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Research Article

Clinical Application Significance of Nutritional Support Therapy in Patients with End-stage Malignant Tumor

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Abstract: To analyze the effect of nutritional support on clinical efficacy in patients with end-stage malignant tumors. Sample data collection was conducted from April 2015 to July 2017. 54 patients with end-stage malignant tumors were enrolled in the study. They were divided into reference group (n = 27) and experimental group (n = 27) by double-blind method. Conventional treatment was used in the reference group, while nutritional support therapy was used in the experimental group. The treatment effects of the two groups were compared. Post-treatment effect of the experimental group and the reference group was compared using the parameters including total adverse reaction value, cancer-related fatigue score, quality of life, A/G, AS: AL, alkaline phosphatase (ALP), blood urea nitrogen (BUN), anorexia score, ALB, and uric acid (UA). The parameters such as A/G, AS: AL, ALP, BUN, anorexia score, ALB, and UA were also used to compare between pre- and post-treatment. The value of $P < 0.05$ was used to indicate the statistical significance of the test. **Conclusion:** Nutritional support therapy had a superior effect in patients with end-stage malignant tumors.

Keywords: *nutritional support therapy; patients with end-stage malignant tumor; application significance*

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0 Introduction

End-stage malignant tumor is a common indicator associated with the failure of conventional anti-cancer treatments[1], in patients with a prognosis of <3 months. The fundamentals for implementing nutritional therapy during the clinical treatment of end-stage malignant tumor are the timely adjustment of gastrointestinal function, reduction of tumor burden, and improvement of the quality of life (QOL). However, further analysis is needed in the future to determine whether it can extend the survival time. If the patient is malnourished, it may cause serious damage to the function of the organs, reduce the immunity, reduce the degree of patient's tolerance to radiotherapy and chemotherapy, which subsequently increase the incidence of operative mortality and complications, and affect the clinical outcomes[2,3]. The effects of nutritional support therapy in 54 patients with end-stage malignant tumor who were enrolled between April 2015 and July 2017 were explained.

0.1 Basic information

A total of 54 cases of the end-stage malignant tumor patients who were diagnosed and received treatment from April 2015 to July 2017 were enrolled in the study. The grouping was done using double-blind method, with 27 patients in each group. There were 13 males and 14 females in the reference group with the upper and lower limits of 44 years old and 81 years old, respectively, and the median age was 60.55 ± 5.01 years old. There were 14 males and 13 females in the experimental group with the upper and lower limits of 43 and 80 years old, and the median age was 60.22 ± 4.69 years old.

The basic data of patients with end-stage malignant tumors in the experimental group and the reference group were calculated, and $P > 0.05$ indicated no statistical significance.

0.1.1 Inclusion criteria

1. The samples were confirmed by pathological examination, and the NRS2002 score was >3

points. The patients would have prognosis of 3–6 months and with stable vital signs.
2. Consent forms were signed voluntarily by the patients and their families after knowing the contents of the treatment and ethical clearance of the research proposal was obtained from the medical ethics committee.

0.1.2 Exclusion criteria

The following criteria were excluded from the study:
1. Patients with multiple organ failure
2. Patients with unstable vital signs
3. Patients with severe mental disorders.

1 Methods

Conventional treatment was given in the reference group, and the patients were fed with normal liquid food such as milk, vegetable juice and the like. Nutritional support therapy was given in the experimental group. Before the patients were treated, the nutritional status of the patients would be assessed. Nutritional support therapy was individualized according to the patient's disease condition and nutritional status, with 100–120 kJ/kg day as the target calorie. After the patient's caloric needs were met, the diet plan was adjusted in time. In the case of the calories could not meet the needs of the patients, enteral nutrition support therapy was given to patients with partial gastrointestinal function or complete gastrointestinal function. Nasal nutrition or oral administration was used to provide nutrient within the calorie range of 4–8 kJ/ml; the temperature of the nutrient solution was maintained at 38°C, and the concentration was adjusted from low to high, and the principle of capacity intake from small to large was followed.

For patients who could not undergo enteral nutrition therapy, parenteral nutrition support was used and appropriate nutrient solution was given to the patients through peripheral vein injection. These solutions were mainly solutions vitamins, glucose solution, electrolytes, amino acids, and fat emulsion. The use of parenteral nutrition treatment was stopped when the patient's intestinal function was restored and resumed with enteral nutrition therapy.

1.1 Observation indicators

The total adverse reaction value, cancer-related fatigue score, QOL, A/G (total protein and albumin/globulin), AS: AL (glutamic oxaloacetic transaminase: Glutamic-pyruvic transaminase), alkaline phosphatase level test (ALP), blood urea nitrogen (BUN), anorexia score, ALB (serum albumin), and uric acid (UA) of the experimental group and the reference group were analyzed.

1. Anorexia score assessment criteria: Quantitative evaluation of patient's food intake reduction: No anorexia as 0 points; mild anorexia as 1 point (with food intake reduction of 2/3 of intake before the onset of illness); moderate anorexia as 2 points (with food intake reduction of 1/3 to 2/3 of intake before the onset of illness); and severe anorexia was recorded as 3 points (with food intake <1/3 of intake before the onset of illness).
2. According to the Piper Fatigue assessment scale, the evaluation of cancer-related fatigue measures four dimensions which include cognitive dimensions, perception dimensions, behavioral dimensions, and emotional dimensions. The patients were evaluated using a 0 to 10 numeric scare: Severe fatigue recorded as 6 points, moderate fatigue recorded as 3 to 6 points, and mild fatigue recorded as <3 points.
3. QOL assessment criteria: Patients were accessed according to the QOL scale. Three items including mental state, appetite, and daily life were rated, and the total score was 15 points with the higher the value indicates the better QOL.
4. 3 ml of fasting venous blood was collected, centrifuged at 3000 rpm for 10 min, and stored at −20°C. AU2700 protein analyzer was used to detect BUN and UA.
5. Adverse reactions were mainly infection, difficult breathing, palpitation, and bloating.

Table 1 Comparison of the total adverse reaction values between the experimental group and the reference group

Group	Number	Infection	Bloating	Difficult breathing	Palpation	Total adverse reaction
Experimental group	27	1	1	0	0	7.40%
Reference group	27	4	2	1	1	29.62%
χ^2						4.4182
P						0.0355

Table 2 Comparison of A/G, AS: AL, ALP, BUN, anorexia score, ALB, and UA in the experimental group and the reference group

Group	Number	A/G	AS: AL	ALP	BUN (mmol/L)	Anorexia score	ALB (g/L)	UA (μmol/L)
Experimental group	27							
Pre-treatment		3.55±0.69	4.33±0.33	132.55±1.65	4.72±1.30	2.11±0.55	24.55±1.32	242.22±11.32
Post-treatment		1.76±0.33*#	1.67±0.13*#	49.00±0.54*#	5.01±0.05*#	1.99±0.21*#	29.22±0.22*#	163.2±4.22*#
Reference group	27							
Pre-treatment		3.56±0.99	4.32±0.36	133.54±1.36	4.73±1.55	2.13±0.69	24.24±1.01	189.55±10.33
Post-treatment		2.325±0.11#	2.01±0.31#	68.55±0.66#	4.80±0.03#	1.66±0.02#	26.22±0.32#	232.55±4.32#

Compared with the reference group *P<0.05 and pre-treatment #P<0.05. ALP: Alkaline phosphatase, UA: Uric acid, BUN: Blood urea nitrogen

Table 3 Comparison of cancer-related fatigue score and quality of life between the experimental group and the reference group

Group	Number	Cancer-related fatigue score (point)	Quality of life (point)
Experimental group	27	41.22±2.44	83.54±3.33
Reference group	27	21.54±3.05	70.22±2.36
t		26.1809	16.9577
P		0.0000	0.0000

1.2 Statistical methods

The data of 54 patients with end-stage malignant tumors were inserted into SPSS21.0 software. Count data, i.e., total adverse reaction value and measurement data, i.e., cancer-related fatigue score, QOL, A/G, AS: AL, ALP, BUN, anorexia score, ALB, and UA were represented in the form of rate (%) and mean (±standard deviation). χ^2 test and t-test were performed with $P < 0.05$ indicating statistical significance of the tests.

2 Results

2.1 Computational analysis of the total adverse reaction value between the experimental group and the reference group

Data analysis showed that, compared with 29.62% of the reference group, the total adverse reaction value of patients in the end-stage malignant tumors of the experimental group was significantly decreased by 7.40% ($P < 0.05$) [Table 1].

2.2 Computational analysis of patients' A/G, AS:AL, ALP, BUN, anorexia score, ALB, and UA between the experimental group and the reference group

Data analysis showed that the A/G, AS: AL, ALP, BUN, anorexia score, ALB, and UA of the patients with end-stage malignant tumors in the experimental group were significantly differently from the reference group ($P < 0.05$). Besides, there was also significant difference in the readings of A/G, AS: AL, ALP, BUN, anorexia score, ALB, and UA between pre- and post-treatment ($P < 0.05$) [Table 2].

2.3 Computational analysis of cancer-related fatigue score and QOL between the experimental group and the reference group

Data analysis showed that compared with the reference group, the cancer-related fatigue score and QOL of patients with end-stage malignant tumors in the experimental group were significantly larger ($P < 0.05$) [Table 3].

3 Discussion

Malnutrition often occurs in patients with malignant tumor diseases[4], who also prone to cachexia. Rectal cancer, pancreatic cancer, and colon cancer are common malignant tumors of the digestive system. At present, surgery is a common treatment for the management of malignant tumors and has a good prognosis. However, due to the insignificant clinical symptoms in the early stage of the disease, most patients are already in the middle and late stages during the time of treatment. Therefore, the treatments performed for these stages of patients would mainly be chemotherapy, radiation therapy, and immunotherapy. Patients with end-stage malignant tumors are generally unable to meet clinical indications for surgical treatment, radiotherapy, and chemotherapy. Due to the effects of tumor digestive tract, dyscrasia, and inflammatory conditions that

accelerate the body's metabolic rate, it may reduce appetite and induce malnutrition[5,6]. Nutritional therapy given during the clinical treatment of patients with end-stage tumors is beneficial to the maintenance of weight and improves the QOL. Implementing nutritional therapy for patients with end-stage malignant tumors after stabilizing vital signs can improve their intestinal barrier function, helps to control the progression of dyscrasia in appropriate time. Therefore, performing proper treatment after strict control of indications for nutritional therapy under the acknowledgment of the patients and their family members promotes timely improvement of gastrointestinal function in patients and ensures normal metabolism of the body. At present, the main tools for screening nutritional therapy are the subjective comprehensive rating scale, nutritional risk index, nutritional risk screening scale, etc. There are data showed that, for patients with severe dystrophic dyscrasia that received nutritional therapy, the good fat-free body weight could not be maintained, and the long-term survival of patients could not be extended[7,8]. At present, many Asian countries are still carrying out nutritional support therapy for patients with end-stage malignant tumors without prolonging their survival. Therefore, during the implementation of nutritional support for the end-stage malignant tumors patients, risk of therapy has to be accurately assessed, the indications of therapy must be strictly mastered, and the medical resources have to be used rationally with the consent of patients and family members. However, patients who near the end of life, with unstable vital signs and multiple organ failure are not suitable for nutritional support therapy merely. It is necessary to combine molecular targeted therapy, chemotherapy, and supportive therapy to improve the survival[9,10].

The results of the present study showed that there were significant differences in total adverse reaction score, A/G, AS: AL, ALP, BUN, anorexia score, ALB, and UA between the experimental group and the reference group and well as between pre- and post-treatment ($P < 0.05$). It was proven that nutritional support therapy helps to improve nutritional status and cellular immune function. The experimental group had a cancer-related fatigue score and QOL better than the reference group ($P < 0.05$). This showed that the use of nutritional support therapy will help to improve the condition of cancer-related fatigue and improve the QOL.

4 Conclusion

Based on the above conclusions, nutritional support therapy is more effective than conventional treatment in patients with end-stage malignant tumors.

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