Clinical application of antibiotics in preventing incision infection in general surgery

Lei Jia, Bao Liling

Kunming Medical University Haiyuan College, Clinical Skills Laboratory Center, Yunnan Kunming, 650106, China

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Abstract: To study the clinical effect of preventing wound infection at different times in general surgery with antibiotics. This paper reviews the clinical data of 479 cases of preventive antibiotic surgery treated in our hospital from December 2016 to December 1818. According to the time of antibiotic prevention, the patients were divided into three groups, one hour to two hours before operation. 113 patients in this group were treated by group A. 189 patients in group B were given 0.5-1 hour before operation and 177 patients in group C after operation. To analyze the preventive application of general surgery and compare the infection status and prognosis of each group. Results The infection rate of type I incision and type II incision in group A was significantly lower than that in group B and C. The difference between the two groups was significant (P<0.05). The infection rate of incision and type II incision in group B was significantly lower than that in group C. The difference between the two groups was statistical significance (P<0.05). The melting time, wound infection time and hospitalization time in group A were significantly shorter than those in group B and C. The difference has statistical significance. The fever time, incision infection time and hospitalization time in group B were significantly shorter than those in group C (P<0.05). The use of prophylactic antibiotics in general surgical patients 1-2 hours before operation significantly reduced incision infection rate, shortened fever and hospitalization time, and reduced treatment costs, which indicated that it was worth popularizing in clinical practice.

1. Introduction

Incision infection is one of the most common complications in general surgery. This study concluded that the main causes of wound infection were the level of doctors, the condition of patients, the preparation of surgery and the operating environment. Incision infection can not only reduce the effect of surgery, but also affect the quality of life of patients. Therefore, how to prevent surgical wound infection? Antimicrobial agents are effective in preventing surgical wound infection. The clinical effect of prophylactic use of antibiotics in general surgery is significantly improved. However, unreasonable choice of drugs, treatment time and administration time increase bacterial tolerance, improve the incidence of adverse reactions and reduce surgery. Overall effect. In order to improve the rational use of antibiotics, the clinical data of 479 surgical patients from December 2016 to December 2018 were reviewed, and the clinical efficacy of prophylactic antibiotics for wound infection at different time in general surgery was discussed [3-4].

2. Materials and Methods

2.1 General information

479 patients in general surgery from December 2016 to December 2018 were selected. The selection criteria were age 18-70 years and operation time > 3 hours. The patient signed the consent form with his consent. Exclusion criteria: patients with coagulation, drug allergy, autoimmune diseases, and recent antibiotics. Patients were divided into three groups according to the time of use of antibiotics. 113 cases received prophylactic antibiotics 1-2 hours before operation, 63 cases in group A, 50 males, aged 21-70 years, with an average age of 48.9 (+13.6 years). Primary diseases:

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26 cases of biliary tract stone infection, 17 cases of gastroduodenal ulcer and perforation, 57 cases of digestive tract tumors, 13 cases of intestinal obstruction and abdominal trauma. Group B received prophylactic antibiotics in 189 cases, 108 males and 81 females, aged 18-70 years, with an average age of (47.6 +12.4) years. Primary diseases included gallstones in 46 cases, gastroduodenal ulcer perforation in 31 cases, digestive tract tumors in 89 cases, intestinal obstruction and abdominal trauma in 23 cases. Group C received prophylactic use of antibiotics after operation in 177 patients, 104 males and 73 females, aged 18-69 years, with an average age of (47.2 + 10.9) years. Primary diseases included 41 cases of biliary tract stone infection, 10 cases of stomach, 29 cases of duodenal ulcer and perforation, 85 cases of digestive tract tumors, 22 cases of intestinal obstruction and abdominal trauma. There was no significant difference in age, sex, meta-morbidity and general information of medical drugs among groups ($P > 0.05$). The study was approved by the Hospital Medical Ethics Committee.

2.2 Method

Group A used prophylactic antibiotics 1-2 hours before operation, group B used prophylactic antibiotics 0.5-1 hours before operation, and group C used prophylactic antibiotics. Antimicrobial agents include Hekisanchin, Nitromidazoru, penicillin and mushroom tons. Referring to patients'basic information and relevant medical records, combined with imaging data and blood biochemical examination, active and effective symptomatic treatment is given according to patients' specific conditions. Incidence rate of incision infection, fever time, wound infection time and hospitalization time were recorded.

2.3 Evaluation Criteria for Incision Infection

Surgical incisions are reddened and swollen, skin temperature increases, pain and other symptoms, or purulent exudates in mucosal tissue, or when pus exudates when not covered with gauze, the wound infection is identified.

2.4 Statistical Method

Data were analyzed by SPSS 19.0 software. The measured data are shown as "$\bar{x} \pm s$". Dispersion analysis or t test were used. Counting data represent percentages. χ^2 was used to verify the difference, which was statistically significant ($P<0.05$).

3. Results

3.1 Comparison of incision infection among three groups

The infection rate of type I incision and type II incision in group A was significantly lower than that in group B and C ($P<0.05$). The infection rate of group B incision type I and type II was obvious. If it is lower than group C, the difference has statistical significance ($P<0.05$). The results are shown in Table 1.

Table 1 Comparison of Three Froups of Wound Infections

Incision type				Percentage (%)		
	Group A (n=113)	Group B (n=189)	Group C (n=177)	Group A (n=113)	Group B (n=189)	Group C (n=177)
Type I incision (n=160)	0	1	6	0.0	0.6	3.8
Type II incision(n=319)	7	20	37	2.2	6.3	11.6

Note: Class I incisions are clean incisions, and Class II incisions are possible to contaminate incisions

3.2 Comparison of three groups of prognosis

The antipyretic time, incision infection time and hospitalization time of group A were significantly lower than those of group B, and group C had statistical significance (P<0.05). The fever time, wound infection time and hospitalization time in group B were significantly lower than those in group C (P<0.05). See Table 2.

Table 2 Comparison of the Prognosis of the Three Groups

Group	Number of Cases	Antipyretic Time (d)	Incision Infection Time (d)	Postoperative Hospital Time(d)
Group A	7	2.1±0.3	4.2±0.4	8.3±1.2
Group B	21	3.0±0.5*	6.1±0.3*	10.1±1.6*
Group C	43	4.3±0.7*#	8.0±0.5*#	12.9±1.4*#
F		14.476	13.047	9.542
P		0.000	0.000	0.000

Note: Compared with group A, *P<0.05; compared with group B, #P<0.05

4. Discussion

General surgery is an important part of hospitals. The main surgical methods for the treatment of liver, biliary tract, pancreas, gastrointestinal, anorectal, vascular diseases, thyroid, breast tumors and other diseases. Specialist surgery and complications are varied (5-6), among which infection is the most common [7-8]. If treatment is delayed, it may cause harmful phenomena such as hematoma, incision fluid, infection, delayed cure and so on. In severe cases, a second operation is needed, which can have an impact on the prognosis of patients. Antimicrobial agents are metabolites produced by microorganisms that are resistant to pathogens and interfere with cell growth and development [11-12]. These are widely used in clinical practice, and have great anti-infective effect after operation. However, unreasonable use of antibiotics will affect the therapeutic effect and cause bacterial-resistant infections. Therefore, before clinical application of antibiotics, we must master the use time of drugs. Now, many surgeons believe that the use of antibiotics during surgery, based on the safety of surgery, can effectively reduce the incidence of infection. However, some scholars have pointed out that the abuse of antibiotics has increased tolerance in recent years. Antibiotics should not be used blindly in general surgery.

4.1 Surgical notch type

In general surgery, the infection rate of incision is significantly reduced when antibiotics are used, but not all operations are suiTable for the use of antibiotics. Notch surgery is usually superficial. In general, antibiotics are not recommended for such operations. Unless there is a great deal of damage, the operation may take a long time, or infection may have serious consequences. According to this study, the infection rate of type I and type II incision in group A was significantly lower than that in group B and C, with statistical significance (P<0.05). The infection rate of type II incision in group I was significantly lower than that in group C, with statistical significance (P<0.05).

4.2 Time of use of antibiotics

The fever time, incision infection time and hospitalization time of group A were significantly lower than those of group B. The difference between group C and group B was statistically significant (P<0.05). The fever time, wound infection time and hospitalization time of group B were significantly lower than those of group C (P<0.05). The results showed that the effect of prophylactic use of antibiotics in general surgical patients was better than that in preoperative 1-2 hours. It could reduce the risk of wound infection, shorten the recovery time, inhibit the development of the disease and improve the prognosis of patients. According to another study [10], when antibiotics were used before and after surgery, the same type of incision infection was

significantly higher than during surgery. Preventive antibiotics are considered the best two days from the first day before surgery. However, according to recent studies, this time node can not achieve the purpose of prevention, there are also the possibility of flora failure and drug-resistant stocks. The risk of large incision infection after surgery prolongs the use of antibiotics after infection [11]. In addition, some experts believe that it is unreasonable to use antibiotics to prevent bacterial infection after operation. Suture of surgical incision is an important period of bacterial infection. In this process, the application of antibiotics is very helpful to prevent bacterial infection. Therefore, the “Guidelines for Clinical Application of Antibiotics” stipulate that the peak plasma concentration can be used to prevent infection if antibiotics are taken 30 minutes to 2 hours before the operation or before the beginning of anesthesia.

5. Conclusion

In a word, the patients'own condition, the type of incision, the type of antibiotics, the difference of the main reasons for the patients' taking time, and the possibility of different results for the prevention of surgical wound infection. Therefore, the use of prophylactic antibiotics in general surgery must be closely combined with the patient's own characteristics. The types of surgical incisions and the related situation of antibiotics should be strictly applied in accordance with the relevant regulations to reduce the incidence of postoperative infection.

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