CD. However, the histopathological features found in these rats resemble the severe pathological features observed in human CD.

Key words

Crohn's disease, ileitis, animal models.