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Study of the Effect of Preoperative Dietary Intervention on Gastrointestinal Reaction of Microparticle TACE

Weifang Liu, Jingyi Lin*

Beijing Tsinghua Changgung Hospital, Beijing 102218, China

***Corresponding author:** Jingyi Lin, ljya00497@btch.edu.cn

Abstract: *Objective:* To evaluate the effect of preoperative dietary intervention on the gastrointestinal reaction of microparticle transcatheter arterial chemoembolization (TACE). *Methods*: A total of 60 patients with primary liver cancer who were treated in our hospital from January 2018 to October 2018 were selected for this study. The random sampling method was used to divide the patients into an intervention group (30 cases) and a control group (30 cases). The control group received routine intervention, whereas the intervention group received optimized nursing intervention. The incidence of gastrointestinal reactions, the vomiting frequency, the average vomiting volume, the incidence of stomach discomfort, the quality of life, and the anxiety and depression indicators of both groups were compared. *Results*: The results of all indicators of the intervention group were better than those of the control group. The incidence of gastrointestinal reactions in the intervention group was 13.9%, which was lower than 43.3% of the control group. The scores of QLQ-C30 of the intervention group were higher than those of the control group; the SAS and SDS scores in the intervention group were lower than those of the control group. *Conclusion*: Preoperative dietary intervention can reduce the incidence of gastrointestinal reactions of microparticle TACE and improve the symptoms of gastric discomfort among patients.

Keywords: Microparticle TACE; Dietary intervention; Gastrointestinal reactions; Quality of life; Perioperative period

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1. Introduction

Liver cancer is composed of stem cell carcinoma, intrahepatic cholangiocarcinoma, and mixed liver cancer. In China, liver cancer patients account for 50% of new cases every year. Early diagnosis and treatment are important methods to improve the survival rate of patients. Transcatheter arterial chemoembolization (TACE) [1] is where a catheter is selectively inserted into the tumor blood supply target artery. Then, an appropriate amount of embolic agent is injected at a suitable speed to occlude the target artery, which occludes the tumor tissues. It is the primary non-surgical treatment of patients with advanced liver cancer. It can significantly prolong the survival of patients, and its curative effect has been proven clinically [2,3]. Intestinal reactions will increase patients' negative emotions and affect their quality of life. Therefore, in the past, routine fasting was often performed before

surgery, and 6 hours of postoperative fasting was also required. However, studies have shown [4] that long-term fasting will cause damage to the body and cause a series of adverse reactions. Therefore, this study explores the effect of preoperative dietary intervention in order to reduce postoperative gastrointestinal reactions in patients.

2. Materials and methods

2.1. General information

A total of 60 patients with primary liver cancer who were admitted to our hospital from January 2018 to October 2018 were selected for this study. Inclusion criteria: (1) Diagnosed with primary liver cancer based on the "Code for the Diagnosis and Treatment of Primary Liver Cancer," (BCLC Stage B or C); (2) no plans of undergoing surgical resection; (2) aged over 50 years old and under 70 years old; (3) had an Eastern Cooperative Oncology Group (ECOG) Score 0–1 [5]; (4) those who had not used other traditional Chinese medicines, immune enhancers, molecularly targeted drugs, etc., or stopped the those treatments for more than 1 month. Exclusion criteria: (1) present with cardiovascular, cerebrovascular, kidney diseases, or severe hematological diseases; (2) present with severely impaired coagulation function that cannot be corrected; (3) pregnant or breastfeeding women, or those who have pregnancy plans during the study (4) allergic to the drugs used in the test; (5) other conditions that were deemed unsuitable by the research team. The 60 subjects were numbered and divided into two groups by the simple random sampling method. There were 30 cases in the intervention group (optimized preoperative nursing intervention of microparticle TACE) and the control group (routine nursing intervention during the perioperative period of TACE). In the intervention group, there were 17 males and 13 females, with an average age of 50.17 ± 8.28 years and an average disease duration of 6.42 ± 1.19 years. There were 13 cases with portal hypertension and 19 cases with ascites; the control group had 11 males and 19 females, with an average age of 52.29 ± 7.13 years and an average disease duration of 6.78 ± 0.96 years; 11 cases with portal hypertension and 16 cases with ascites. There was no significant difference in gender, age, course of disease, and comorbidities between the two groups ($P > 0.05$), which meant that they were comparable.

2.2. Methods

Patients in both groups were infused with 10 mg tropisetron intravenously before the operation and routinely received treatment such as liver protection and anti-inflammation after the operation, and routine nursing intervention. Routine nursing intervention includes the following aspects: (1) Communicating with patients and providing necessary assistance in a timely manner [6,7]; (2) being patient-centered, which means caring about the patient's emotional well-being and their families.

On top of routine nursing, the patients in the control group fasted for 12 hours before the surgery and fasted for 6 hours after surgery. Meanwhile, the intervention group adopted optimized nursing intervention. The patients in this group were educated on the day before the operation and underwent dietary intervention: (1) normal diet one day before surgery; (2) fasting of solid food for 6 hours before the surgery; (3) consuming 500 mL of sugar water containing 50 g of sucrose 2 hours before the operation under the guidance of the nursing staff; (4) consuming 500 mL of sugar water containing 50 g of sucrose under the guidance of the nursing staff 2 hours after the surgery; (5) the patients were allowed to eat normally 6 hours after the surgery.

2.3. Observation indicators

The times of nausea and vomiting and the amount of vomitus were compared between the two groups on the first day after surgery. According to the staging standard of chemotherapy toxicity developed by WHO [8], vomiting is divided into four grades: grade I (no vomiting), grade II (vomiting 1–3 times/day), grade III (vomiting

4–6 times/day); grade IV (vomiting > 7 times/day). The incidence of stomach discomfort on the second day after surgery was also recorded.

After treatment, the European QLQ-C30 scale [9] was used to evaluate the postoperative quality of life of patients, including five aspects: body, role, emotion, society, and life. The higher the score, the better the postoperative quality of life of the patient.

Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were used to evaluate the patient's mental state [10,11], each scale has 20 items, and each item is scored according to the degree of anxiety and the hospital, with each item ranging from 1–4 points. The total score for each scale is calculated by summing the scores and then converting it to a standard score by multiplying by 1.25. A standard score of ≥ 50 points indicates the presence of anxiety or depression, while a score < 50 is considered normal. Scores of 51–60 points indicate mild depression, 61–70 indicates moderate depression, and > 70 points indicates severe depression.

2.4. Statistical methods

The data was processed and analyzed using SPSS 18.0. The measurement data was expressed as mean ± standard deviation, and a *t*-test was performed. The count data was expressed as percentages and analyzed with the χ^2 test. $P < 0.05$ indicated statistical significance.

3. Results

3.1. Frequency and volume of nausea and vomiting in the first postoperative day

The frequency of nausea, vomiting, and average volume of vomit in the intervention group were significantly lesser than those of the control group ($P < 0.05$). The results are shown in **Table 1**.

Table 1. Comparison of the frequency and amount of nausea and vomiting between the two groups of patients

Group	Average times of nausea (times)	Average times of vomiting (times)	Average vomiting volume (mL)
Intervention group (30 cases)	3.1 ± 0.2	2.6 ± 0.4	104.7 ± 28.4
Control group (30 cases)	8.9 ± 2.7	8.4 ± 1.9	160.2 ± 40.8
t	11.734	16.361	6.115
P	0.000	0.000	0.000

3.2. Incidence of gastrointestinal reactions

The incidence of gastrointestinal reactions in the intervention group was significantly lower than that of the control group ($P < 0.05$). The results are shown in **Table 2**.

Table 2. Comparison of the incidence of gastrointestinal reactions between the two groups after TACE

Group	Nausea	Vomiting	Incidence of gastrointestinal reactions
Intervention group (30 cases)	2	3	13.9%
Control group (30 cases)		7	43.3%
χ^2			5.079
P			0.024

3.3. Postoperative quality of life

The five scores of, role function, bodily function, emotional function, social function, and the quality of life in the intervention group were significantly higher than those of the control group ($P < 0.05$). The results are shown in **Table 3**.

Table 3. Comparison of postoperative quality of life between the two groups of patients (points)

Group	Role function	Bodily function	Emotional function	Social function	Quality of life
Intervention group (30 cases)	84.21 ± 7.28	86.67 ± 8.19	89.12 ± 7.94	87.48 ± 8.36	88.29 ± 7.02
Control group (30 cases)	70.17 ± 4.67	72.33 ± 4.65	74.19 ± 3.98	72.85 ± 4.87	75.15±4.27
t	13.564	12.627	13.848	12.560	13.318
P	0.000	0.000	0.000	0.000	0.000

3.4. Postoperative anxiety and depression

The SAS and SDS scores of the intervention group were significantly lower than those of the control group ($P < 0.05$). Further details are shown in **Table 4**.

Table 4. Comparison of postoperative anxiety and depression between the two groups

Group	SAS	SDS
Intervention group (30 cases)	40.7 ± 11.4	43.2 ± 10.9
Control group (30 cases)	60.9 ± 24.4	58.4 ± 16.8
t	4.108	4.157
P	0.000	0.000

4. Discussion

Microparticle TACE has been widely used clinically, but it has resulted in several complications, such as fever, pain, gastrointestinal reactions, and tumor lysis syndrome. These complications are detrimental to the patient's quality of life and mental health. Large doses of high-concentration chemotherapy drugs are highly toxic and irritating. When the drugs are injected into the liver tissue, some of them flow back into the stomach, causing patients to experience varying degrees of gastrointestinal reactions such as stomach pain, nausea, and vomiting.

In this study, the control group adopted routine intervention with a longer fasting time: fasting for 12 hours before surgery, l and fasting for 6 hours after surgery. The intervention group adopted dietary intervention: the patients' sugar water intake was controlled. The results of this study showed that the incidence of gastrointestinal reactions in the control group was higher than that of the intervention group. This shows that proper preoperative dietary intervention can help reduce postoperative nausea vomiting and other discomforts. This is because routine fasting has little effect on reducing gastrointestinal reactions in patients. Studies have shown that solid food takes about 4 hours to be digested in the stomach, while semi-liquid food takes about 1.5–3 hours, and water is excreted almost immediately after drinking. Therefore, through dietary intervention before surgery, the gastric mucosa is in a normal state of secretion, which resists drug stimulation to a certain extent.

Ma's research [12] confirmed that if patients are in a state of hunger before surgery, their sympathetic nerves are excited, and they are more likely to be irritable, anxious, and uneasy, and vice versa. The results of this study were also consistent with this conclusion. The five scores of quality-of-life of the intervention group were higher than those of the control group, mainly because the preoperative dietary intervention reduced gastrointestinal

reactions. Reduced gastrointestinal reactions also resulted in less anxiety and depression. As a result, the patient's postoperative quality of life significantly improved, which promotes early recovery of patients.

5. Conclusion

In summary, preoperative dietary intervention can significantly reduce the gastrointestinal discomfort of patients after TACE and improve the mental health of patients.

Disclosure statement

The authors declare no conflict of interest.

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