Progress in Early Nutritional Support in Acute Pancreatitis

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Abstract: Acute pancreatitis (acute pancreatitis, AP) is an inflammatory reaction caused by cholelithiasis, alcohol, tumor and other factors of pancreatic enzymes, which causes digestion, edema, bleeding and even necrosis. Usually characterized by acute epigastric pain, nausea, vomiting, fever and elevated hematuria amylase, and low back pain, severe patients may experience shock, even multiple organ failure and death. Nowadays, in clinical work, AP patients are usually treated with fasting water, but there is no clear indicator on when and how to open the diet. At present, according to domestic and foreign guidelines and relevant literature, the following can be clearly indicated. ① AP patients should resume solid diet as soon as possible according to their actual tolerance, so as to minimize the risk of infection and death. ② If the patient's oral energy cannot meet their own needs, enteral feeding should be started as soon as possible within 24 to 72 h. ③ TPN/NPO is only indicated for patients with contraindications to enteral nutrition, such as persistent paralytic ileus.

***Keywords*:** Acute pancreatitis, Early nutritional support, Clinical

1. The Reason for Early Oral Intake in Acute Pancreatitis

For a long time, the NPO (nothing per oral) principle has been adopted for patients with acute pancreatitis, with the main goal of minimizing pancreatic enzyme activation and avoiding aggravating pancreatitis and injury. In normal physiological conditions, oral or duodenal feeding stimulates pancreatic exocrine function. However, compared with healthy individuals, patients with acute pancreatitis have a reduced secretion of exocrine enzymes (measured by trypsin levels) and this is related to the severity of the disease and independent of dietary intake. In other words, oral intake does not aggravate the course of AP. Therefore, the current long-term NPO/TPN (total parenteral nutrition) may no longer be the standard treatment principle for pancreatitis [1].

2. The New "Gut Rousing" Concept

Petrov, a professor from the Medical Center of Utrecht University in the Netherlands, proposed a new concept called "gut rousing" (gut rousing), which shifts from the past concept of pancreatic rest and emphasizes the importance of restoring normal gastrointestinal function as soon as possible [2]. By feeding, the gut is stimulated, the intestinal mucosal barrier is protected, bacterial translocation is reduced, bowel dysfunction is avoided, and the risk of a series of severe complications of AP, such as infectious necrotizing pancreatitis and sepsis, is reduced. A new meta-analysis [3] focused on the dietary management of mild AP patients, showing that early initiation of solid food diet is associated with shorter hospital stay compared with gradually increasing dietary intake, and there is no significant difference in postprandial abdominal pain and discontinuation of diet between the two groups. If the initiation of solid food diet is further advanced to "within 24 hours after admission or after bowel sounds return", the benefits are more obvious — the food tolerance and discontinuation rate of the step-by-step feed Based on this, the 2018 American Gastroenterological Association (AGA) guidelines [9] no longer restrict AP to mild cases, allowing all AP patients to choose various diets within 24 hours of admission, including low-fat/normal-fat diets and solid/semi-liquid foods.

3. Early Oral Intake Time for Acute Pancreatitis

The American College of Gastroenterology (ACG) 2013 guidelines [4] suggest that patients with mild AP without nausea, vomiting, and abdominal pain relief may be able to orally consume food afterward. The updated guideline in 2024 [5] further clarifies that patients with mild AP should orally consume food as tolerated within 24-48 hours. The Chinese expert consensus [6] recommends early oral intake (usually within 24 hours) instead of fasting, if tolerated; if not tolerated, enteral

nutrition therapy should be initiated within 72 hours of admission. Some related studies suggest that the standard of early recovery of hunger in acute pancreatitis is superior to the scheme of resuming diet after clinical and biochemical indicators have improved [7]. The ESPEN 2020 clinical nutrition guideline for AP [8] suggests that diet should not be resumed until serum lipase levels have returned to normal. It is recommended to give low-fat soft food because it provides more benefits and tolerability is similar. Based on the results of 11 RCT studies, early and delayed oral intake has no significant impact on the mortality rate of AP patients, but delayed intake is associated with increased risk of pancreatic necrosis requiring surgical intervention (OR, 2.47; 95% CI, 1.41-4.35), infectious necrotizing pancreatitis (OR, 2.69; 95% CI, 0.80-3.60), multi-organ failure (OR, 2.00; 95% CI, 0.49-8.22), and necrotizing pancreatitis (OR, 1.84; 95% CI, 0.88-3.86). Based on this, the 2018 American Gastroenterological Association (AGA) guidelines [9] no longer restrict AP to mild cases, allowing all AP patients to choose various diets within 24 hours of admission, including low-fat/normal-fat diets and solid/semi-liquid foods.

4. Time for Enteral Nutrition in Acute Pancreatitis

Due to pain, vomiting, and bowel obstruction, not all patients can tolerate oral feeding. There is a lack of strong evidence or consensus on the optimal timing for enteral nutrition (EN) in severe AP patients. A randomized controlled trial (Pancreatitis, Very Early Compared with Selective Delayed Start of Enteral Feeding, PYTHON) [10] from the Netherlands compared very early (within 24 hours) versus selective delayed start of EN in high-risk patients with complications of severe AP and found that the infection rates (infective pancreatic necrosis, bacteremia, and pneumonia) and mortality were similar between early EN and "as needed" EN (72 hours after starting oral feeding, if oral feeding could not be tolerated, then EN was initiated) . The time to full oral feed tolerance was shorter in the "as needed" EN group. Therefore, early EN initiation in severe AP patients did not show any advantage. The ESPEN guidelines recommend that AP patients who cannot tolerate oral feeding should receive EN within 24 to 72 hours of admission. For the formula of EN, a standardized polymerized diet is recommended.

When EN is administered, a nasogastric tube or a nasoenteric tube is recommended, both of which have good safety and tolerability. The nasogastric tube is preferred because it is easy to place and has a lower cost (no need for endoscopic or interventional imaging team intervention) and has similar tolerability to a nasojejunal tube, but it is recommended to raise the head of the bed slightly to avoid aspiration [4]. The following situations require nasojejunal feeding [8]: (1) inability to tolerate oral feeding after minimally invasive necrosectomy; (2) severe AP (abdominal pressure < 15 mmHg; start with 20 mL/h and adjust the infusion rate based on tolerance when abdominal pressure ≥ 15 mmHg).

5. The Time of Starting Parenteral Nutrition for Severe Acute Pancreatitis

About 20% of severe AP patients have intravenous nutrition contraindications, mainly including prolonged paralytic ileus, open abdomen, intra-abdominal pressure > 20 mmHg or abdominal compartment syndrome, and mesenteric ischemia, as well as patients who are intolerant to enteral nutrition or cannot achieve the target intake. Only these patients should be given parenteral nutrition. What we want to emphasize is that TPN/NPO should not be given to patients without evidence of intravenous nutrition contraindications.

6. Conclusion

In summary, based on domestic and foreign guidelines, relevant literature and studies, the following can be clearly stated. ① AP patients should resume solid food as soon as possible according to their actual tolerance to minimize the risk of infection and death. ② If the patient's oral energy intake cannot meet their own needs, enteral feeding should be started within 24 to 72 hours. ③ Only when intravenous nutrition contraindications occur, such as patients with persistent paralytic ileus, should the doctor issue TPN/NPO orders.

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