## PANCREAS NEWS

# **Probiotics and Severe Acute Pancreatitis**

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Severe acute pancreatitis is frequently associated with necrosis of the gland, and the principal late complication is infection of the necrosis. The gut barrier plays an important role in severe acute pancreatitis; in fact, gut barrier integrity prevents bacteria translocation resulting from an atrophic and leaky gut, and reduces the systemic inflammatory syndrome of the pancreatitis from gut atrophy. The maintenance of gut barrier integrity is one of the goals in the treatment of severe acute pancreatitis. For this reason, enteral nutrition has been proposed for restoring and preventing morphological changes in the gut associated with fasting. Even if it is quite difficult to demonstrate the effectiveness of nutritional support in patients with severe pancreatitis, some studies are available which illustrate the usefulness of this nutritional measure both in reducing the complications of severe acute pancreatitis [1, 2, 3] and those resulting from infections related to other nutritional measures such as total parenteral nutrition [1]. After these initial studies, others were published using different "immunoactive" formulas such as glutamine [4] and omega 3 fatty acids [5, 6]. The authors of these studies claimed that the nutritional formulas proposed worked better than traditional nutritional support. More recently, another method using probiotics has been proposed to reduce the infection of necrosis by intestinal bacteria. A study from Hungary [7] demonstrates that Lactobacillus plantarum 299 together with a substrate of oat fiber administered at a dose of 10<sup>9</sup> organisms for 1 week by nasojejunal tube is effective in

reducing pancreatic sepsis and the number of surgical interventions related to pancreatic damage. This study was carried out in a limited number of patients; subsequently, a multicenter Dutch study named PROPATRIA (probiotics prophylaxis in patients with predicted severe acute pancreatitis) was formulated in order to evaluate whether administration of probiotics in a large study group is able to reduce the infective complications in severe acute pancreatitis and this study is still in progress [8]. While waiting for the results of the Dutch trial, an experimental study on the effects of probiotics on acute pancreatitis has been carried out [9]. In this study, a total of 50 rats were randomly divided into five groups. In Group 1 (control rats), no treatment was given, in Group 2 (the sham group), the rats received an intraperitoneal injection of a 20% solution in 0.15 mol/L NaCl twice, at an interval of 1 h; in Group3 (sham and probiotics), the rats were injected with an equal volume of NaCl and were fed with probiotics via a gastric tube once a day for 5 days; in Group 4 (acute pancreatitis and enteral feeding), the rats received an intraperitoneal injection of 250 mg/100 g body weight of L-arginine as a 20% solution in 0.15 mol/L NaCl twice, at an interval of 1 h; and finally, in Group 5 (acute pancreatitis and enteral feeding with probiotics), the same procedure was used as in Group 4 and probiotics were given by gastric tube. All groups were treated for 5 days and at the end of the experiments a midline incision was made in all rats, and the pancreas and the

mesenteric lymph nodes were removed for analysis. The mean scores of fibrosis, acinar cell loss, edema, parenchymal necrosis, mononuclear cell infiltration, polymorphonuclear leukocyte infiltration, ductal damage and atypical reactive regeneration in the group having acute pancreatitis with enteral feeding with probiotics (Group 5) were significantly lower than in the group having acute pancreatitis with enteral feeding alone (Group 4). Bacterial translocation to the mesenteric lymph nodes occurred in the group with acute pancreatitis and enteral feeding (Group 4), and in the group of rats with acute enteral pancreatitis and feeding with probiotics (Group 5). Four rats with acute pancreatitis and enteral feeding with probiotics had diarrhea and two rats had soft stools for 2 days even if they all recovered. This study was able to demonstrate that enteral feeding with probiotics added can reduce the severity of acute pancreatitis. The study also points out the possible adverse effects of probiotic treatment even if bacterial contamination due to probiotics reported in humans [10] was not found in this study.

**Keywords** Enteral Nutrition; Pancreatitis, Acute Necrotizing; Probiotics

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