Journal of Hainan Medical University

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Application of nasointestinal feeding tube in treatment of acute pancreatitis

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ARTICLE INFO

Article history:
Received
Received in revised form
Accepted
Available online

Keywords:
Nasointestinal feeding tube
Enteral nutrition
Acute pancreatitis

ABSTRACT

Objective: To observe the clinical effect of nasointestinal feeding tube for enteral nutrition in the treatment of acute pancreatitis. **Methods:** A total of 128 patients with acute pancreatitis who were admitted in our hospital were included in the study and randomized into the treatment group and the control group with 64 cases in each group. Routine pancreatitis treatments after admission in the two groups were performed. On the basis, nasointestinal feeding tube was indwelled in patients in the treatment group for nutrition support. The changes of biochemical and nutritional indicators before and after treatment in the two groups were compared. **Results:** LC, TP, ALB, and Hb after treatment in the two groups were significantly elevated, while AMY and Lipase were significantly reduced when compared with before treatment (P<0.05). The improvement of the above indicators after treatment in the treatment group was more significant when compared with the control group (P<0.05). The comparison of RBC, Scr, BUN, and Ca levels before and after treatment between the two groups was not statistically significant (P>0.05). **Conclusions:** Adoption of nasointestinal feeding tube for enteral nutrition in the treatment of acute pancreatitis can significantly improve the nutritional status; therefore, it deserves to be widely recommended in the clinic.

1. Introduction

Acute pancreatitis is a common acute abdomen in the clinic, with high morbidity and rapid condition change, and multiple organ function damage and various complications can occur with no timely and effective treatments[1]. Inhibiting the secretion of pancreatin in combined with gastrointestinal decompression and intravenous nutrition are commonly involved in the clinical treatment currently, with an accurate efficacy; but not receiving sufficient nutrition support for a long time in the treatment process will affect the rehabilitation. Some researches demonstrate that[2] indwelling of nasointestinal feeding tube for enteral nutrition under the gastroscope can provide sufficient and comprehensive supply for patients with acute pancreatitis, and contribute to the patients' recovery; therefore, it is gradually accepted by the clinical physicians. The study is aimed to observe the clinical effect of nasointestinal feeding tube for enteral nutrition in the treatment of acute pancreatitis.

2. Materials and methods

2.1. General materials

A total of 128 patients with acute pancreatitis who were admitted in our hospital from January, 2012 to October, 2014 were included in the study, among which 74 were male, and 54 were female; aged from 29 to 66 years old, with an average age of (42.37±10.23) years old. The patients were in accordance with the diagnostic criteria of the Diagnosis and Treatment Guideline of Acute Pancreatitis, and confirmed by the laboratory and imaging examinations. The patients were randomized into the treatment group and the control group with 64 cases in each group. The difference of gender, age, and other clinical materials between the two groups was not statistically significant (P>0.05), and it was comparable.

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Foundation project: The study was supported by the Scientific and Technological Planning Project of Science and Technology Agency in Shaanxi Province with the number of 2015SF223.

2.2. Methods

Firstly, the basic treatment methods recommended in the Diagnosis and Treatment Guideline of Acute Pancreatitis were adopted. After admission, the patients were given diet fasting, continuous gastrointestinal decompression, continuous pump perfusion of somatostatin (0.25 mg/h) to inhibit the secretion of pancreatin, proton-pump inhibitor for acid suppression, parenteral intravenous nutrition support, acid-base imbalance and electrolyte disturbance correcting, anti-infection for prevention, and symptomatic treatments. The nasointestinal feeding tube was indwelled in patients in the treatment group for nutrition support. (1) Tube indwelling timing and methods: 72 h after admission, until the condition was stable, especially having no obvious abdominal distension and enteroplegia, the nasointestinal feeding tube was indwelled. Under the gastroscope, the head end of nasointestinal feeding tube was sent to the distal jejunum of Treitz, while the tail end was derived from the nasal cavity to be fixed in the outer auricle. Abdominal perspective was performed to confirm the location of the tube. If the head end of the tube was exceeding the Treitz, the tube indwelling was successful. (2) Nutrition solution preparation and infusion methods: the vegetable juice, rice soup, milk, fruit juice, fish soup, and broth were selected to made the nutrition solution. After successful tube indwelling, on the first day, the patients were given glucose saline injection (500 mL); on the second day, were gradually given the self-made solutions of vegetable juice, rice soup, and milk, which were slowly injected by the disposable syringe through nasointestinal feeding tube, and controlled at temperature of 37-40 ℃, 2 000-2 500 mL/d, 200-300 mL/time, 2-3 h/time. After injection, warm water (20-30 mL) was infused to wash the tube to prevent the obstruction. According to the patients' tolerance degree, the nutrition solution concentration and quantity were gradually increased; meanwhile, the intravenous nutrition infusion amount was gradually reduced until withdrawal. For patients with hyperlipemia or hyperglycemia, the ingredients of nutrition solution were correspondingly adjusted.

2.3. Observation indicators

The morning fasting venous blood before treatment and 1 week after treatment in the two groups was collected, centrifuged, and preserved at -80 ℃ for detection. The levels of biochemical indicators, *i.e.* RBC, LC, Scr, BUN, AMY, Lipase, and Ca, and nutritional indicators, *i.e.* TP, ALB, and Hb were detected.

2.4. Statistical analysis

SPSS 20.0 software was used for the statistical analysis. The measurement data were expressed as mean±SD. The paired t test was used for the intra-group comparison, while the independent t test was used for the comparison between the two groups. $P<0.05$ was regarded as statistically significant difference.

3. Results

3.1. Comparison of biochemical indicators levels before and after treatment between two groups

LC after treatment in the two groups was significantly elevated, while AMY and Lipase were significantly reduced when compared with before treatment ($P<0.05$). The improved degree of the above indicators after treatment in the treatment group was significantly superior to that in the control group ($P<0.05$). The difference of RBC, Scr, BUN, and Ca levels before and after treatment between the two groups was not statistically significant ($P>0.05$) (Table 1).

3.2. Comparison of nutritional indicators before and after treatment

The serum TP, ALB, and Hb levels after treatment in the two groups were significantly elevated when compared with before treatment ($P<0.05$). TP, ALB, and Hb levels after treatment in the treatment group were significantly higher than those in the control group ($P<0.05$) (Table 2).

Table 1
Comparison of biochemical indicators levels before and after treatment between two groups.

Groups	n	Time	RBC (1012/L)	LC (109/L)	Scr (mmol/L)	BUN (mmol/L)	AMY (U/L)	Lipase (U/L)	Ca(mmol/L)
Treatment group	64	Before treatment	121.95±10.62	1.67±0.52	42.25±9.76	4.03±1.26	687.23±289.42	621.07±311.43	1.89±0.06
		After treatment	121.09±10.37	2.66±0.76*#	41.51±11.24	3.69±1.19	63.47±23.45*#	67.79±23.73*#	1.91±0.08
Control group	64	Before treatment	121.86±10.53	1.65±0.59	42.76±9.69	4.10±1.18	679.87±302.15	630.41±301.97	2.09±0.11
		After treatment	122.14±10.41	1.88±0.58*	41.10±10.98	3.75±1.18	72.91±25.17*	77.13±24.21*	1.99±0.10

*$P<0.05$, when compared with before treatment; #$P<0.05$, when compared with the control group.

Table 2
Comparison of nutritional indicators before and after treatment (g/L).

Groups	n	tIME	TP	ALB	Hb
Treatment group	64	Before treatment	68.37±4.02	29.27±3.14	101.92±22.48
		After treatment	78.16±4.37*#	36.18±2.61*#	115.38±15.20*#
Control group	64	Before treatment	69.04±3.96	28.98±2.74	101.87±22.14
		After treatment	73.69±4.03*	34.89±3.03*	108.59±14.97*

*$P<0.05$, when compared with before treatment; #$P<0.05$, when compared with the control group.

4. Discussion

The acute pancreatitis patients are the individuals with super-high metabolism and high decomposition reaction, characterized by proteolysis acceleration, glyconeogenesis, and lipid mobilization strengthening. When there is an attack, the energy consumption is significantly increased when compared with the normal individuals, and the micro-environment is disturbed, resulting in malnutrition, reduced immunity, and second infection, which can even induce related organic failure in a severe condition, leading to death[4,5]. Some researches demonstrate that[6–9] the nutrition support can significantly reduce the occurrence rate of infection and the risk of death in patients with acute pancreatitis.

Parenteral and enteral nutrition supports are involved in the nutrition supports. Long-term parenteral nutrition support can damage the intestinal mucosal barrier function, and induce its atrophy; moreover, can also increase the intestinal bacteria number and the occurrence rate of pancreas and pancreatic tissue infection, and aggravate the condition[10,11]. By adoption of enteral nutrition support, the nutrient substances can be directly sent into the intestinal tract, and be absorbed into the liver through the intestinal tract and portal vein, and directly absorbed by the small intestine, which is in accordance with the physiological metabolism; therefore, enteral nutrition support can rapidly recover the protection function of intestinal barrier, promote the intestines peristalsis, significantly improve the nutritional status, and enhance the immunological function. Moreover, the enteral nutrition support can directly turn the nutrient substance to the small intestine to avoid the stimulation on the pancreas, reduce the secretion of pancreatic fluid, and alleviate the pancreas burden, which is beneficial for the self-repairment and function recovery of the lesioned pancreas[12,13]. Currently, nasointestinal feeding tube for enteral nutrition in the treatment of acute pancreatitis is mostly advocated in the clinic. Some researches demonstrate that[14,15] due to the head end of nasointestinal feeding tube being placed 20 cm from the distal Treitz, injection of nutrient solution into the jejunum can seldom cause the secretion of cholecystokinin and secretin to avoid the recurrence of abdominal pain, reduce the stimulation on the pancreas, inhibit the occurrence and development of inflammatory reaction, make the pancreas maintain in a static state, and promote the rapid recovery of normal biochemical and nutritional indicators. The results in the study showed that LC, TP, ALB, and Hb after treatment in the two groups were significantly elevated, while AMY and Lipase were significantly reduced when compared with before treatment (P<0.05); the improvement of the above indicators after treatment in the treatment group was more significant when compared with the control group (P<0.05), indicating that nasointestinal feeding tube for enteral nutrition in the treatment of acute pancreatitis can effectively improve the nutritional state, and contribute to the self rehabilitation.

In conclusion, adoption of nasointestinal feeding tube for enteral nutrition in the treatment of acute pancreatitis can significantly improve the nutritional status, and accelerate the rehabilitation; therefore, it deserves to be widely recommended in the clinic.

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