

Dietary Intervention Indirectly Treats Chronic Urticaria Caused by Food

Yixian Zhang *

Hebei High School affiliated to Tianjin Academy of Educational Sciences, China

* Corresponding Author Email: wangnx@bjut.edu.cn

Abstract. With the development of medicine and society, more and more people have been diagnosed with chronic urticaria, which has gradually attracted people's attention, and dietary intervention has become a method for many people to treat chronic urticaria. The current research has achieved remarkable results in the treatment of hives with specific dietary methods, but it does not provide a specific direction for the remedy of nettle-rash in terms of diet. This article summarizes the data from various aspects, analyzes the research on the remedy of chronic urticaria in diet, and exist the relationship between diet intervention and chronic urticaria, and have a positive influence on the remission and cure of hives. This article provides a self-treatment method for patients with nettle-rash to delay and inhibit the disease, and this article can provide a general direction for future research on indirect treatment of hives through diet. However, the specific pathogenesis of chronic urticaria and the specific relationship between diet and the disease have not been found. Future research can focus on the specific pathogenesis of nettle-rash and the specific relationship between diet and the disease.

Keywords: Chronic urticaria, dietary intervention, food intolerance, mediterranean diet, no histamine diet.

1. Introduction

According to traditional Chinese medicine, chronic urticaria (CU) is classified as an "addictive rash." This skin condition causes red or pale wind masses on the skin and is itchy and allergic. The primary clinical signs include the wind mass being periodically obscured, lacking a specific location, and leaving no trace once it has subsided. The illness lasts longer than six weeks. Patients experience severe physical and mental suffering as a result of its frequent occurrences and excruciating itching, which also causes significant problems with every single day life and work [1]. In numerous countries, the lifetime prevalence of CU is 1.8%, while the annual prevalence can vary between 0.5% to 2.3%. Patients' quality of life is impacted adversely by CU and further harm is frequently caused when vascular edema is occurring [2].

CU has received growing interest as society and medicine have advanced, although the pathophysiology of CU continues to remain uncertain. At present, the main saying is that allergens stimulate the human corporeity to emerge distinctive antibody IgE (immunoglobulin E). The mast cells and granulocyte well stick to the IgE antibody. When eating this food again, IgE antibody unites with allergens, so that mast cells and basophilic leukocytes transport beta-imidazolethylamine. Meanwhile, histamine leads blood vessels to enlarge and become more permeable, which allows a lot of fluids and calcium to seep into the tissues of the skin and promote urticaria.

Based on the current situation that the disease is difficult to cure in Western medicine, the treatment cycle is long and the curative effect is not obvious, the idea of controlling food intake in nutrition can be used to carry out diet intervention for patients with CU, such as Mediterranean diet (MD), histamine-free diet and other methods, so as to strengthen their own immunity, thereby delaying the onset cycle of CU and inhibiting the incidence of the disease. At present, it is an indirect treatment that can be implemented and has a significant effect to achieve the purpose of treatment.

This article will introduce dietary interventions for indirect treatment of CU that are currently being used or under study. So as to provide a convenient and effective self-treatment method in life for patients with CU to delay and inhibit the disease.

2. CU caused by dietary allergens

Allergens in foods mainly include seafood, beef and mutton, eggs, milk, vegetables, fruits, nuts, grains, etc. In daily life, the patient's allergic source can be understood by the method of allergic source detection. In vitro, detection methods of allergens mainly include specific IgE detection and IgG4 detection. In vitro detection method of allergens mainly have measurement of IgE, IgG4 and so on. The determination of linear epitope or conformational epitope binding may be more powerful than the traditional way to judge whether the patient has food allergies. IgE receptor (FcεRI) also can be a biomarker of the disease of IgE mediate. What's more, allergen-specific Th2A cells and memory B cells as the new biomarkers of the cell have been found. Functional assays in vitro or in vitro mimicking allergen exposure, such as the basophil activation test (BAT) and mast cell activation test (MAT), provide the possibility to evaluate allergen-induced IgE crosslinking (Table 1) [3].

Table 1. Classification of major allergens and their sources [3].

Allergen source	2S albumin	Cupin *vicilin type **legumin type	Ovomucoid	Tropomyosin	Caseins
Peanut	Ara h 2 Ara h 6	Ara h 1*			
Egg			Gal d 1		
Shrimp				Lit v 4	
Cow's milk					Bos d 8

3. No Food Allergy Source

3.1. No Allergic Source but Lead to Allergies

In another case, the patient cannot detect the source of allergy, but always eat a kind of food, the occurrence of allergies, and both food intolerance. In CU, food intolerance is more common than food allergy, but it is different from allergy. These are defined as food-related symptoms, which are objectively repeatable, but do not involve immunological mechanisms [4]. For example, alcohol, food additives, seafood, certain vegetables and fruits, fermented foods and other dietary factors can produce food intolerance.

3.2. Food Intolerance

In contrary to IgE-mediated immediate food allergy, IgG-mediated food intolerance is a delayed reaction that is often triggered by a variety of foods. Specific IgG antibodies and food particles form an immune complex that can cause intestinal and systemic multi-tissue inflammatory reactions. Food intolerance is a repetitive IgG-mediated immune response to inimitable foods or food components. It can occur at any age and is distinguished by delay (hours to days), quantity dependence, and accumulation. It is strongly associated with a number of chronic diseases that damage the digestive, biological, cardiovascular, and other systemic systems in addition to skin.

4. Diet Intervention

4.1. Background

Dietary intervention is a way to improve the condition of disease and promote health by adjusting dietary composition, intake or eating frequency. Common dietary intervention methods include MD, no histamine diet, low-fat diet, high-protein diet, low-carbohydrate diet, vegetarian diet and so on.3.2 Study on the effect of dietary intervention on CU patients.

4.2. Study on the Effect of Dietary Intervention on CU Patients

4.2.1. Experiment selection, method

From July 2009 to May 2010, a total of 94 patients with CU caused by 14 food allergen-specific (IgG) were diagnosed in the Provincial Hospital Affiliated to Shandong University.

Among 94 cases, 50 cases were divided into intervention group and 46 cases were divided into control group. The two groups were treated with drugs at the same time, and the intervention group was given dietary guidance. Face-to-face consultation was performed at the same time interval to evaluate the skin lesion area, seizure frequency, number of wheals, itching degree and other indicators of the two groups of patients. The scores were recorded according to the 0-3 four-level scoring method for data analysis.

4.2.2. Experimental results

Table2. Comparison of treatment between the two groups on the 28 th day and the 35 th day [5].

Time	Peer Group	n	Recovery	Effectual	Effective	Invalid
Day 28	Intervention group	50	34	8	5	3
	Control group	46	18	8	10	10
Day 35	Intervention group	50	35	8	4	3
	Control group	46	15	6	13	12

Table 3. Comparison of specific IgG test results before and after dietary intervention in patients [5].

Item	n	Positive rate (%)
Before dietary intervention	168	41.7
Intervention for 3 months	168	17.3

The intervention group's rehabilitation was noticeably superior to the control groups, it can be established (Table 2). This shows that fasting and restricted food intolerance can effectively control the symptoms of CU. After three months of dietary intervention, the positive rate of IgG antibody in the intervention group was significantly lower than that before intervention (Table 3), which indicated that dietary intervention had a significant effect on the treatment of CU.

5. Specific Dietary Intervention Methods to Treat CU

5.1. Effect of MD on CU Patients

5.1.1. Experiment selection, method

Age- and gender-matched healthy controls between the ages of 18 and 65 were chosen, as were patients with chronic spontaneous urticaria. Participants were excluded if they had a history of cardiovascular and cerebrovascular events, a current infection, any uncontrolled skin or systemic disorders other than CSU (for the patient group), or a history of regular medication use for any cause. Furthermore, CSU patients were not permitted to receive immunosuppressive medications like cyclosporine or systemic steroid regimens like omalizumab.

Table 4. Descriptive characteristics of patients [6].

	Group of sufferers (n=100)	Group within control (n=100)
Age, years	38.6±13.0	38.7±13.8
Male,n(%)	30(30)	41(41)
BMI, kg/m ²	24.8±3.82	24.2±4.0
Smoking,n(%)	34(34)	43(43)
Alcohol user,n(%)	12(12)	12(12)
MD score	5.40±1.88	6.30±1.39

The urticaria activity score (UAS7) for more than 7 days included two symptoms: The frequency of wheals and the duration of itching, and each day's score varied between 0 to 3 The UAS7 gauges the seriousness of CSU symptoms throughout the week preceding it by adding up two scores each day for seven days in a row, for a combined score of 0-42 points.

A relatively straightforward four-item assessment instrument used to evaluate CSU patients' illness control is the Urticaria Control Test (UCT). It primarily consists of two sections to evaluate the occurrence of symptoms as well as the degree to which pharmaceuticals inhibit them. A low score denotes poor disease control and excessive disease activity. UCT scores ranged from 0 to 16, with 0 being the minimum and 16 the maximum. Poor disease control is indicated by less than 12 points, whilst good disease control has been demonstrated by more than 12 points (Table 4) [6].

5.1.2. Experimental Result

Table 5. Multivariate logistic regression analysis to predict chronic spontaneous urticarial [6].

	Univariable the percentage chance ratio (95% confidence interval)	Multivariable the percentage chance ratio (95% confidence interval)
Depression	0.298 (0.104–0.855)	0.320 (0.280–0.361)
Fibromyalgia	0.323 (0.112–0.935)	0.341 (0.140–0.563)
Low-Density Lipoprotein Cholesterol	0.985 (0.975–0.995)	0.997 (0.984–1.009)
High-Density Lipoprotein Cholesterol(HDL)	1.070 (1.034–1.107)	1.049 (1.002–1.098)

Univariate and multivariate logistic regression analysis (Table 5) was performed on these 100 patients to determine the variables that predicted chronic spontaneous urticarial (Table 5). The variables include LDL and HDL cholesterol concentrations, as well as the occurrence of depression and fibromyalgia syndrome. HDL levels and depression were dramatically correlated with CSU in multivariate analysis [7].

The urticaria activity score of patients over 7 days was negatively correlated with the MD score, and the urticaria control test score was positively correlated. It can be concluded that the Mediterranean diet has a positive effect on the treatment of CU and can control the condition of CU.

5.2. Effect of Histamine-free Diet on CU Patients

5.2.1. Experiment selection and methods

Altogether 22 adult patients with CU were enrolled, including 11 men and 11 women. The average age was 41.2 ± 16.1 years. The average treatment time before enrollment was 22 ± 25.2 (range 0-73) months. Patients with any skin disease or systemic disease that can cause itching, uncontrolled chronic diseases and chemicals (tagamet, cefuroxime, isonicotinyl hydrazide, aminoguanidine, aralen, nepresol, heparin, etc.), likewise pregnant individuals, individuals with any physical examination abnormalities, patients with food preferences, and patients who could contribute to the expression of histamine and DAO activity were all wiped out. Before the study launched, all patients were on an untainted, free diet.

All patients forbidden from high histamine eating for 4 weeks. Assess the severity of urticaria via urticaria severity score (USS) and urticaria activity score (UAS). All patients need to take notes of their daily UAS and count the total scores of the week (UAS7). Finally, dermatologist need to check for changes of the total scores every week. In that this method must ask the scores of the week, it was hard to gain the UAS and analysing the date. The UAS7 ranges from 0 to 42. The components of USS are some problems such as the degree of itching, days or average hours of CU, average take the Antiamine tablets every day, sleep quality, and so on. The USS ranges from 0 to 92. The diamineoxidase (DAO) campaign and the Adtevak beta-imidazolylethylamine standard were measured and compared before (baseline) and after a histamine-free diet. Topical steroids and oral antihistamines have been authorized for the purification of CU during the observational period.

However, the amount and types of prescription drugs CU treated can be diminished from the initial state, but not increased, in order to figure out the effect of a histamine-free diet [8].

5.2.2. Experimental results

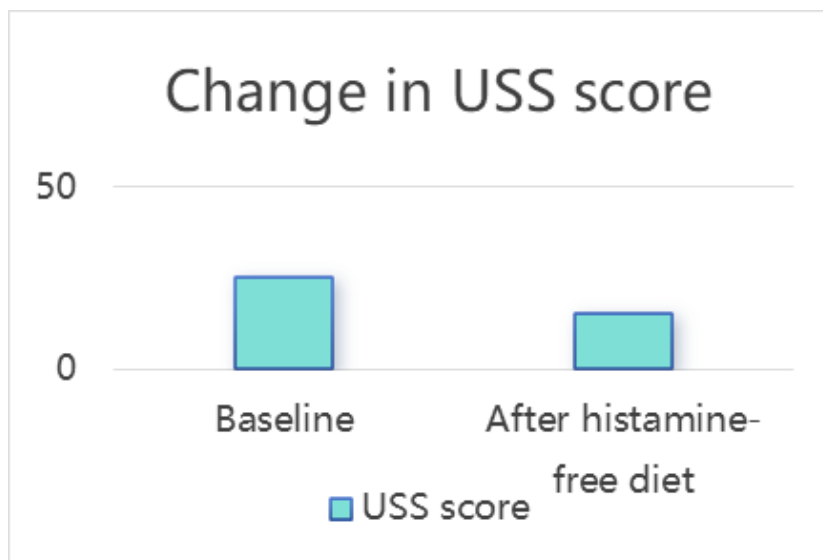


Figure 1. Change in the USS [7].

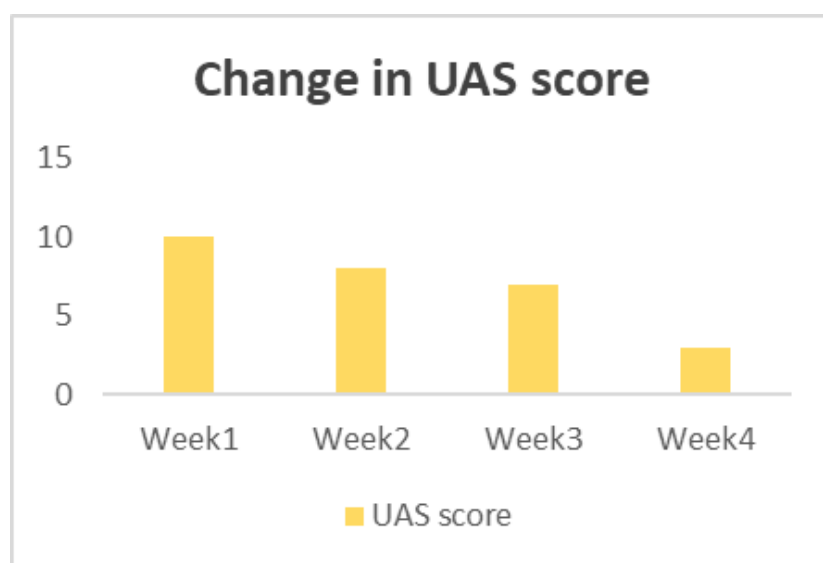


Figure 2. Change in the UAS [7].

Scores on the USS and UAS before and after the histamine-free diet were substantially distinct. During a histamine-free diet, plasma histamine levels were considerably lower than baseline. Nevertheless, following the histamine-free diet, DAO activity remained intact. A histamine-free diet is helpful for addressing adult CU sufferers, and research has indicated that histamine intake may be interconnected with the severity of CU (Figure1 and Figure 2).

6. Conclusion

Diet interventions such as the MD and the histamine-free diet have a significant indirect therapeutic effect on the treatment of CU. Although it is impossible to determine the direct effect of diet on CU due to the complexity of CU pathology, it can be determined from this study that there is a relationship between diet intervention and CU, and it has a positive effect on the remission and cure of CU.

The results of this study can provide a convenient and effective self-treatment method in life for CU patients to delay and inhibit the disease. In daily life, CU patients should eat less oil and less salt, reduce the intake of irritating food, drink more water, and eat more fruits and vegetables. And this article can provide a general direction for future research on indirect treatment of CU through diet.

This study only provides indirect dietary treatment for CU patients, and does not study the specific pathogenesis of CU. Through the data, it is known that there is an inevitable relationship between diet and CU, but the specific relationship between the two has not been studied.

With the rapid development of science and technology, it is hoped that the specific pathogenesis of CU can be discovered as soon as possible, the specific relationship between diet and CU can be found, and effective treatment methods for CU can be found from other aspects, so that CU patients can be cured and no longer suffer from repeated CU.

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