Effect of azithromycin and pefloxacin in treatment of acute enteritis based on clinical efficacy comparison

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Abstract: This paper aims to compare and analyze clinical efficacy of azithromycin and pefloxacin in treatment of acute enteritis. The 160 patients with acute enteritis were randomly divided into a study group (n=80) treated with azithromycin, and a reference group (n=80) treated with pefloxacin. We compared overall treatment efficiency (markedly, effective, invalid), clinical symptoms and signs remission time (antipyretic time, antidiarrheal time, symptoms and signs disappearance time), interleukin-6 and C-reactive protein concentration before and after treatment, adverse reactions rate (nausea, abdominal pain, headache, etc.). In comparison of overall treatment efficiency of the two groups, the results showed that the study group was significantly superior to the reference group ($P<0.05$). In comparison of clinical symptoms and signs remission time of the two groups, the study group were significantly shorter than the reference group ($P<0.05$). At the same time, in comparison of levels of interleukin-6 and C-reactive protein concentration after treatment, the study group was significantly superior to the reference group ($P<0.05$). There was no significant difference between the two groups in incidence of adverse reactions ($P<0.05$). The efficacy of azithromycin for acute enteritis is better than that of pefloxacin, and it can significantly reduce clinical symptom remission time. Moreover, safe and reliable, it has great value in clinical application.

Keywords: Azithromycin, pefloxacin, acute enteritis, therapeutic effect, comparative analysis.

INTRODUCTION

The changing lifestyle, people's diet has undergone a corresponding change, which leads to increased incidence of enteritis. Especially in the summer and autumn, the incidence of acute enteritis is higher, and according to statistics, the incubation period is about 12h-36h (Wang, 2016). There are many clinical symptoms of acute enteritis, the most common of which are abdominal distension, abdominal pain or diarrhea, nausea and vomiting, causing varying degrees of impact on patients' normal quality of life and work (Cahill *et al.,*2015; Cahill *et al.,*2015).

Acute enteritis is a common disease in digestive system. There are a variety of bacterial infections causing the disease, such as ECHO virus (fig. 1), Coxsackie virus (fig. 2), intestinal candida (fig. 3), etc. Moreover, some people have the disease because of drug, chemical poisoning or unsanitary food intake etc (Wang, 2013). If not timely and effectively treated, acute enteritis can lead to dehydration, shock symptoms, and even pose a serious threat to patients' lives (Dobs *et al.,* 2015). Antimicrobial drugs are mainly adopted in current treatment of acute enteritis, and treatment with fluoroquinolone antibacterials will easily lead to renal insufficiency or drug resistance, etc. making the effect unsatisfactory (Wang, 2014). Studies have shown that azithromycin has advantages of broad antimicrobial spectrum, strong antibacterial activity and less adverse reactions, etc., which makes it the first choice in treatment of acute enteritis (Luo, 2015). In view of this, this study takes comparative analysis to observe efficacy of azithromycin and pefloxacin in treatment of acute enteritis, and the detailed report is as follows.

MATERIALS AND METHODS

This study was conducted among 160 patients with acute enteritis treated in our hospital. All projects were approved by the ethics committee of the hospital, signed with informed consent. Ethical Approval number as 2014PT5SQ. All of them were diagnosed by clinical examination (laboratory examination, blood routine examination, etc.). The treatment time was from October 2014 to October 2016. The patients' main clinical manifestations included nausea, vomiting, abdominal pain and diarrhea. All subjects were entitled to the right to know the treatment, and signed informed consent. The patients were randomly divided into a study group and a reference group, each with 80 cases. The study group consisted of 45 men and 35 women aged between 22 and 64 years (44.8±3.6 years), whereas the reference group was comprised of 42 men and 38 women aged 23 to 65 years (42.7±2.5 years). In comparison of relevant information of the two groups, the results showed comparability ($P>0.05$).

Methods

The study group and the reference group were treated with conventional treatment, including vomit-stopping,

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fluid infusion, balance of water and electrolyte disorders, gastric spasm relief etc. Furthermore, scientific diet programs were developed for patients for the sake of antisecosis. On this basis, the reference group was treated with pefloxacin: take pefloxacin injection of 0.4g in specification, to be added into 250mL glucose injection (5%) for intravenous infusion, once a day with continuous treatment for 5 days. The study group was treated with azithromycin: take azithromycin injection of 0.5g in specification, to be added into 250mL sodium chloride injection (0.9%), for intravenous infusion, once a day with continuous treatment for 5 days. In the treatment period, statistics of the patients' stool frequency, nature and blood routine examination results were made, and patients' diet and mental state were observed (Dobson, 2015).

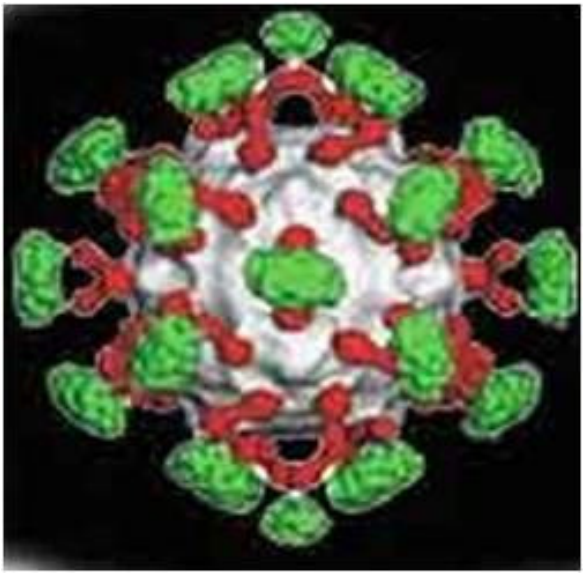

Fig. 1: ECHO virus (reference to Wang, 2016)

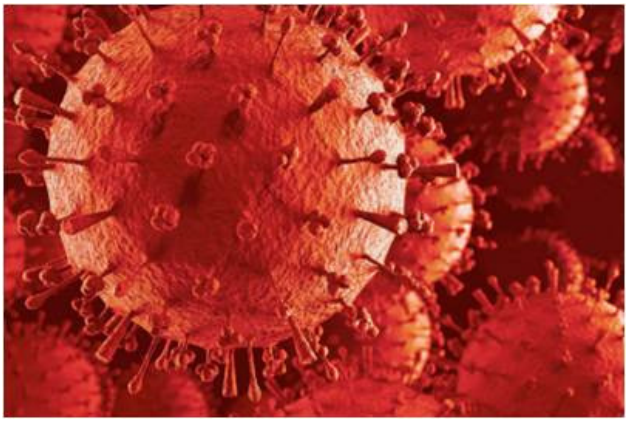

Fig. 2: Coxsackie virus (reference to Wang, 2016)

Observation indicators

The overall treatment efficiency in the two groups was evaluated by three criteria: markedly, effective and invalid. According to the standard of "Criteria for Judgment of Therapeutic Effect of Acute Diarrheal Diseases" developed by Chinese Diarrheal Disease Prevention and Treatment Symposium, after 3 days of treatment, if patient's stool frequency and nature return to normal state, accompanying symptoms disappear, laboratory test results show normal, it is markedly (Luo, 2015). After 3 days of treatment, if the patient's stool frequency and nature show a significant improvement, accompanying symptoms decrease, while laboratory tests show significantly lower white blood cell, pus and red blood cell counts, it is effective. After 3 days of treatment, if there is no significant change in the above indicators compared with the situation before treatment, meanwhile white blood cell, pus and red blood cell count increase, it is invalid; In addition, clinical symptoms and signs remission time of the two groups after treatment was recorded and compared, including antipyretic time, antidiarrheal time, disappearance time of symptoms and signs. The changes of interleukin-6 were measured by ELISA before and after treatment, and immunoturbidimetry was taken for statistics of C-reactive protein concentration changes before and after treatment (Zhu, 2015); statistics of incidence of adverse reactions in patients was made.

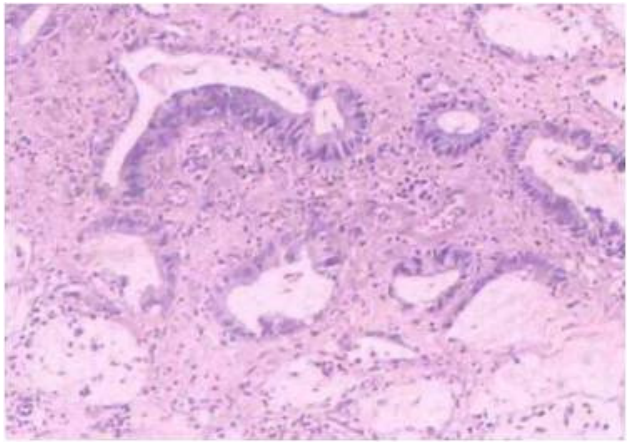

Fig. 3: Intestinal candida

STATISTICAL ANALYSIS

The measurement data were expressed as ($\overline{x}$ ± s), and count data were expressed as (n, %). Comparison between the groups was tested by t-test and chi-square. SPSS21.0 statistical software was employed for data processing. If $P < 0.05$, there exists a statistical significance.

RESULTS

Comparison of overall treatment efficiency of the two groups

As shown in table 1, overall efficacy was better in the study group than in the reference group ($P < 0.05$).

Comparison of clinical symptoms and signs remission time of the two groups after treatment

As shown in table 2, clinical symptoms and signs remission time in the study group is significantly less than

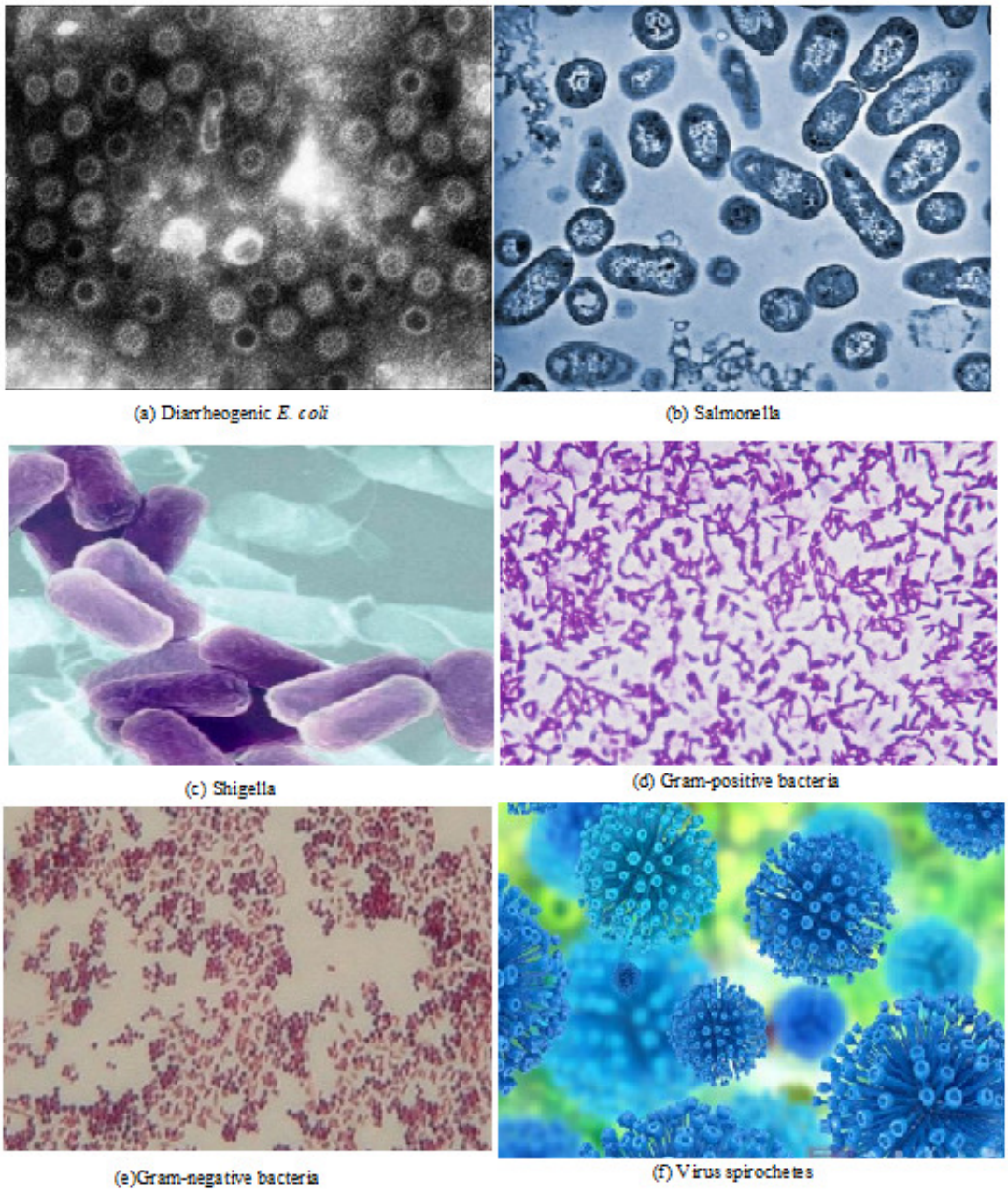

Fig. 4: Different bacteria classification

that in the reference group after treatment with different regimens (P <0.05).

Comparison of interleukin-6 and C-reactive protein concentration changes before and after treatment

As shown in table 3, by contrasting interleukin-6 and C-reactive protein concentration changes after treatment, the results shows that concentration of inflammatory factors in the study group decreased more significantly.

Comparison of incidence of adverse reactions in the two groups

In statistics of adverse reactions, the results showed that both the study group and the reference group had adverse reactions, the symptoms were mild which disappeared without special treatment. There was no significant difference between the two groups, and there existed no statistical significance (P <0.05), as shown in table 4.

DISCUSSION

As a common clinical digestive system disease, acute enteritis is mainly caused by bacteria or viral infection. As patients have sudden onset in a short period of time, there are a variety of complications (Cahill *et al.,* 2015; Cahill *et al.,* 2015). During treatment of this disease, combination therapy is usually taken, which means diethyl antibiotic probiotics combined with gastric

Table 1: Comparison of overall treatment efficiency of the two groups[n (%)]

Group	Markedly	Effective	Invalid	Overall treatment efficiency
Study group(n=80)	56(70.00)	22(27.50)	2(2.50)	78(98.50)
Reference group(n=80)	35(43.75)	33(41.25)	12(15.00)	68(85.00)
X^2				12.65
P				<0.05

Table 2: Comparison of clinical symptoms and signs remission time of the two groups after treatment ($\overline{x}$ ± s)

Group	Antipyretic time (h)	Antidiarrheal time (h)	Symptoms and signs disappearance time (h)
Study group(n=80)	22.83±2.15	36.08±2.21	56.72±1.45
Reference group(n=80)	30.69±4.82	42.16±3.35	65.78±2.21
t	10.69	12.75	9.37
P	<0.05	<0.05	<0.05

Table 3: Comparison of interleukin-6 and C-reactive protein concentration changes before and after treatment ($\overline{x}$ ± s)

Group	Interleukin-6 (ng/L)		C-reactive protein concentration (mg/L)	
	Before treatment	After treatment	Before treatment	After treatment
Study group(n=80)	155.35±11.23	50.39±6.75	14.39±2.15	1.34±0.69
Reference group(n=80)	154.68±11.28	90.74±8.12	14.28±2.06	6.58±1.50
t	0.13	20.68	0.25	18.39
P	>0.05	<0.05	>0.05	<0.05

Table 4: Comparison of incidence of adverse reactions in the two groups [n(%)]

Group	Nausea	Vomiting	Arthralgia	Abdominal pain	Headache	Incidence of adverse reactios
Study group (n=80)	2(2.50)	1(1.25)	0(0.00)	1(1.25)	0(0.00)	4(5.00)
Reference group(n=80)	2(2.50)	2(2.50)	1(1.25)	0(0.00)	1(1.25)	6(7.50)
X^2						0.15
P						>0.05

membrane protective agent in treatment (Ghoneum, 2015). At the same time, acute enteritis in patients is bacterial diarrhea caused by diarrheogenic *Escherichia coli* (shown in fig. 4a), Salmonella (shown in fig. 4b) and Shigella (shown in fig. 4c). Usually, fluoroquinolones antibiotic drugs are adopted for its treatment, such as pefloxacin. However, clinical practice and treatment experience have shown that fluoroquinolones antibiotic drugs can cause serious drug resistance or adverse reactions for minors, patients with liver and kidney dysfunction, so the effect is not ideal (Abu, 2017; Fang and Ruan, 2017; Liu *et al.* 2017; Takahashi, 2017; Yung, 2015).

Azithromycin is the second generation of semi-synthesized fifteen major macrocyclic complex antibiotics, which can bind with sensitive micro-organisms 50s ribosomal subunit protein, effectively inhibit bacterial protein synthesis, thereby achieving bacteriostasis (Cahill, 2015). At the same time, azithromycin has a wide antimicrobial spectrum, which has strong antibacterial effect in bacterial infections caused by gram-positive bacteria (as shown in fig. 4d), gram-negative bacteria (shown in fig. 4e), and virus spirochete (as shown in fig. 4f). Meanwhile, application of azithromycin can significantly reduce adverse reactions, its metabolites can be eliminated in prototype through the biliary tract, and excreted in urine and stools, so there will be no liver and kidney damage and adverse reaction rate is reduced; in addition, Azithromycin can exert a faster effect in treatment of acute enteritis, a higher plasma concentration (0.4-0.5mg/L) can be maintained in the lesion, half-life period is 45h or so, bioavailability is 37%, time to peak is 2.5h. Therefore, it takes effect rapidly after medication and can relieve clinical symptoms in a short time.

The results of this study showed that in comparison of the study group treated with azithromycin and the reference group treated with pefloxacin, the former enjoys significant advantages in various indicators (P<0.05), and the curative effect is exact.

CONCLUSION

In summary, efficacy of azithromycin in treatment of acute enteritis is better than that of pefloxacin, which can significantly reduce clinical symptoms remission time, thus safe and reliable. Therefore, it enjoys great value in promotion and application of treatment.

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