

Effect of pharmaceutical intervention in promoting rational use of antibiotics in the hospital

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Abstract. Objective: To analyze the effect of pharmaceutical intervention on reducing the incidence rate of irrational drug use during the use of antibiotics in patients. Methods: A total of 840 patients treated with antibiotics in our hospital were divided into the experimental group (420) and the control group (420) by random number expression. The control group was not given pharmaceutical intervention and the experimental group was given pharmaceutical intervention during drug use, and the irrational use of antibiotics, combination of antibiotics, drug expense and drug course were compared between the two groups. The incidence rate of irrational use of antibiotics, combination of antibiotics, drug expense and drug course were compared between the two groups. Results: The incidence rate of irrational use of antibiotics (5%) in the experimental group was lower than that (25.95%) in the control group, the proportion of combination of antibiotics (95.48%) was higher than that (79.19%) in the control group, the drug expense [(115.36±11.25) yuan] was lower than that [(264.35±21.31) yuan] in the control group, and the duration of antibiotics [(3.24±0.54) days] was shorter than that [(5.24±0.68) days] in the control group ($P < 0.05$ for all). Conclusion: Pharmaceutical intervention could reduce the incidence rate of irrational use of antibiotics and the drug expense and shorten the course of antibiotics during the use of antibiotics in patients.

Keywords. pharmaceutical intervention, antibiotics, rational use.

Antibiotics with great varieties and different mechanisms of action have been widely used for the treatment of various diseases. As the varieties and number of antibiotics clinically used increase, the incidence rate of irrational use of antibiotics also increases, which affects the curative effect and even threatens the safety of drug use in patients [1]. Pharmaceutical intervention means that to achieve rational drug use, physicians strictly follow the drug use system of various kinds of drugs, finds out irrational drug use and possible unsafe factors during drug use in time, and rapidly takes effective measures to ensure the rationality and safety of drug use [2]. This paper discussed the role of pharmaceutical intervention in promoting the rational use of antibiotics in hospitals. Details are reported as follows:

1. Clinical data and methods

1.1. Clinical data

A total of 840 patients treated with antibiotics in our hospital from January 2017 to January 2019 were selected and divided into the experimental group and the control group by random number expression, with 420 in each group.

1.1.1. Inclusion criteria: all enrolled cases were able to take drugs in strict accordance with medical device, had complete clinical data, were informed of the study and volunteered to participate in the study.

1.1.2. Exclusion criteria: patients with severe injuries in important organs such as heart, liver and kidney; patients with mental disorders and failing to follow medical advice; patients treated with antibiotics within the last one month of the study.

1.2. Methods

Patients in both groups were given antibiotics treatment according to their basic data, of which the control group was informed of the dosage and usage of various drugs, and the experimental group was given pharmaceutical intervention. The content is as follows:

1.2.1. A pharmaceutical intervention group was established: the pharmaceutical intervention group, which was composed of pharmacists with more than 5 years of work experience from the Pharmacy Department of our hospital, was mainly responsible for the pharmaceutical intervention of antibiotics. Before intervention, group members were organized to carry out training on the varieties of antibiotics, mechanisms of action, common adverse reactions of different varieties of antibiotics and treatment measures; assessment was carried out after training, and those passing the assessment could participate in the pharmaceutical intervention.

1.2.2. Pharmaceutical intervention was implemented. 1) Drug knowledge education activities were carried out regularly: pharmacists with strong professional ability and rich work experience were arranged to serve as lecturers to introduce the importance of rational use of antibiotics and basic knowledge of antibiotics to patients, including methods of taking antibiotics, drug course, possible adverse reactions (ADR) and so on. 2) Special monitoring of antibiotics was strengthened. Pharmacists should separately list the hospital antibiotics to be extensively monitored, monitor cases with drug contraindications in terms of drug duration, drug sequence, drug compatibility, dose rate and other aspects, and put forward suggestions for clinical drug use [3]. 3) Assistance was rendered to physicians in ward rounds. The

pharmaceutical intervention group should assist physicians regularly to make the rounds of the ICU, Respiratory Medicine Department, Neurosurgery Department, Pediatric Department and other departments, actively spread relevant knowledge of antibiotics in patients and remind them of the importance of safe drug use during ward rounds, and carefully review the antibiotic prescriptions issued for hospitalization and clinics to determine the dosage and frequency of different varieties of antibiotics, mainly the special antibiotics. 4) Antibiotics were managed in a hierarchical manner. The pharmaceutical intervention group should perform hierarchical management based on the application of antibiotics in our hospital, that is, to develop corresponding permissions and regulations for different levels of antibiotics. For example, antibiotics for unrestricted use could be used rationally by clinicians according to patients' conditions; those for restricted use should be signed by attending physicians and above according to patients' conditions before use; those for special use could be used only when patients had strict indications or concrete basis for drug use, consultation was carried out by experts, and prescriptions were signed by associate chief physicians and chief physicians, thus ensuring the rational use of various antibiotics. 5) Drug use was continuously monitored. According to the application of antibiotics in our hospital, the ADR was found to be common, which not only affected the efficacy of drugs, but also threatened the health of patients. Therefore, pharmacists must monitor the drug use in patients. Skin test should be performed before use. If allergy occurred, such antibiotics should be prohibited to ensure the rational drug use. Patients with a high probability of ADR during the use of antibiotics should be mainly monitored, and the antibiotics must be discontinued once ADR was found [4].

1.3. Observation indicators

The incidence rate of irrational use of antibiotics, combination of antibiotics, drug expense and drug duration were compared between the two groups.

1.4. Statistical methods

In this study, statistical analysis of data was carried out using SPSS21.0 data statistical software, where n represents the cases of patients; measurement data and enumeration data were expressed by mean and percentage, and tested by t -test and chi-square test. $P < 0.05$ was considered significant differences between the statistical data.

2. Results

2.1. Comparison of general data between the two groups

General data of the two groups are shown in Table 1. The statistical analysis showed that there was no significant differences in the general data between the two groups ($P > 0.05$) (Table 1).

Table 1. Comparison of general data between the two groups n (%)

General data	Experimental group	Control group	χ^2/t	p
Case	420	420	0	>0.05
Gender (male/female)	230/190	240/180	0.271	>0.05
Average age (year)	73.25±4.35	73.26±4.31	0.107	>0.05
Respiratory Medicine Department	160	165	0.125	>0.05
Neurosurgery Department	130	130	0	>0.05
Pediatric Department	100	90	0.680	>0.05
ICU	30	35	0.417	>0.05

2.2. Incidence rate of irrational use of antibiotics in the two groups

The statistical results showed that the incidence rate of irrational use of antibiotics (5%) in the experimental group was lower than that (25.95%) in the control group, and the statistical analysis showed that there was no significant difference between the two groups ($P < 0.05$) (Table 2).

2.3. Comparison of combination of antibiotics, drug expense and drug duration between the two groups

The statistical results showed that the proportion of combination of antibiotics in the experimental group was higher than that in the control group, the drug expenses was lower than that in the control group, and the duration of antibiotics was shorter than that in the control group, and the statistical analysis showed that the differences were significant ($P < 0.05$) (Table 3).

Table 2. Analysis of the irrational use of antibiotics in the two groups n (%)

Group	n	Improper drug selection	Improper usage and dosage	Irrational combination	Medication without indications	Frequent change of drugs	Total
Experimental group	420	5 (1.19)	6 (1.43)	4 (0.95)	2 (0.48)	4 (0.95)	21 (5)
Control group	420	30 (7.14)	25 (5.95)	21 (5)	13 (3.09)	20 (4.76)	109 (25.95)

Table 3. Comparison of combination of antibiotics, drug expense and drug duration between the two groups

Group	n	Combination of antibiotics	Drug expense (yuan)	Drug duration (d)
Experimental group	420	401 (95.48%)	115.36±11.25	3.24±0.54
Control group	420	320 (79.19%)	264.35±21.31	5.24±0.68

3. Discussion

Antibiotics play a positive role in the treatment and prevention of diseases and have important value in safeguarding people's health and safety. All drugs must be clinically used in a scientific, rational and correct manner, or various adverse reactions may occur, which not only is effective to patients' conditions, but also may threaten their health and safety. Particularly, the clinical application of antibiotics has attracted much attention in social and medical fiends in recent years. Many studies at home and abroad suggest that the clinical abuse of antibiotics is common; people did not realize the harm of such phenomenon in the early stage, but with the progress of medical technology, medical institutions turned their attention to the rational use of antibiotics; irrational use of antibiotics not only affects the prevention and treatment of diseases, but also may cause various adverse reactions. Therefore, many policies, measures and methods have been issued in China and foreign countries to standardize the use of antibiotics, which is effective and reduces the abuse of antibiotics to some extent. However, the clinical irrational use of antibiotics persists. We need to further strengthen studies, discussions, and practice to improve the rationality of clinical use of antibiotics [5].

In recent years, the abuse of antibiotics has attracted extensive attention from all walks of life with the wide clinical use of the drugs. The reasons for the abuse of antibiotics can be summarized as the following aspects. 1) In terms of the society: the growing variety of antibiotics leads to vicious competition in the market, and thus some antibiotics of poor quality are put into medical institutions. 2) In terms of hospital management: drug income occupies a high proportion in hospital income, and some hospital managers, driven by the profit and have weak awareness of rational drug use, lead to excessive consumption and waste of medical resources. 3) In terms of pharmacists: pharmacists, with a lack of clinical knowledge and complete knowledge structure, inadequately monitor adverse drug reactions and drug-induced diseases, and do not explain the nature, usage and contraindications of drugs to patients. 4) In terms of patients themselves: patients have little knowledge about the antibacterial effect of antibiotics and have bad drug use habits. Therefore, it is important to standardize the use of antibiotics and enhance the clinical rational drug use. Pharmaceutical intervention, as a basic responsibility of the Pharmacy Department, means that pharmacists monitor the standardization and appropriateness of prescriptions, and it can help ensure the rational use of antibiotics and improve the effectiveness and safety of clinical use of antibiotics [6]. In this paper, 420 patients treated with antibiotics, who were given pharmaceutical intervention, were compared to those that were not given pharmaceutical intervention, and the results showed that pharmaceutical intervention could reduce the incidence rate of irrational drug use, increase the proportion of drug combination, reduce the drug expense and shorten the drug duration. This is mainly because pharmaceutical intervention is implemented from various aspects, including drug publicization and education, enhanced review of prescriptions, assistance with physicians in ward rounds, hierarchical management of antibiotics, and continuous supervision of drug use, thereby supervising all links of antibiotics and comprehensively improving the rationality of the use of antibiotics.

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