Clinical observation on the therapeutic effect of desloratadine citrate disodium in the treatment of chronic urticaria and changes in IL4, IL18, IL23 and IL-33 levels before and after treatment

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Abstract: The effect of citrate to Desloratadine Citrate Disodium set in the treatment of chronic urticaria in patients with IL4, IL18, and IL23, IL33 levels was investigated. 100 cases of chronic urticaria treated in our hospital from January 2013 to January 2015 were divided into study group and control group by random number table method. Patients in the study group with chloric thunder of citric acid treatment, the control group were treated with mizolastine in the treatment, the treatment time for 2 weeks. The difference of curative effect between the two groups and the changes of IL4, IL18, IL23, IL 33 before and after treatment in two groups were compared. After two weeks of treatment, the total effective rate of the study group was 94%, while the total effective rate of the control group was only 78%, which was statistically significant ($P<0.05$). Before treatment, the two groups of patients with IL4, IL18, IL23, IL33 levels were higher, and the difference between the groups was not statistically significant ($P>0.05$), after treatment, the two groups of patients with IL4, IL18, IL23, IL33 were decreased, but the study group patients decreased significantly, the data between the two groups was statistically significant ($P<0.05$). Conclusion: Desloratadine citrate disodium treatment effect of chronic urticaria is better, and after treatment, IL4, IL18, IL23, IL33 levels decreased significantly.

Keywords: Desloratadine citrate disodium capsules, chronic urticarial, IL4, IL18.

INTRODUCTION

Chronic urticaria (CU) is a common allergic skin disease, with clinical manifestations of skin and mucosal erythema, wheals and skin itching, and even chest distress and shock for severe cases (Palmer *et al*., 2011; Li *et al*., 2014). The pathogenesis of chronic urticaria is still unclear yet, some researchers believe that, due to the body's inflammatory responses occurring in the skin, chronic urticaria is often associated with the elevated levels of inflammatory factors (Palmer *et al*., 2011; Puxeddu *et al*., 2013). Desloratadine Citrate Disodium is an antihistamine drug that has been widely used in the clinical treatment of chronic urticaria (Pushparaj *et al*., 2012; Zhang, 2013). In this study, we investigated the therapeutic effect of Desloratadine Citrate Disodium in the treatment of chronic urticaria and its effect on the levels of IL4, IL18, IL23 and IL33.

MATERIALS AND METHODS

Clinical data

One hundred patients with chronic urticaria enrolled in our hospital from January 2013 to January 2015 were selected, and these patients were divided into the study group and control group according to random number table method, 50 cases in the study group, of which, 22 female cases and 28 male cases, aged 16-60 years, mean age of (38±2) years; and 50 cases in the control group, of which, 24 female cases and 26 male cases, aged 16-60 years, mean age of (37±3) years. Detailed information was shown in table 1. The study was approved by the Medical Ethics Committee of the Guangzhou Red Cross Hospital, China. All patients provided written informed consent.

Inclusion criteria and exclusion criteria

Patients selected in this study met the following criteria: 1). explicitly diagnosed with chronic urticaria according to the diagnostic criteria for chronic urticaria in the Dermatology and Venereology (The eighth version) (Zhang, 2013) 2).Normal heart and kidney functions; 3).No allergy history of antihistamine drugs. Patients who met any one of the following items should be excluded: 1).taking immunosuppressant recently; 2).with severe heart, liver and kidney failure; 3). participating in other clinical trials; 4).pregnant and lactating women.

Method

Patients in the control group took mizolastine orally (produced by Xian Janssen Pharmaceutical Ltd., with approval number: GYZZ J20130111), one tablet each time (10 mg), once a day. In the study group, patients took Desloratadine Citrate Disodium (produced by Guangzhou Hairui Pharmaceutical Co., Ltd., Yangtze River Pharmaceutical Group, with approval number: GYZZ H20090138), one tablet each time (8.8 mg), once a day. The duration of treatment lasted 2 weeks.

Evaluation

The difference in therapeutic effect and the changes of

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IL4, IL18, IL23 and IL33 before and after treatment in the two groups were compared.

The evaluation of the therapeutic effect for chronic urticaria was as follows: The symptoms were scored according to the severity of illness condition, including main items of itching, number of wheals, size of wheals and duration of wheals, each item was scored 0~3 points, and 12 points in total, the higher the score, the more severe the clinical symptoms. The therapeutic effect was classified into four levels according to the scores of symptoms, i.e. 1). cured: the symptom score of patient decreased by γ 90% compared with that before treatment; 2). markedly effective: the symptom score of patient decreased by γ 60% and <90% compared with that before treatment; 3). effective: the symptom score of patient decreased by □20% and <60% compared with that before treatment; 4). Ineffective: the symptom score of patient decreased by <20% or even increased compared with that before treatment. The overall effective included cured, markedly effective and effective.

The detection method of serum IL4, IL18, IL23, IL23, IL33 levels was as follows: Before and after treatment, 5 ml of vein blood was drawn from the elbows of patients, after stand still for half an hour at room temperature, the blood was centrifuged at 1500r/min for 10 min, and then the upper layer of serum was fetched for testing. Testing of IL4, IL18, IL23, IL33 was performed by ELISA method. Test papers were purchased from Nanjing Jiancheng Biological Co., Ltd.

STATISTICAL ANALYSIS

Statistical analysis of all data in this study was performed by SPSS19.0 software. The measurement data were tested by t test, and count data were compared by chi-square X^2 test, a=0.05. P<0.05 was considered statistically significant.

RESULTS

Therapeutic effect in the two groups

Basic information of patients in the two groups as shown in table1, study group has 50 cases, male cases 28 and female cases 22; control group has 50 cases, male cases 26 and female cases 24, age range 20~60. In the study group, 19 cases were cured, 15 cases were markedly effective, 13 cases were effective and 3 cases were ineffective; and in the control group, 8 cases were cured, 19 cases were markedly effective, 12 cases were effective and 11 cases were ineffective.

As shown from the table 2, the therapeutic effect in the study group was significantly superior to that in the control group, showing statistical significance between groups.

The levels of IL4, IL18, IL23, IL33 before treatment in the two groups

The levels of IL4, IL18, IL23, IL33 before treatment in the two groups were shown in the table 3 below. As shown from the table 3, the levels of IL4, IL18, IL23 and IL33 in serum in the study group were not statistically different from those in the control group before treatment (P> 0.05).

The levels of IL4, IL18, IL23 and IL33 after treatment in the two groups

The levels of IL4, IL18, IL23, IL33 after treatment in the two groups were shown in the table 4. As shown from the table above, the levels of IL4, IL18, IL23, IL33 in the two groups were decreased after treatment, but those in the study group were decreased more significantly, and the results in the study group were statistically significant from those in the control group (P <0.05).

DISCUSSION

The main clinical manifestations of chronic urticaria are skin rash, wheals and skin itching. The skin rash in patients with chronic urticaria is multiple, with a long duration for several months or even several years. In addition to skin symptoms, it is accompanied by systemic symptoms and organ damage, such as fever, abdominal pain, diarrhea, etc., which seriously affected the patient's health and quality of life (Palmer *et al*., 2011). The pathogenesis of chronic urticaria is diverse, drugs, pollens, mosquito bites, food, clothing friction may induce chronic urticaria (Zhang *et al*., 2011). The pathogenesis of chronic urticaria is complex, and there is no consensus yet. In recent years, some researchers proposed that the occurrence of chronic urticaria is associated with the dysfunction of T helper cell subsets (Th1 and Th2), related with the abnormal expressions of IL-1 cluster of cytokines (Puxeddu, 2013). There are a number of IL-1 cluster of cytokines, of which, the cytokines with abnormal expressions in patients with chronic urticaria are mainly IL-4, IL-18, IL-23 and IL-33(Pushparaj *et al*., 2012). Meng Zudong *et al* believed that IgE was in an over-expression state in patients with chronic urticaria, and IL-4 could promote B cells to secrete IgE, therefore, the serum IL-4 in patients with chronic urticaria should be in a high-expression state. IL-18 and IL23 mainly induce Th1 and natural killer cells (NK cells) to secrete INF-γ, which activates Th1, synergizes Th2 and activates cytokines in Th2-type reactions to regulate Th1 and Th2 immune responses. IL-18 can not only promote the differentiation of Th1 type, Th2 type cytokines, but also produce IgG, IgE antibodies, leading to occurrence of allergic reactions. IL-33 is a ligand for IL-1 cluster of ST2, which is activated by binding to ST2 to enhance the Th2 type immune response.

Desloratadine Citrate Disodium is an antihistamine drug, which is featured by difficulty to pass through the blood-

Table 1: Basic information of patients in the two groups

Group	Number of cases (n)	Sex (n)		Age (year)	
		Male cases	Female cases	Range	Mean age
Study group	50	28	22	20~60	38±2
Control group	50	26	24	21~60	37±3
t value		1.305		0.953	
P value		0.072		0.085	

Table 2: Therapeutic effect in the two groups

Group	Number of cases (n)	Cured [n(%)]	Markedly effective [n(%)]	Effective [n(%)]	Ineffective [n(%)]	Overall effective rate (%)
Study group	50	19(38.0)	15(30.0)	13(26.0)	3(6.0)	94.0
Control group	50	8(16.0)	19(38.0)	12(24.0)	11(22.0)	78.0
X^2 value						5.861
P value						0.017

Table 3: The levels of IL4, IL18, IL23, IL33 before treatment in the two groups

Group	IL4(ng/L)	IL18(ng/L)	IL23(ng/L)	IL33(ng/L)
Study group	167.42±19.2	135.19±32.75	147.33±26.48	119.06±47.76
Control group	171.29±22.4	134.95±29.08	145.71±25.15	121.11±43.53
X^2	0.974	3.743	3.981	1.428
P value	0.112	0.037	0.029	0.072

Table 4: The levels of IL4, IL18, IL23, IL33 after treatment in the two groups

Group	IL4(ng/L)	IL18(ng/L)	IL23(ng/L)	IL33(ng/L)
Study group	117.28±21.03*	88.47±27.39*	91.97±23.41*	74.51±32.95*
Control group	148.62±19.70#	102.61±25.81#	105.28±24.27#	92.96±29.47#
X^2	3.963	4.624	5.021	4.932
P value	0.042	0.035	0.029	0.033

(Note: * indicated that the levels of IL4, IL18, IL23, IL33 and IL33 were decreased after treatment in the study group, and P<0.05; # indicated that the levels of IL4, IL18, IL23, IL33 were decreased after treatment in the control group, and P<0.05).

brain barrier and with potent anti-inflammatory effects, etc.. Its main mechanism is to play a role by antagonism of peripheral H1 receptor. Some researchers believed that, Desloratadine Citrate Disodium could not only antagonize the H1 receptor, but also inhibit the release of immune mediators, inhibit the expression of adhesion molecules, and stabilize the mast cells, thereby playing an anti-inflammatory effect (Caproni *et al*., 2014).

In this study, 100 patients with chronic urticaria with no statistical difference in clinical data were chosen, and they were divided into the study group and control group. Patients in the study control received Desloratadine Citrate Disodium treatment, and those in the control group received the treatment of traditional drug-mizolastine. After a complete course of treatment (14 days), the overall effective rate was 94.0% in the study group, and 78.0% in the control group; the therapeutic effect of mizolastine was similar to that reported in other studies (Tang, 2013), and there was no significant difference in the therapeutic effect between the two groups (P <0.05). For the levels of IL-4, IL-18, IL-23 and IL-33, there was no significant difference between the two groups before treatment (P>0.05), after treatment, although the levels of IL-4, IL-18, IL-23 and IL-33 in the control group were decreased, the decrease in the study group was more significant, basically returning to the normal levels, basically consistent with the clinical manifestations of patients. Therefore, the IL-1 cluster of cytokines such as IL-4, IL-18, IL-23, IL-33 basically matched the clinical symptoms of chronic urticaria, suggesting that, it is worthy of further study on the IL-1 cluster of cytokines to achieve diagnosis when some cases with suspected chronic urticaria are difficult to diagnose.

CONCLUSION

In summary, Desloratadine Citrate Disodium is effective for the treatment of chronic urticaria, and the levels of IL-4, IL-18, IL-23, IL-33 are decreased significantly after treatment.

REFERENCES

Caproni M, Volpi W and Glomi B (2014). Chronic idiopathic and chronic autoimmune urticaria: Clinical and immunopathological features of 68 subject. *Acta. Derm. Venereol.,* **84**(4) :288-290.

Jxie X, LI X, Tian J (2013). The Influences of mizolastine on the levels of IFN-γ and IL-4 in peripheral blood of patients with chronic urticaria. *Clin. Dermatol.*, **42**(7): 402-404.

Li L, Zhang Y and Yin L (2014). Expressions of interleukin-25 and interleukin-33 in peripheral blood of patients with chronic urticaria and their significance. *Chin. J. Derm.*, **27**(4): 284-286.

Meng Z, Sheng W and Wang H (2015). Effects of desloratadine citrate disodlum on the level of IL-18 and IL-33 in the patients with chronic urticaria. *Chin J. Lepr. Skin PIS.,* **31**(3): 169-171.

Palmer G and Gabay C (2011). Interleukin-33 biology with potential insights into human diseases. *Nat Rev Rheumatol,* **7**(6): 321-329.

Puxeddu I, Italiani P and Giungato P (2013). Free IL-18 and IL-33 cytokines in chronic spontaneous urtocatoa. *Cytokine*, **61**(3): 741-743.

Pushparaj P, Tay H and H'ng S (2012).The cytokine interleukin-33 mediates anaphylactic shock. *Proc. Natl. Acad. Sci. USA.*, **106**(24): 9773-9778.

Tang Q, Mo H (2013). The effect of desloratadine in chronic urticaria and related factors of serum. *J. Ning. Medi. Univ.*, **35**(8): 911-913.

WEI Y, Zhang J and AN R (2010). Combination effect of tripterygium wilfordii with desloratadine on the treatment of chronic idiopathic urticaria. *Chin. J. Derm. Venereo.,* **24**(12): 1170-1172.

Zhang X (2013). Dermatology. Eighth ed. Beijing: People's Medical Publishing House, **2**: 115-118.

Zhang Y and Xiang Y (2011). Detection of serum specific IgE and total IgE in patients with chronic urticaria, *Chin. J. Dermato. Venerol. Integ. Trad.,* **10**(2): 113-114.