

AB053. Perioperative administration of Ac2-26 loaded nanoparticles facilitates postoperative recovery in a murine model for intestinal anastomotic healing during acute colitis

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Background: Inflammatory bowel diseases represent chronic inflammatory disorders of the gastrointestinal tract. About 80 percent of patients require surgery once in their lifetime. A perioperative pause of immunosuppression oftentimes is not possible. As both, inflammation and immunosuppression, are risk factors for anastomotic healing, there is a strong need for a safe perioperative, anti-inflammatory medication. This study aimed to examine the potential of targeted anti-inflammatory Ac2-26-loaded-nanoparticles (Ac2-26NP) as perioperative treatment for

colitis.

Methods: A murine model of intestinal surgery under colitis was established. Induction of colitis by dextran sulfate sodium for 7 days was followed by performance of colorectal anastomosis. Anastomotic healing was examined in AnxA1-knockout animals and compared to wildtype mice. Treatment groups received perioperative Ac2-26NPs and Scrambled-NPs (placebo) intraperitoneally every 3.5 days. Weight course, bursting pressure of the anastomosis and histological evaluation of anastomotic healing were examined. For statistical analysis T-test as well as Chi-square tests were performed where appropriate. A P value <0.05 was considered significant.

Results: Colitis animals showed an impaired postoperative weight recovery, hampered histological healing and more frequent bursting at the anastomotic suture line compared to control animals. AnxA1-knockout mice showed pronounced inflammation and increased MMP2/9 expression in the early healing phase. Animals treated with Ac2-26NPs showed a faster postoperative weight gain and improved histological healing compared to placebo treated animals.

Conclusions: Mucosal inflammation is a risk factor for anastomotic healing and postoperative recovery. AnxA1 formulated as Ac2-26-NP improves postoperative recovery and histological healing under colitis without functional impairment of anastomotic stability.

Keywords: Inflammatory bowel disease; anastomosis; perioperative treatment

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