

Original Article

Efficacy and safety compare of two antibiotics combined with Chinese patent medicine for chronic suppurative otitis media in children

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Abstract: Objective: We conducted a study to compare the efficacy and safety of two antibiotics in combination with Chinese patent medicine for chronic suppurative otitis media in children so as to provide data for the selection of clinical drugs. Method: 99 child patients with chronic suppurative otitis media who were selected for this study were randomly divided into two study groups, observation group and control group, according to visiting sequence. After Erlong capsule administration, azithromycin and erythromycin were administered for the above two groups, respectively. After one-month continuous treatment, comparison was conducted between groups on clinical data, such as clinical efficacy, safety, compliance rate of administration, recurrence rate during the follow-up, and a statistical analysis was performed. Results: The total effective rate of the two groups was 92.0% and 81.6%, respectively, and total effective rate of the observation group was significantly higher compared to the control group ($P < 0.05$). The incidence rate of adverse reactions among the two groups was 18.0% and 28.6% respectively, and the incidence rate of the observation group was significantly lower compared to the control group ($P < 0.05$). In other words, safety in the observation group was significantly higher compared to the control group. Moreover, the observation group was significantly superior to the control group in terms of both compliance rate of administration and recurrence rate during the follow-up ($P < 0.05$). Conclusion: Azithromycin dry suspension in combination with Chinese patent medicine for chronic suppurative otitis media in children is safe and effective, which has greater compliance and lower recurrence rate, worthy for clinical promotion.

Keywords: Children, chronic suppurative otitis media, antibiotics, Chinese patent medicine, clinical value

Introduction

Chronic suppurative otitis media mainly presents with continuous suppuration in auditory meatus, which not only influences hearing but may also lead to headache, earache, dizziness, facioplegia and meningitis, etc., seriously affecting the life quality of patients. Domestic census data show that the incidence of chronic suppurative otitis media in children reaches up to 4.3% and it has already become a common disease affecting children development [1]. Thus, study on its treatment and the relevant data is clinically valuable. Although the efficacy of oral antibiotics which are used clinically at present is improved as the improvement of bacterial culture technology, they cannot meet clinical needs yet due to the influence of factors such as bacterial resistance, concomitant dis-

ease, etc. The therapy of antibiotics in combination with Chinese patent medicine has a great clinical efficacy, but it is not used widely due to less application and no unanimous conclusion for antibiotics use [2]. The present study aimed at confirming the clinical value of the above therapy and providing data support for antibiotics selection and promotion of the above therapy. The study process and results are illustrated as follows.

Subjects and methods

Subjects

99 children patients suffering from chronic suppurative otitis media who received internal medicine treatment between June 2012 and June 2013 were included the present study.

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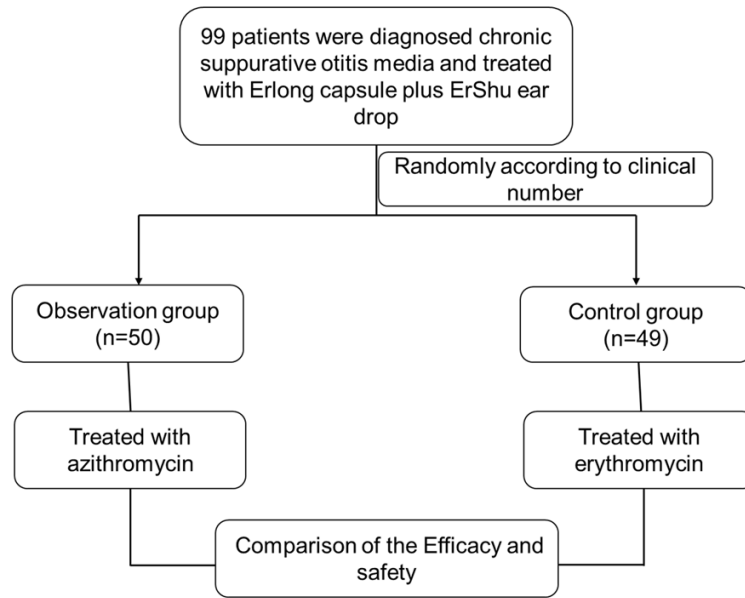


Figure 1. The flow chart for patient recruitment and administration.

Table 1. The clinical data between the two groups

Groups	n	Sex (M/f)	Age (Year)	Disease course (month)	WBC (*10 ⁹)
Observation group	50	28/22	3.8±2.2	8.6±3.3	8.8
Control group	49	26/23	4.3±1.6	8.5±3.4	8.6
P		>0.05	>0.05	>0.05	>0.05

These 99 patients were divided into two groups according to the clinical sequence. The flow chart for patient recruitment and administration was shown in **Figure 1**.

Inclusion and exclusion criteria

In order to improve research safety, data scientific and repeatability of operation methods, the following specific selection criteria were formulated for the study. (1) Inclusion criteria: 1) Patients who were confirmed of chronic suppurative otitis media upon comprehensive diagnosis by traditional Chinese medicine and western medicine; 2) Those who were less than 6 years old; 3) Those who accepted drug therapy without history of allergy to the drugs used in this study [3]; 4) The parents known about the study risks and values with voluntary participation; 5) All the requirements of the Medical Ethics Association concerning the study were met [4]. (2) Exclusion criteria: 1) Patients who had taken hormone drugs within 15 days before the study and those who taken hormone drugs

during the study; 2) Those who were also suffering from organic diseases in ear and head and associated diseases which affected evaluation of the study efficacy [5]; 3) Patients who were also suffering from severe internal medicine diseases or those with weak immune systems; 4) Patients who had changed drugs or treatment method on the way of the study or lost follow-up, resulting in the lack of clinical data [6].

General information

(1) Observation group: 50 cases, among which there were 28 males and 22 females, and their age ranged from 2 to 6 years, (3.8±2.2) years on average. The course ranged from 2 to 12 months, (8.6±3.3) months on average; (2) Control group: 49 cases, among which there were 26 males and 23 females, and the age ranged from 1.5 to 6 years, (4.3±1.6) years on

average. The course ranged from 3 to 11 months, (8.5±3.4) months on average. Comparison was performed between groups in terms of the above data, and the results showed no significant differences (P>0.05).

Treatment method

All subjects orally administrated an Erlong capsule manufactured by Tangshan Jingzhongshan Pharmaceutical Co., Ltd, with the national medicine permission number (NMPN) of Z20030026 and specification of 0.42 g per pill as well as batch number of 20120301, two pills per time, three times per day. They also received an ear dropping treatment with an ErShu ear drop manufactured by QINKUN Biomedical engineering co., LTD, with the approval number of SHANWEIXIAOZHENGZI No. 0191 and specification of 8 ml as well as batch number of 20120203, 2 to 3 drops per time, three times per day. Corresponding antibiotics were provided on the basis of the above treatment among different groups.

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Table 2. Comparison of clinical efficacy between two groups

Group (n)	Cure	Excellent	Effective	Ineffective	Total effective rate (%)
Observation group (50)	28	12	6	4	92.0
Control group (49)	22	13	5	9	81.6
χ^2					3.986
P					0.048<0.05

Treatment in observation group

The subjects in the observation group were given azithromycin. Azithromycin dry suspension which was manufactured by Ouyi Pharma of China Shijiazhuang Pharmaceutical Group Co., Ltd, with NMPN of H10980217 and specification of 0.1 g per bag as well as batch number of 20120503, was taken at a draught, 10 mg/kg based on body weight on the first day and 5 mg/kg based on body weight starting from the second day. Further administration was provided every two days after one-week continuous administration, and the dose was adjusted according to severity and efficacy.

Treatment in control group

Subjects in the control group were given erythromycin. Erythromycin Ethylsuccinate Granules (manufactured by Chongqing KERUI Pharmaceutical Group Co., Ltd.; NMPN: H05202072; specification: 10 mg per bag; batch number: 20120401) was administered orally after meals, 7.5-12.5 mg/kg per time based on body weight, 4 times per day. In the case of severe infection, the above dose was doubled. Further administration was provided every two days after one-week continuous administration. Efficacy evaluation was performed after 30-day treatment.

Evaluation items and standards

The following evaluation standards were formulated to improve accuracy and scientific in comparison of the study data. (1) Efficacy: 1) Cure: Complete disappearance of clinical symptoms, recovery of normal hearing by self-examination, recovery of pure tone audiometric thresholds above 20 dB, and normal eardrum by otoscopy. 2) Excellent: Remarkable improvement in both symptoms and hearing by self-examination, recovery of pure tone audiometric thresholds above 10 dB, and remarkable improvement in eardrum by otoscopy. 3) Effective: Improvement

in symptoms, eardrum and hearing by self-examination, failing to reach an excellent level, and recovery of pure tone audiometric thresholds above 5 dB. 4) Ineffective: No improvement or aggravation in symptoms, eardrum and

hearing by self-examination, and recovery of pure tone audiometric thresholds below 5 dB [7]. Total effective rate = number of (cure + excellent + effective) patients/number of patients enrolled in the study *100%. (2) Safety: Count the number of patients who showed adverse reactions during treatment, and calculate its incidence. Incidence of adverse reactions was negatively correlated with safety [8]. (3) Compliance rate of administration: Grades of questionnaires filled by patients' parents were used as the evaluation index of compliance rate. Grades above 60 were regarded as compliance, and grades below 60 were regarded as non-compliance [9]. Compliance rate was calculated for the comparison between groups. (4) Recurrence rate: A 2-year follow-up was performed. Count the number of cases with recurrence among the cured cases at month 3, month 6, month 12, month 18, and month 24, respectively, and calculate the recurrence rate.

Data processing method

SPSS18.2 software was employed for statistical analysis on the study data. Measurement data were represented as Mean \pm s and t test. Count data were compared using χ^2 test. P<0.05 indicated significant difference between groups.

Results

Clinical data comparison between the two groups

As shown in **Table 1**, there were not significant differences between these two groups in general clinical data.

Efficacy

Patients in the two groups were evaluated and counted, respectively, according to efficacy evaluation criteria. The total effective rate in

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Table 3. Comparison of adverse reactions between two groups

Group (n)	Acrtia	Emesis	Fever	Rash	Jaundice	Others	Incidence of adverse reactions (%)
Observation group (50)	1	3	2	1	0	2	18.0
Control group (49)	3	2	2	2	3	0	28.6
χ^2							5.834
P							0.028

Table 4. Comparison of administration compliance between two groups

Group (n)	90-100	80-90	70-80	60-70	<60	Compliance rate of administration (%)
Observation group (50)	13	10	15	9	3	94.0
Control group (49)	10	12	9	11	7	85.7
χ^2						4.269
P						0.042

Table 5. Comparison of recurrence rate between two groups

Group (n)	Month 3	Month 6	Month 12	Month 18	Month 24
Observation group (n=50)	4.0 (2)	6.0 (3)	10.0 (5)	16.0 (8)	22.0 (11)
Control group (n=49)	12.2 (6)	16.4(8)	24.4 (12)	28.4 (14)	40.8 (20)
χ^2	4.362	4.582	5.234	3.886	4.462
P	0.052	0.038	0.032	0.048	0.040

the observation group and control group was 92.0% and 81.6%, respectively, with significant difference ($P < 0.05$). The detailed data are listed in **Table 2**.

Safety

No patients experienced severe adverse reactions during treatment, and only a small number of patients experienced mild adverse reactions. They recovered after symptomatic treatment, and the study process was not affected. Incidence of adverse reactions in the observation group and control group was 18.0% and 28.6%, respectively, with significant difference ($P < 0.05$). In other words, safety in the observation group was significantly superior compared to the control group. The detailed data are listed in **Table 3**.

Compliance with administration

Compliance rate of administration in the two groups was 94.0% and 85.7%, respectively. A noticeable advantage of the observation group ($P < 0.05$) was shown. The detailed data are listed in **Table 4**.

Recurrence rate

In terms of comparison about recurrence rate at month 3, month 6, month 12, month 18 and

month 24, the recurrence rate at each time point in the observation group was significantly lower than that in the control group ($P < 0.05$). The detailed data are listed in **Table 5**.

Discussion

Chronic suppurative otitis media among children not only affects hearing but also causes multiple complications, affecting children development and further affecting life quality of the whole family. Moreover, children are unfit for surgery but a higher requirement of administration is also present due to physiological properties [10]. Thus, study on its treatment and clinical value is significant for disease treatment, rational administration and children growth and development. Antibiotics in combination with Chinese patent medicine are often used clinically at present, which remarkably improve efficacy. But a unanimous conclusion on antibiotics selection is lacked and there is no related study [11]. Thus, the present study is not only clinically valuable but also innovative.

As advances in bacterial culture technology and pathology study, there is a deeper understanding about otitis media and further improvement in its clinical efficacy. However, there is still a big gap between doctor and

patient requirements. Furthermore, pure antibiotic treatment not only has obvious side effects but also shows a reduction trend in efficacy [12] as the increase of tolerance. A therapy of antibiotics in combination with Chinese patent medicine which is adopted clinically at present using ear drops for external treatment as well as orally taken patent medicine can not only rapidly improve clinical symptoms but also shorten administration time. The amount of antibiotics is reduced and adverse reactions are also decreased during treatment. In addition, Chinese medicine provides treatment towards the nature of disease, which reduces recurrence rate and further improves the long-time efficacy. Although the value of the above therapy has already been confirmed in clinics and the related studies, there are few studies on the type of antibiotics and no unanimous conclusion reached [13].

The present study aimed at providing reference for clinical selection of antibiotics. In order to conduct a comparative study on the relevant data, the patients with chronic suppurative otitis media were selected as the subjects, and different antibiotics in combination with Chinese patent medicine were used in different groups. The results showed that the group treated with azithromycin dry suspension was significantly superior to the group treated with Erythromycin Ethylsuccinate Granules in terms of efficacy, safety, compliance and recurrence rate during the 2-year follow-up ($P < 0.05$), confirming the clinical value of azithromycin dry suspension in combination with Chinese patent medicine for chronic suppurative otitis media in children. On the basis of the related studies, recurrence rate during a 2-year follow-up was compared in the study, significant for long-time efficacy evaluation of drugs. Guidance value and novelty of the study were enhanced and study development was directed. The recurrence rate at month 24 among the two groups reached up to 39.3% and 45.5%, respectively, which was relatively higher. The data difference was mainly related to less patients and involvement of the cured patients only in the study. Meanwhile, it should also be pointed out that a further expansion of the study scope and number of patients are required so as to complete the relevant data. In the study, the total effective rate in the observation group reached up to

92.0%, and the compliance rate of administration reached 94.0%, both of which were significantly higher than those of the related study [14, 15], further providing data support for the promotion of azithromycin dry suspension in combination with Chinese patent medicine for chronic suppurative otitis media in children. Thus, the data and conclusion of the present study are scientific, which are significant for guiding clinical practice.

In summary, azithromycin dry suspension in combination with Chinese patent medicine for chronic suppurative otitis media in children is safe and effective. It has great compliance and low recurrence rate, worthy popularization.

Disclosure of conflict of interest

None.

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