

Effect of Enteral Nutrition on Postoperative Recovery in Patients with Appendicitis

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Abstract: By comparing the content of albumin and retinol-binding protein in patients with acute appendicitis before and after surgery, the effect of these two visceral proteins on patients' wounds was reviewed. In addition, after the use of enteral nutrition therapy, the content of anterior albumin and retinol-binding protein in patients was compared, and the effect of enteral nutrition on postoperative recovery in patients with appendicitis was explored. Methods: A review of 100 patients with acute appendicitis treated in the First People's Hospital of Yichang City, People's Hospital of China Three Gorges University from June 2016 to March 2018 was reviewed. Performs endoscopic appendectomy and traditional open appendectomy, respectively. Changes in PA and Bbp levels in patients before and after surgery are detected. After reviewing the patients with acute appendicitis diagnosed and surgically treated by general surgery of the Fifth Clinical Medical College of Yangzhou University, they were divided into two groups after surgery, which were given parenteral nutritional support and normal diet, and observed after a period of time to compare the visceral protein index in the blood with the postoperative healing speed. The relationship between parenteral nutrition and postoperative recovery rate of appendicitis was obtained.

Keywords: Surgery for acute appendicitis, Enteral nutrition, Pre-albumin, Retinol-binding protein.

1. Introduction

Acute appendicitis is a common clinical emergency, and the incidence of this disease accounts for about 1/4 of acute abdomen. [1] The incidence of acute appendicitis is closely related to bacterial infection, fecal stone blockage of the appendix, gastrointestinal dysfunction and other bacterial invasion of the appendix cavity. Acute appendicitis is clinically manifested as fever, abdominal pain, vomiting, abdominal tenderness, etc., which can induce the occurrence of peritonitis with the progression of the disease, and may even cause perforation. [2] Clinical multi-use surgical treatment, usually take the traditional open abdominal appendectomy, although it can effectively remove the diseased tissue, but the operation time is long, the amount of blood loss is large, and the complication rate is also high. [3] In clinical treatment, laparoscopic surgery is a new type of minimally invasive surgery, postoperative patients recover quickly, but due to psychological reasons and surgical time and other factors affected by postoperative gastrointestinal dysfunction, affecting the efficacy of surgery. Patients with acute appendicitis may experience a long period of chronic inflammatory process due to excessive fatigue, low immunity and other reasons before the onset, which will eventually lead to inflammatory infection of the patient's appendix, while affecting the patient's appetite, so that the patient has loss of appetite or digestive tract symptoms. Affecting the intake of nutrition in patients, which the lack of visceral protein content as an important nutrient of the human body will affect the normal healing of the surgical incision, PA and RbP are two important visceral protein index levels, which can be used to judge acute changes in protein, as a sensitive index for detecting nutritional status. These two important visceral protein indexes can accelerate the healing speed of the patient's wound and reduce the time required for hospitalization and rehabilitation. Prior to the 1990s, parenteral nutrition (EN) was seen as an essential treatment

after surgery because it was able to provide adequate rest to the intestine while providing nutrition. In recent years, a number of studies have shown that excessive intestinal overstanding may lead to intestinal mucosa atrophy and increased intestinal permeability, and because of gastrointestinal motility disorders, the microflora overproliferates, which may cause the microflora to displace. [4] Parenteral nutrition can damage humoral and cellular immunity, aggravate the inflammatory response, promote bacterial displacement and increase the risk of infectious complications. [5] Compared with enteral nutrition, parenteral nutrition can maintain intestinal integrity, increase intestinal blood flow, stimulate intestinal contraction and release immunomodulatory substances, inhibit oxidative stress and systemic inflammatory response syndrome, and reduce bacterial displacement. [6] Significantly reduced postoperative hospital stay. Although the use of enteral nutrition in surgical and patients with intestinal diseases has received a lot of recognition, there are few studies on the role of enteral nutrition in elderly patients with appendicitis after surgery, and it is not possible to determine a direct relationship between the two for the time being.

2. Data and Methods

2.1. Clinical Data

100 patients with acute appendicitis [7] who were treated in Yichang First People's Hospital of China Three Gorges University from June 2016 to March 2018 were randomly divided into observation and control groups.

Inclusion criteria: (1) all patients met the diagnostic criteria for acute appendicitis (2) all patients did not receive other drugs before treatment at the hospital; (3) Patients are willing to join the study and sign an informed consent form. Exclusion criteria: (1) exclude patients with a history of previous abdominal surgery; (2) Exclude patients with serious heart, liver, kidney and other organ lesions or other acute

abdomen; (3) Exclude patients with immune dysfunction or systemic infectious diseases.

Among them, there were 50 cases in the observation group, including 29 males and 21 females; Age 21 to 56 years; Including 14 cases of acute purulent appendicitis, 4 cases of acute perforated appendicitis, and 32 cases of acute simple appendicitis; The onset of illness to the duration of presentation is 2.5 to 30 h. Another 50 cases were used as a control group, including 28 males and 22 females; Age 22 to 58 years old; Including 15 cases of acute purulent appendicitis, 5 cases of acute perforated appendicitis, and 30 cases of acute simple appendicitis; The onset to presentation time is 2.0 to 29.5 h. There were no significant differences in the general data of the two groups of participants in terms of sex, age, type and onset to the time of visit, and the difference was not statistically significant ($P>0.05$), which could be compared and analyzed.

2.2. Treatment Methods

Laparoscopic appendectomy was used in the observation group and traditional open appendectomy was used in the control group.

2.3. Observation

Index 5 mL of fasting vein blood of two groups of patients was collected before surgery and 5 days after surgery, and the supernatant was separated by centrifugation. Determination of procalcitonin (PCT) by solid-phase immunochromatography; Immunoturbidimetry for the detection of prealbumin (PA) and retinol-binding protein (RbP)

2.4. Statistical method

The spss 13.0 statistical software was used to analyze the data, and the measurement data was expressed using the mean \pm standard deviation, the paired sample t test was used for the comparison within the group, and the independent sample t test was used for the comparison between the two groups, and the difference was considered to be statistically significant when the $P < 0.05$.

2.5. Clinical data

From July 2014 to January 2017, 27 patients with radical treatment of laparoscopic colorectal cancer completed by the General Surgery Department of Chengfei Hospital were selected [8] and regarded as the control group. From January 2017 to January 2019, 33 patients with laparoscopic radical treatment of colorectal cancer were completed by the General Surgery Department of Chengfei Hospital, and the enteral nutrition preparation "Healing Hormone" was given as the observation group. Exclusion criteria: (1) tumors causing intestinal obstruction in patients with emergency surgery; (2) Patients with distant metastases such as liver and lungs. There were 33 cases in the observation group, aged 70-89 years old, with an average (80 ± 4.5 years old), of which 14 were males and 19 were females. There were 27 cases in the control group, aged 70 to 90 years old, with an average of (80 ± 4.2 years old), of which 13 were males and 14 were females. The sex and age of the two groups of patients were statistically analyzed, and the difference was not statistically significant ($P>0.01$), which was comparable.

2.6. Perioperative nutrition method

Observation group, the patient was given a light diet +

enteral nutrition preparation Kosaisu type II. immediately after admission to the hospital, fasting for 8 h before surgery, oral clear liquid hormone 2 bags for 4 to 6 h before surgery, oral clear liquid hormone began on the first day after surgery, and semi-liquid diet + healing hormone type II was started after exhaust. The control group was diagnosed with a light diet after admission, fasted for 8 h before surgery, ate 500 ml of sugar water 4 to 6 h before surgery, began to eat a liquid diet on the first day after surgery, and began to eat a semi-liquid diet after exhaust.

2.7. Observation indicators

At the time of admission, WBC, CRP, PCT levels, postoperative exhaust time, postoperative complication rate and postoperative hospital stay in the two groups of patients. See Table 3.

3. Discussion

The traditional postoperative diet in patients with acute appendicitis is fasting-liquid diet-semi-liquid diet-solid diet, which is maintained for about 2 to 4 weeks. The traditional view is to emphasize that after colorectal surgery, you choose to fast until the anus is exhausted, and then you can eat through the mouth. Due to the effect of anesthesia and the disease itself and psychological stress, patients with appendicitis will have a certain degree of digestive dysfunction after surgery, affecting the digestion of food and also affecting the absorption of nutrients. Among them, the insufficient content of visceral protein as an important nutrient of the human body will affect the normal healing of the surgical incision, PA (prealbumin) and RBP (serum retinol-binding protein) are two important visceral protein index levels, PA and RBP are two important visceral protein index levels can be used to judge acute changes in protein, as a sensitive indicator of nutritional status, plasma prealbumin and retinol-binding protein concentrations increase significantly after one week of parenteral nutrition support ($P < 0.001$), PA (pre-plasma albumin) is one of the representative indicators of acute phase protein, synthesized by the liver after stimulation by the inflammatory transmitter IL-6, involved in tissue repair and the delivery of vitamin A, and in acute and chronic inflammation and tissue trauma, the concentration decreases. RBP is a transporter of vitamin A in the blood synthesized by hepatocytes, which plays an important role in the metabolism of vitamin A in the body, and the conversion rate is fast during the acute phase reaction, and the malnutrition of the body will change. Although prealbumin and retinol-binding proteins are susceptible to stress and liver and kidney disease, they are more sensitive than other commonly used nutritional parameters as indicators of parenteral nutrition efficacy. Enteral nutrition can effectively increase the content of prealbumin and retinol-binding proteins, speeding up wound healing in patients.

4. Conclusion

4.1. The results data came from patients from the First People's Hospital of Yichang City, People's Hospital of China Three Gorges University Nutrition-related factor levels of patients in the two groups

Before surgery, there was no significant difference in PA and RbP levels between the two groups; Postoperatively, the

PA and RbP levels in the observation group were not significantly different from those in the preoperative group ($P>0.05$), while the PA and RbP levels [(0.025±0.004) g/L and (0.19±0.08) g/L] in the control group were significantly

reduced compared with those in the preoperative and postoperative observation groups ($P<0.05$) as shown in Table 1.

Table 1. Comparison of nutrient-related factor levels in the two groups (g/L)

Group	n	PA		RbP	
		Preoperative	Postoperative	Preoperative	Postoperative
Observation group	50	0.036±0.006#	0.035±0.006	0.27±0.11	0.28±.10#
Control group	50	0.036±0.005*	0.025±0.004	0.25±0.08	0.19±0.08*

Conclusions: It was proved that the content of pre-albumin and retinol-binding protein in the plasma after surgical treatment was lower than that before surgery.

4.2. The results data came from patients in the general surgery department of Chengfei Hospital

The data of this study are processed by PASS17.0 statistical software, the measurement data is expressed by mean ± standard deviation, and the test statistic and the corresponding

P value are calculated by the t-test method, and the difference between $P<0.01$ is statistically significant.

Nutritional comparison before and after surgery for patients ·

At the time of admission, there was no statistical significance ($P>0.05$) differences between the two groups of serum total protein (TP), serum albumin (Alb), plasma albumin (Alb), and hemoglobin (HGB) in the observation group(but no statistically significant ($P>0.01$), and the difference was statistically significant on days 1, 3 and 7 after surgery ($P<0.01$).

Table 2. Comparison of preoperative and postoperative nutritional values between the two groups

group		number	serum total protein(TP)	serum albumin(Alb)	PA	hemoglobin(HGB)
Preoperative	Observation group	33	67.45±5.17	42.21±6.70	119.09±25.05	117.09±118.82
	Control group	27	68.05±5.60	41.60±7.04	130.25±32.87	117.48±17.97
	t value		-0.434	0.342	-1.493	-0.082
	P value		>0.01	>0.01	>0.01	>0.01
The first day after operation	Observation group	33	68.93±5.76	39.30±7.52	132.18±17.20	116.2126.24
	Control group	27	67.89±5.89	34.03±5.56	129.22±32.06	111.2526.45
	t value		-0.69	3.02	0.456	-0.725
	P value		>0.01	>0.01	<0.01	>0.01
The third day after operation	Observation group	33	69.21±5.67	40.63±7.22	162.75±19.35	119.3025.00
	Control group	27	67.81±5.88	33.39±5.06	129.85±31.96	116.5517.74
	t value		-0.937	4.395	4.919	-0.48
	P value		>0.01	>0.01	<0.01	>0.01
The 7th day after operation	Observation group	33	69.33±5.60	43.51±6.51	170.78±19.28	128±10.06
	Control group	27	67.90±5.85	31.33±4.74	132.74±31.93	120±14.52
	t value		-0.961	8.104	5.764	-0.038
	P value		>0.01	>0.01	<0.01	>0.01

Enteral nutrition can effectively improve the index of prealbumin during the patient's perioperative period and play a role in accelerating the healing of the patient's wound.

Regardless of the type of appendicitis surgery, the content of proalbumin and retinol binding protein in the blood of patients can be reduced, and enteral nutrition can effectively increase the content of both and promote wound healing.

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