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Influence of antimicrobial agents in postoperative infection for patients with gastric cancer.

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Abstract

Objective: To investigate the effect of antibacterial agents on postoperative infection in the patients treated with gastric cancer surgery.

Methods: From March 2015 to March 2016, a total number of 60 patients suffering gastric cancer enrolled in our hospital were selected and divided into treatment group and control group evenly according to the treatment of different. The control group was treated with cephalosporins (cefoxitin) while the treatment group received the treatment of cephalosporin combined with anti-anaerobic fungal drugs (metronidazole). The treatment effect, recurrence rate, postoperative infection and the distribution of pathogenic bacteria after operation were compared between the two groups.

Results: Compared with the control group, the clinical effect of the treatment group was better, the recurrence of postoperative infection was lower and the distribution of pathogenic bacteria after operation was less of statistical significance with significant difference between two groups (P<0.05).

Conclusion: Antimicrobial drugs can effectively reduce the postoperative infection of patients with gastric cancer and improve the treatment outcomes. But the curative effect of combination therapy is better than that of single drug treatment and it has great significance for preventing postoperative infection in patients with gastric cancer.

Keywords: Gastric cancer, Postoperative infection, Antimicrobial agents.

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Introduction

Gastric cancer is a malignant tumor occurring in the lining of the stomach epithelium. It has high morbidity and mortality, thus threatening the health of human beings [1,2]. Symptoms of gastric cancer include indigestion and stomach discomfort or pain. Infection with bacteria called *H. pylori* is a common cause of gastric cancer. There are different types of treatment for patients with gastric cancer, including surgery, chemotherapy, radiation therapy, chemoradiation and targeted therapy. Among them, surgery is a common treatment of all stages of gastric cancer. However, the infection after surgery is one of the most important factors that influence the treatment efficacy and prognosis. To investigate the effect of antibacterial agents on postoperative infection in the patients received gastric cancer surgery, we selected 60 cases of patients with gastric cancer treated in our hospital from March 2015 to March 2016 as the objects to conduct the case-control study shown as follows.

Material and Methods

General information

A total of 60 cases of patients with gastric cancer treated in our hospital from March 2015 to March 2016 were divided into treatment group and control group according to the treatment of different drugs with 30 cases included in each group. In the control group, there were 20 males and 10 females at the age of 45 to 88, (65.2 ± 25.1 y) old on the average, with the duration of 3 to 6 y, (2.3 ± 4.8 y) on the average. In the treatment group, there were 16 males and 14 females at the age of 52 to 89, (68.2 ± 28.8 y) old on the average, with the duration of 3 to 5 y, (2.9 ± 4.5 y) on the average. There was no significant

difference in the general information between the two groups (P>0.05), suggestive of a comparability.

Treatment methods

All patients underwent gastrectomy for gastric cancer after with related examinations. The control group were given the treatment of cephalosporins: cefoxitin, manufacturer: Qilu Pharmaceutical Co. Ltd., production batch number: Zhunzi H20053634; intravenous injection: 1 g+0.9% saline=250 ml with the injection at the interval of 6h for 1 whole day [3,4]. The treatment group received combination therapy of cephalosporins and anti-anaerobic fungal drugs: intramuscular injection of cephalosporins 1g cefoxitin (30 min) before surgery and intravenous injection of "cefoxitin 1 g+0.9% saline=250 ml" (6 h/24 h) after surgery followed by the treatment of metronidazole, 0.4~0.6 g/1 time, 3 times a day for constant 7 d (1 course) [5,6].

Observation index

The treatment effect, recurrence rate, postoperative infection and the distribution of pathogenic bacteria after surgery were compared between the two groups.

The treatment effect included cure: all the patients returned to normal without any other symptoms; effective: the symptoms gradually reduced; invalid: The patient's condition was not improved and even aggravated. The total effective rate=the cure rate+the effective rate [7,8].

Statistical processing

SPSS19.0 software was used for statistical analysis. Chi-square test was applied to detect the treatment effect, recurrence rate, postoperative infection and the distribution of pathogenic bacteria after operation, $p<0.05$ suggested that the difference had statistical significance.

Results

Comparison of the treatment effect in the two groups

The treatment effect of the treatment group receiving the therapy of cephalosporin combined with anti-anaerobic fungal drugs was significantly better than that of the control group despite the improvement in the both groups and the cure rate and total effective rate of the treatment group also increased notably shown as Table 1 (χ^2=4.800, P=0.028; χ^2=4.320, P=0.038).

Table 1. *Treatment effects of the two groups (n (%)).*

Group	Case	Cure	Effective	Invalid	Total effective rate
Treatment group	30	24 (80.00)	4 (13.33)	2 (0.60)	28 (93.33)
Control group	30	16 (53.33)	6 (20.00)	8 (26.70)	22 (73.40)
χ^2		4.800	0.480	4.320	4.320
P value		0.028	0.488	0.038	0.038

Note: The therapeutic effect of the treatment group was significantly better than that of the control group of statistical significance (P<0.05).

Comparison of the distribution of pathogenic bacteria after operation in the two groups

The distribution of pathogenic bacteria after operation in the two groups was shown in Table 2. The results showed that the infection rate of gram-positive bacteria, gram-negative bacteria and fungi was significantly lower in the treatment group (χ^2=9.317, P=0.002, χ^2=8.523, P=0.004, χ^2=7.177, P=0.007).

Table 2. *Distribution of pathogenic bacteria after operation in the two groups (n (%)).*

Group	Case	Gram-positive bacteria	Gram-negative bacteria	Fungi
Control group	30	12 (40.00)	13 (43.33)	16 (53.00)
Treatment group	30	2 (6.70)	3 (10.00)	6 (20.00)
χ^2		9.317	8.523	7.177
P value		0.002	0.004	0.007

Note: The distribution of pathogenic bacteria after operation in the treatment group was obviously less than that in the control group of statistical significance (P<0.05).

Comparison of postoperative infection in the two groups

Infection occurred in both two groups as shown in Table 3. The results showed that the infection rate in the treatment group was significantly less than that in the control group (χ^2=4.812, P=0.028).

Table 3. *Comparison of postoperative infection in the two groups (n (%)).*

Group	Case	Operative incision	Abdomen	Bellows sum

Control group	30	4 (13.00)	3 (10.00)	3 (10.00)	10 (33.33)
Treatment group	30	1 (3.30)	1 (3.30)	1 (3.30)	3 (10.00)
χ^2		1.964	1.071	1.071	4.812
P value		0.161	0.301	0.301	0.028

Note: The infection rate in the treatment group was significantly lower than that in the control group of statistical significance (P<0.05).

Comparison of the recurrence rate in the two groups

In the control group, there were 6 cases of recurrence, accounting for 20% while in the treatment group there was only 1 case of recurrence, accounting for 3.34%. The recurrence rate of the treatment group was significantly lower than that of the control group of statistical significance (P<0.05).

Discussion

Vigorous development of China's economy in recent years has continuously improved the people's living standard and the fast-paced work and life make people neglect their health with many incidences of such diseases as diabetes, coronary heart disease, peptic ulcer and gastric cancer [9,10] in which gastric cancer has the moderately higher incidence and people prone to have this disease include office workers, driver, the gourmets and the alcoholics [11,12].

Generally speaking, gastric cancer is mainly given surgical treatment with good prognosis and the patients treated with operation in the early stage are cured moderately fast [13,14]. In addition, in the stomach the blood vessels are more abundant than those in other organs and the lymphocytes are widely distributed with greater chances of organ metastasis. The various conditions show that surgery is the best treatment for patients with gastric cancer [15,16]. However, surgical treatment may lead to large probability of infection. Most of cancer patients have poor immunity perhaps with unbalanced nutrition, long postoperative recovery time or inadequate nursing, which all will cause slower healing of incision followed by the large incidence of infection. Thus, the important measure to prevent infection should be the drug treatment before and after operation [17,18].

In this study, we selected 60 patients with gastric cancer from our hospital in which the cure rate was 80% and the total effective rate was 93.33% in the treatment group, which has marked difference of statistical significance when compared with those in the control group (P<0.05); the recurrence rate was 2.5%, significantly different from that of the control group of statistical significance (P<0.05); Also there was significant difference in the distribution of pathogenic bacteria after operation and postoperative infection between the two groups of statistical significance (P<0.05).

In summary, antibacterial drugs enable to effectively reduce the infection of patients after stomach cancer surgery and manage to improve treatment outcomes. But the combination therapy has better efficacy than single drug treatment and it is of great significance in prevention of postoperative infection of patients with gastric cancer, worth being widely applied in clinical trials [19,20].

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