

Lymphatic targeting drug delivery system and tumor treatment

Yu Xiao*

Department of Pharmacy , Sichuan University, Sichuan, 610041, China

*Corresponding Author email: 1075996759@qq.com

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Abstract. Research Objective: This study aims at observing the clinical effect of the application of the lymphatic targeting drug delivery system in the treatment of malignant tumors.

Research Methods: The patients with advanced gastric cancer in our hospital are taken as the samples. According to different treatment methods, they were randomly divided into two groups, namely the observation group and the control group. The patients in the control group were treated with fluorouracil, while the patients in the observation group were treated with compound fluorouracil liposome through the application of the lymphatic targeting drug delivery system in the treatment process.

Research Results: In the observation group, a total of six patients experienced adverse reactions, including five patients with nausea and vomiting and one patient with leukopenia, and the incidence rate of adverse reactions was 18.75%. The patients' five-year survival rate was 75%, and the quality of life was 86.32 ± 2.09 points. Compared with the control group, the data differences were statistically significant ($p < 0.05$).

Research Conclusions: The application of the lymphatic targeting drug compound fluorouracil liposome in the treatment of gastric cancer is of great clinical value for increasing the patients' disease control rate, improving the patients' living quality and prolonging the patients' life.

Introduction

Malignant tumors are a major disease that endangers human health. The conventional treatment methods are based on radical surgery combined with radiotherapy and chemotherapy [1-5], which can prolong the patients' life to a certain extent but can lead to patients' more adverse reactions and lower living quality [6]. Some studies have pointed out that the application of the lymphatic targeting drug delivery system in the treatment of malignant tumors has achieved favorable results [7-8]. This paper randomly selects 64 patients from the patients with gastric cancer treated in our hospital from August 2015 to August 2016 as the samples, observing the treatment effect of the lymphatic targeting drug delivery system.

1. Data and methods

1.1 General data

The patients with advanced gastric cancer in our hospital are taken as the samples. According to different treatment methods, they were randomly divided into two groups, namely the observation group and the control group. There were 32 patients aged between 34 and 85 in the observation group, including 16 male patients and 16 female patients, with the average age of 51.20 ± 0.87 , whereas there were 32 patients aged between 40 and 88 in the control group, including 17 male patients and 15 female patients, with the average age of 51.21 ± 0.92 . The comparisons of the patients in the two groups can be made ($p > 0.05$).

1.2 Methods

The patients in the control group were treated with fluorouracil. The method was as follows: the patients were treated with fluorouracil 750mg/d1--5+cisplatin 20mg/d1--5+mitomycin 10mg/d1.

The patients in the observation group were treated with compound fluorouracil liposome through the application of the lymphatic targeting drug delivery system in the treatment process. The usage

and dosage was as follows: (1) the patients were continuously treated with 5--7d-compound fluorouracil liposome 80--120mg/d; (2) the patients were treated with the intravenous injection of cisplatin 20mg/d1--5+mitomycin 10mg/d1.

1.3 Observing indicators

The disease control rate, the incidence rate of adverse reactions, the one-year survival rate and the living quality of the patients in the two groups were respectively observed. The living quality is scored by the SF-36 scale. The higher score indicates the higher living quality.

1.4 Determination standards for the disease control rate

CR: Target lesions have disappeared, or there have been no new lesions for at least 4 weeks. PR: Target lesions have decreased by 30% or more than 30% for at least 4 weeks. SD: Target lesions have not decreased or increased. PD: Target lesions have increased by 20% or over 20%, or there have been new lesions. The disease control rate = $(CR+PR+SD)/32 \times 100\%$.

1.5 Statistical method

SPSS 23.0 software is adopted to process the data. χ^2 test is used for counting, which is represented by (%), while t test is used for measurement, which is denoted by (mean \pm standard deviation). $P < 0.05$ means that the data differences are statistically significant.

2 Result

2.1 Disease control rate of two groups of patients

2.1.1 Disease control rate of observation group

There are 32 patients in observation group, and 28 patients are good controller of disease, which accounts for 87.5% in disease control rate, details are listed in table1:

Table1 Disease control rate of patients in observation group

Item	CR (n/%)	PR (n/%)	SD (n/%)	PD (n/%)	control rate (n/%)
Data(n=32)	10 (31.25)	15 (46.88)	3 (9.38)	4 (12.50)	28 (87.50)

2.1.2 Disease control rate of patients in control group

There are 32 patients in control group, and 29 patients are good controller of disease ,which accounts for 90.63% in disease control rate. In contrast to ovation group,no statistically significant differences are detected.

Table2 Disease control rate of patients in control group

Item	CR (n/%)	PR (n/%)	SD (n/%)	PD (n/%)	Control rate (n/%)
Date(n=32)	10 (31.25)	18 (56.25)	1 (3.13)	3 (9.38)	29 (90.63)

2.2 Adverse effects rate of two groups of patients

2.2.1 Adverse effects rate of patients in observation group

There are 6 patients that appear adverse effects in observation group,in which 5 patients are nausea and vomiting and 1 is leukopenia, and the adverse effects rate is 18.75%,details are listed in table3:

Table 3 Adverse effects rate of patients in observation group

Item	Nausea and vomiting (n/%)	Leukopenia (n/%)	Myocardial ischemia (n/%)	Total (n/%)
Date (n=32)	5 (15.63)	1 (3.13)	0 (0)	6 (18.75)

2.2.2 Adverse effects rate of patients in control group

There are 15 patients that appear adverse effects in control group, in which 12 patients are Nausea and vomiting and 1 is Leukopenia, and the adverse effects rate is 46.88%, details are listed in table 4:

Table 4 Adverse effects rate of patients in control group

Item	Nausea and vomiting (n/%)	Leukopenia (n/%)	Myocardial ischemia (n/%)	Total (n/%)
Data (n=32)	12 (37.50)	2 (6.25)	1 (3.13)	15 (46.88)

2.3 One-year survival rate and the living quality of the patients in the two groups

One-year survival rate of observation group is 75%, and living quality scores (86.32 ± 2.09). In contrast to the control group, the data differences are statistically significant. Details are listed in table 5:

Table 5 One-year survival rate and the living quality of the patients in the two groups

Group	Number(n)	5-year survival rate	Living quality (scores)
observation group	32	24 (75.00)	86.32 ± 2.09
Control group	32	13 (40.63)	65.73 ± 1.84
p	-	<0.05	<0.05

3. Discussion

The lymphatic targeting drug delivery system is one of the treatment methods for malignant tumors^[9-10]. In the current drug delivery method for malignant tumors, drugs are often absorbed orally and enter the cardiovascular system^[11]. When the above drug delivery method is adopted, drugs mostly need to be metabolized firstly through the livers and intestines, resulting in the low drug utilization rate and numerous adverse reactions. As indicated from this study, when the patients with gastric cancer were treated with fluorouracil, a total of 15 patients experienced adverse reactions, including 12 patients with nausea and vomiting, 2 patients with leucopenia and 1 patient with myocardial ischemia, and the incidence rate of adverse reactions was 46.88%. Through the observation of the prognosis of the patients, it is seen that in this group, the patients' five-year survival rate was 40.63%, and the living quality was 65.73 ± 1.84 points. The process of metastasis and proliferation of malignant cells is the process of transferring cells to lymph nodes. Therefore, if the lymphatic targeting drug delivery can be conducted, the drugs will directly act on the metastasis, so that the control rate of malignant tumors can be increased^[12-15]. Lymph is lipophilic, and treating the patients with malignant tumors with liposome or niosome drugs is the main idea of the current lymphatic targeting drug delivery. Compound fluorouracil liposome is a kind of lymphatic targeting drugs. After entering the human body orally, the drugs can enter the assembly process of intestinal lipoproteins and be preferentially transported to the intestinal lymph. Compared with treating the patients only with fluorouracil, treating the patients with compound fluorouracil liposome can make the drugs pertinently act on the lymphatic metastasis, so as to achieve the purpose of killing the tumor cells and inhibiting the progress of the disease. As indicated from this study, after the patients with gastric cancer were treated with the lymphatic targeting drug compound fluorouracil liposome, a total of six patients experienced adverse reactions, including five patients with nausea and vomiting and one patient with leukopenia, and the incidence rate of adverse reactions was 18.75%. Compared with the treatment with fluorouracil, the incidence rate of the patients' adverse reactions was lower, and the safety of medication was higher. In this group, the patients' five-year survival rate was 75%, and

the living quality was 86.32 ± 2.09 points. Compared with the treatment with fluorouracil, the prognosis of the patients was better ($p < 0.05$). Through observing the disease control rate of the patients in the two groups, it is seen that the data differences in the disease control rate between the two drug delivery methods were not statistically significant ($P > 0.05$). It is suggested that the use of the lymphatic targeting drug compound fluorouracil liposome in the treatment of gastric cancer has achieved remarkable treatment effects. Specifically, it can effectively reduce the incidence rate of various adverse reactions, improve the prognosis of the patients and prolong the life of the patients.

In summary, the application of the lymphatic targeting drug compound fluorouracil liposome in the treatment of gastric cancer is of great clinical value for increasing the patients' disease control rate, improving the patients' living quality and prolonging the patients' life.

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