

# Compound shuanghua tablets combined with Western medicine on serum and secretion inflammatory factors in patients with acute secretory otitis media caused by swimming

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**Abstract:** To observe and analyze the effect of compound shuanghua tablets combined with western medicine on serum and secretion inflammatory factors in patients with acute secretory otitis media caused by swimming. The 140 patients who had been treated in our hospital for acute secretory otitis media were selected as research objects, all of which were caused by swimming. The patients were divided into two groups, namely the control group accepting routine western drug therapy and the research group accepting compound shuanghua tablets combined with western drug therapy, each group contains 70 patients. The therapeutic effect of patients in two groups were observed and compared. Through observation, the levels of tumor necrosis factor, interleukin-6 and interleukin-10 were found to be significantly improved in the research group compared with the control group, and the intergroup difference was of statistical significance,  $p < 0.05$ ; The overall treatment efficiency of the research group was significantly higher than that of the control group, with statistical significance,  $p < 0.05$ . For patients with acute secretory otitis media caused by swimming, the compound shuanghua tablets combined with Western medicine treatment can not only actively reduce various inflammatory factors in middle ear effusion, but also significantly improve the overall treatment efficiency.

**Keywords:** Compound shuanghua table, combined western medicine, acute secretory otitis media, Serum and secretions, inflammatory factor.

## INTRODUCTION

Swimming is one of the sports that are popular in men and women, the old and the young. Swimming has many advantages, including improving cardiovascular system, lung capacity, respiratory system, muscle system, body temperature regulation, skin blood circulation and resistance. However, during the swimming, it is easy to have a variety of disease problems, including the common acute secretory otitis media disease.

Acute secretory otitis media (shown in the fig. 1 below) is a middle ear non-purulent inflammatory disease characterized by middle ear effusion and hearing loss, also called otitis media, non-suppurative otitis media, mucinous otitis media, catarrhal otitis media, middle ear effusion, serous otitis media, serous-mucus otitis media, aseptic otitis media, belonging one of the common diseases of ear, nose and throat (Wang, 2016; Shen, Weng, 2016; Oforikwaky, *et al.*, 2016). Secretory otitis media can lead to hearing loss, which should be given with highly vigilant and timely observation treatment. For adults with unilateral lesions, the etiology should be clarified as soon as possible, and the occupying tumors of nasopharynx and its surrounding space should be excluded, so as to relieve symptoms and improve life quality as soon as possible (Attari, *et al.*, 2016; Zhao, *et al.*, 2017). This paper investigates the effect of compound shuanghua tablets combined with western medicine on

serum and secretion inflammatory factors in patients with acute secretory otitis media caused by swimming.

## MATERIALS AND METHODS

### General data

In this study, 140 patients who had been treated in Qiqihar' hospital for acute secretory otitis media from May 2015 to June 2018 were selected as research objects, all of which were caused by swimming. This paper has a rigorous structure, and the conclusion has been approved by relevant ethics and relevant departments. The inclusion and exclusion criteria of patients are: patients with typical clinical symptoms, including stuffy feeling, tinnitus, earache, hearing loss, etc; tympanoscope or tympanoscope showed signs of tympanic room effusion, tympanic membrane hyperemia, entrapment or fluid level (as shown in fig. 2 below), with limited mobility and complete tympanic membrane (Ren, *et al.*, 2017); pure tone hearing threshold test is judged as conductive hearing loss, and the image of acoustic conductivity resistance is flat (B type) or high negative force (C type); no serious liver, kidney and heart disease; no lactating or pregnant women; no mental disorder.

The patients were randomly divided into control group and research group, each containing 70. There were 37 male and 33 female patients in the research group, with an average age of  $(43.6 \pm 0.9)$  years old and an average course of disease of  $(3.2 \pm 0.2)$  days. There were 36 male and 34

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female patients in the control group, with an average age of  $(42.8 \pm 1.3)$  years old and an average course of disease of  $(4.1 \pm 0.5)$  days. There was no significant difference in the general data of two group before treatment,  $p > 0.05$ .



Fig. 1: Acute secretory otitis media



Fig. 2: Acute secretory otitis media tympanic membrane



Fig. 3: Tympanic membrane before treatment

### Method

In the control group, only routine western medicine treatment measures was applied, that is, the patients were instructed to take cephalosporin antibiotics twice a day, one tablet at a time, for consecutive a week. Meanwhile, 0.5% hydroxymetazoline hydrochloride spray (produced by Yunnan Panlong Yunhai Pharmaceutical Co., Ltd., National Drug Standard H20113189) was applied twice a day.



Fig. 4: Tympanic membrane after treatment

On the basis of the same scheme as control group, the patients in the study group were treated with compound shuanghua tablets. That is, taking compound shuanghua tablets (manufactured by Shaanxi Kanghui Pharmaceutical Co., Ltd., with the National Drug Approval Number 90Z610992) for treatment, taking four tablets three times a day, for consecutive one week.

All the patients were examined after treatment, including pure tone test and acoustic impedance test. For the specimen collection and detection method: before and after treatment, peripheral venous blood was collected for implementation of EDTA anticoagulant, and then serum separation was conducted, finally stored at  $-80^{\circ}\text{C}$  for standby use. The middle ear effusion in the anterior lower quadrant of tympanic membrane was extracted under otoscope, and stored at  $-80^{\circ}\text{C}$  for standby use. Flow cytometry microsphere array was used to detect tumor necrosis factor, interleukin-6 and interleukin-10 levels in serum and middle ear effusion. The standard product and the sample to be tested (sample volume:  $50\mu\text{L}$ ) diluted by continuous multiple ratio were taken. The sample incubation was strictly performed according to the kit instruction. Flow cytometry and BDCBA software were used to analyze related data.

### Observational index

The overall treatment efficiency of the patients in both groups were observed and compared. In accordance with the clinical research guidance of secretory otitis media issued by the ministry of health, evaluation was carried out based on three criteria: significant effective, effective and ineffective. If the clinical symptoms of the patients disappear after treatment, the pattern of the acoustic impedance tympanum is type A, there is no abnormality in otoscopy, and the hearing is restored to normal, the standard of significant effectiveness is met. If clinical symptoms are improved after treatment, there is slight abnormality in otoscopy, type C of acoustic impedance tympanum is shown, and pure tone audiometric pneumatic bone conductance is reduced but not completely restored to normal, and hearing has been

restored, then the standard of effectiveness is met. After treatment, there is no difference, which is the standard of ineffectiveness (Moty, *et al.*, 2016; Hazra, *et al.*, 2015).

## STATISTICAL ANALYSIS

The statistical analysis software SPSS21.0 was used to process data. The measurement data were expressed by means of ( $\bar{x} \pm s$ ), with t used for intergroup comparison; the enumeration data were expressed by means of natural number (n) and percentage (%), with chi-square for intergroup comparison. When  $p < 0.05$ , the intergroup difference is considered of statistical significance.

## RESULTS

### *Comparison of levels of serum tumor necrosis factor, interleukin-6 and interleukin-10 between the two groups*

As shown in table 1 below, there was no significant difference in serum inflammatory factors between the two groups before treatment,  $p > 0.05$ . After treatment, the comparison results showed no significant differences,  $p > 0.05$ , the intergroup difference was of no statistical significance.

### *Comparison of levels of secretory tumor necrosis factor, interleukin-6 and interleukin-10 between the two groups*

As shown in table 2, there was no significant difference in the levels of secretory tumor necrosis factor, interleukin-6

and interleukin-10 between the two groups,  $p > 0.05$ . After taking different treatment methods, the improvement of research group was more significant than the reference group,  $p < 0.05$ .

### *Comparison of therapeutic effect between two groups*

As shown in table 3, the total effective rate of research group was higher than that of control group and the intergroup difference was of statistical significance,  $p < 0.05$ .

## DISCUSSION

Acute secretory otitis media is a common and frequently occurring disease in clinical practice. Some patients with protracted course of disease may be suffer adhesive otitis media, tympanic room sclerosis and other serious consequences, resulting in hearing loss (Liu, *et al.*, 2017; Wroblewska, *et al.*, 2015). In the treatment of this disease, the western medicine treatment program is one of the important measures. The main method is to inhibit the mucus secretion using antibiotics anti-inflammation, hydroxyazoline hydrochloride, ambroxol hydrochloride, and nasal astringents. Although the treatment with western medicine can achieve good results, the curative effect of patients is not uniform, or the expected effect cannot be achieved.

From the perspective of Chinese medicine, acute secretory otitis is characterized by "tinnitus", "distending

**Table 1:** Comparison of levels of serum tumor necrosis factor, interleukin-6 and interleukin-10 between the two groups ( $\bar{x} \pm s$ )

Group	Time	Serum tumor necrosis factor (pg/ml)	Interleukin-6 (pg/ml)	Interleukin-10 (pg/ml)
Research group	Before treatment	2.75±1.07	4.48±1.78	8.88±4.90
	After treatment	2.80±1.12	4.76±1.15	8.15±4.07
Control group	Before treatment	2.68±1.35	4.55±1.94	8.96±2.96
	After treatment	2.33±1.90	4.97±2.62	8.79±2.11

**Table 2:** Comparison of the levels of secretory tumor necrosis factor, interleukin-6 and interleukin-10 between the two groups ( $\bar{x} \pm s$ )

Group	Time	Secretory tumor necrosis factor (pg/ml)	Interleukin-6 (pg/ml)	Interleukin-10 (pg/ml)
Research group	Before treatment	4.70±1.73	148.84±55.68	68.70±10.23
	After treatment	2.02±1.06	3.76±0.68	4.12±1.29
Control group	Before treatment	4.90±1.83	149.58±44.67	65.95±12.66
	After treatment	3.95±0.86	23.90±9.67	11.80±2.09

**Table 3:** Comparison of therapeutic effect between two groups [n(%)]

Group	Significant effective	Effective	Ineffective	Total effective rate
Research group (n=70)	45	22	3	67(95.71)
Control group (n=70)	30	28	12	58(82.85)
$\chi^2$				9.83
p				<0.05

pain ear" and "sudden deafness". The ear is only a symptom, the real cause is the lung. In the treatment of this disease, the combination of Chinese and western medicine has been an important measure, and the results obtained are significantly superior to that by single western medicine treatment. In this study, patients in the study group were treated with compound shuanghua tablets, which is a Chinese patent medicine made by modern technology, consisting of honeysuckle, banlangen and forsythia, etc. These traditional Chinese medicines have the function of clearing heat and detoxifying. At the same time, the andrographis paniculata contained in compound shuanghua tablets has the function of clearing lung and detoxification effect. Modern pharmacological studies have shown that the extracts of several herbs in compound shuanghua tablets have strong bactericidal efficacy, good anti-virus and anti-inflammatory effects, and the antibacterial effect in vivo and in vitro is relatively outstanding.

The results showed that after treatment, the levels of tumor necrosis factor, interleukin-6 and interleukin-10 in research group were higher than those in control group,  $p < 0.05$ , indicating statistical significance. The total effective rate in research group was significant higher than that in control group,  $p < 0.05$ . This shows the effectiveness of compound shuanghua tablets combined with western medicine in treating patients with acute secretory otitis media caused by swimming, which is consistent with related research results.

## CONCLUSION

In conclusion, compound shuanghua tablets, as a national protected traditional medicine, mainly consists of honeysuckle, andrographis, forsythia, *Radix isatidis* and isatis root, which have the effects of heat clearing and detoxification, anti-disease and anti-swelling, and can produce good treatment effect for acute secretory otitis media. The levels of tumor necrosis factor, interleukin-6 and interleukin-10 in the ear effusion of patients with acute secretory otitis media are abnormally increased, the combined therapy of compound shuanghua tablet with western medicine can reduce the levels of tumor necrosis factor, interleukin-6 and interleukin-10, and thus improving the clinical symptoms of patients and enhancing the efficiency of treatment. In addition, in patients with acute secretory otitis media caused by swimming, attention should be paid to the cause of the disease and the protection of ear hygiene should be strengthened. The sample size in study is small. In order to better demonstrate the treatment effect of this program, more large sample studies are needed in the future.

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