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CHRONIC URTICARIA AND THE ROLE OF DIET : A SYSTEMATIC REVIEW

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ABSTRACT

Background: Patients with chronic urticaria (CU) frequently inquire about dietary modifications. According to research, certain dietary adjustments may be beneficial to a subset of patients. Immunological food reactions are uncommon, but probable triggers of CU include those encountered in specific situations, such as people with a history of tick bites, raw or marinated fish intake, or celiac disease. **Methods:** By comparing itself to the standards set by the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020, this study was able to show that it met all of the requirements. So, the experts were able to make sure that the study was as up-to-date as it was possible to be. For this search approach, publications that came out between 2014 and 2024 were taken into account. Several different online reference sources, like Pubmed and SCIENCE DIRECT, were used to do this. It was decided not to take into account review pieces, works that had already been published, or works that were only half done. **Result:** In the PubMed database, the results of our search brought up 34 articles, whereas the results of our search on SCIENCE DIRECT brought up 16 articles. The results of the search conducted for the last year of 2014 yielded a total 12 articles for PubMed and 4 articles for SCIENCE DIRECT. In the end, we compiled a total of 5 papers, 4 of which came from PubMed and 1 of which came from SCIENCE DIRECT. We included five research that met the criteria. **Conclusion:** In summary, there is evidence for the efficacy of diets in chronic urticaria (CU) in individual individuals with clinical symptoms, but there is little evidence for the usefulness of systematic diets in CU due to a lack of systematic double-blind controlled trials. In our daily practice, we advocate asking patients whether they can identify any specific food allergies in their diet. If this is the case, we recommend following a tailored diet that excludes these identified food allergies. If not, we don't advocate any diets.

Keyword: Chronic urticaria, Diet, Effect

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INTRODUCTION

Patients with chronic urticaria (CU) frequently inquire about dietary modifications. According to research, certain dietary adjustments may be beneficial to a subset of patients. Immunological food reactions are uncommon, but probable triggers of CU include those encountered in specific situations, such as people with a history of tick bites, raw or marinated fish intake, or celiac disease. Nonimmunological dietary intolerances may also have a role, albeit the mechanism is not well understood. Trials of pseudoallergen-free and low-histamine diets resulted in partial remission in a subset of patients, while oral provocation testing confirmed that some patients' symptoms worsened after consuming food additives, tomatoes, herbs, seafood, alcohol, and other foods.[1]

There is also a higher prevalence of vitamin D insufficiency in CU patients compared to healthy controls. While prescription antihistamines remain the primary treatment in CU, a small number of patients may be educated on potential dietary variables. Further testing is indicated for those who are at risk or have symptoms that suggest celiac disease, vitamin D deficiency, delayed reactions to mammalian meat, or exposure to raw fish. While some individuals may receive dietary modification education, this strategy may benefit just a fraction of people, and no test exists to identify these patients.[1]

Patients with chronic urticaria (CU) often consider diet modification and discuss potential trigger foods. In this review, we evaluate the evidence behind potential dietary triggers for CU including immunological triggers (eg, galactose-α-1,3-galactose [α-gal] in meat and *Anisakis simplex* in uncooked fish) and nonimmunological triggers. Nonimmunological triggers include compounds in tomatoes, food additives, herbs, wine, and other foods, as well as histamine in foods. The evidence and potential mechanisms behind these trigger foods is presented. Finally, we explore the increased prevalence of vitamin D deficiency in CU.[2]

Urticaria is a relapsing-remitting illness that significantly impairs quality of life (QOL). Clinically, 50% of patients show with solely cutaneous wheals, 10% with angioedema, and 40% with both. Individual lesions typically last ≤24 hours. According to current recommendations, urticaria is classified as acute or chronic depending on its duration of less than or greater than 6 weeks. CU is further characterized as spontaneous (no specific triggering stimulus involved) or inducible. The lifetime prevalence in the general population is estimated to be 9%, with a severe impact on patients' quality of life. CU is very difficult for patients since it is typically treatment-resistant, long-term, and idiopathic.

Chronic urticaria can occur at any age, accounting for 20% of all skin illnesses in the United States in 2019. The majority of cases (80-90%) are idiopathic chronic urticaria. Between 2010 and 2014, the prevalence of chronic urticaria was 2256.5 per 100,000 people, and it rose year after year.[3]

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This review focuses on dietary adjustments for CU, specifically chronic spontaneous urticaria. This systematic review was conducted to recognize and understand the clinical features of urticaria and the role of diet modification in chronic urticaria to minimise the side effect of long-term therapy.

METHODS

Protocol

By following the rules provided by Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020, the author of this study made certain that it was up to par with the requirements. This is done to ensure that the conclusions drawn from the inquiry are accurate.

Criteria for Eligibility

For the purpose of this literature review, we review published literature contains the effect of diet in chronic urticaria patients. This is done to provide an explanation and improve the handling of treatment at the patient. As the main purpose of this paper, to show the relevance of the difficulties that have been identified as a whole.

In order for researchers to take part in the study, it was necessary for them to fulfil the following requirements: 1) The paper needs to be written in English. In order for the manuscript to be considered for publication, it needs to meet both of these requirements. 2) The studied papers include several that were published after 2013, but before the time period that this systematic review deems to be relevant. Examples of studies that are not permitted include editorials, submissions that do not have a DOI, review articles that have already been published, and entries that are essentially identical to journal papers that have already been published.

Search Strategy

We used "chronic urticaria" and "diet" as keywords.The search for studies to be included in the systematic review was carried out using the PubMed and SCIENCE DIRECT databases by inputting the words: *(("chronic urticaria"[MeSH Terms] OR ("chronic"[All Fields] AND "urticaria"[All Fields]) OR "chronic urticaria"[All Fields]) AND ("chronic"[All Fields] OR "chronical"[All Fields] OR "chronically"[All Fields] OR "chronicities"[All Fields] OR "chronicity"[All Fields] OR "chronicization"[All Fields] OR "chronics"[All Fields]) AND ("urticaria"[MeSH Terms] OR "urticaria"[All Fields] OR "urticarias"[All Fields]) AND ("diet"[MeSH Terms] OR "diet"[All Fields])) AND ((clinicaltrial[Filter]) AND (2014:2024[pdat]))* used in searching the literature.

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Data retrieval

After reading the abstract and the title of each study, the writers performed an examination to determine whether or not the study satisfied the inclusion criteria. The writers then decided which previous research they wanted to utilise as sources for their article and selected those studies. After looking at a number of different research, which all seemed to point to the same trend, this conclusion was drawn. All submissions need to be written in English and can't have been seen anywhere else.

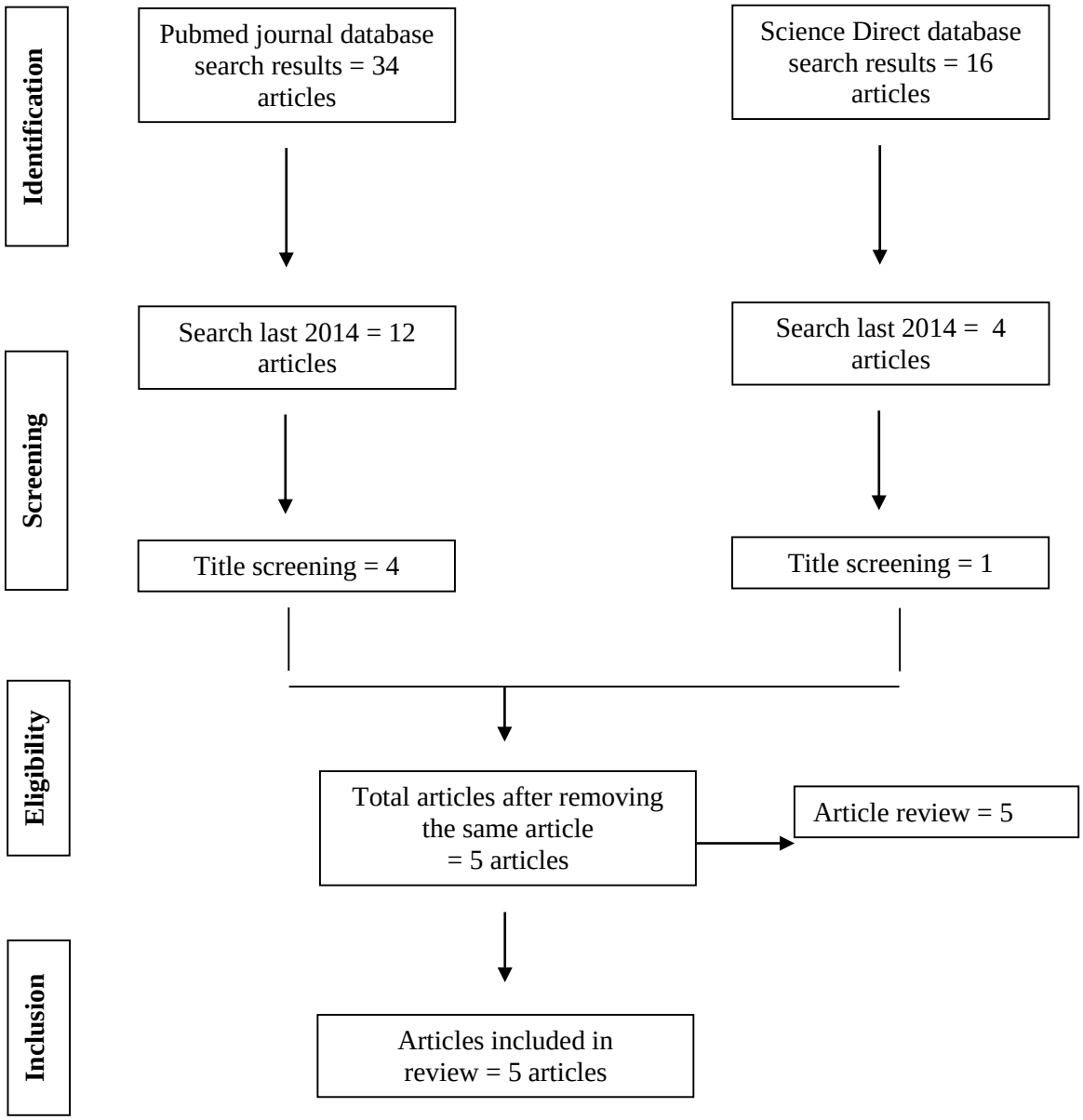

Figure 1. Article search flowchart

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Only those papers that were able to satisfy all of the inclusion criteria were taken into consideration for the systematic review. This reduces the number of results to only those that are pertinent to the search. We do not take into consideration the conclusions of any study that does not satisfy our requirements. After this, the findings of the research will be analysed in great detail. The following pieces of information were uncovered as a result of the inquiry that was carried out for the purpose of this study: names, authors, publication dates, location, study activities, and parameters.

Quality Assessment and Data Synthesis

Each author did their own study on the research that was included in the publication's title and abstract before making a decision about which publications to explore further. The next step will be to evaluate all of the articles that are suitable for inclusion in the review because they match the criteria set forth for that purpose in the review. After that, we'll determine which articles to include in the review depending on the findings that we've uncovered. This criteria is utilised in the process of selecting papers for further assessment. in order to simplify the process as much as feasible when selecting papers to evaluate. Which earlier investigations were carried out, and what elements of those studies made it appropriate to include them in the review, are being discussed here.

RESULT

In the PubMed database, the results of our search brought up 34 articles, whereas the results of our search on SCIENCE DIRECT brought up 16 articles. The results of the search conducted for the last year of 2014 yielded a total 12 articles for PubMed and 4 articles for SCIENCE DIRECT. In the end, we compiled a total of 5 papers, 4 of which came from PubMed and 1 of which came from SCIENCE DIRECT. We included five research that met the criteria.

Wagner, et al[4] (2017) showed that low-histamine diet is a therapeutically useful, simple and cost-free tool to decrease symptoms and increase quality of life in chronic urticaria patients with gastrointestinal involvement. Further research is needed to understand the role of diamine oxidase.

Siebenhaar, et al[5] (2016) showed that low-histamine diet is a therapeutically useful, simple and cost-free tool to decrease symptoms and increase quality of life in chronic urticaria patients with gastrointestinal involvement. Further research is needed to understand the role of diamine oxidase.

Son, et al[6] (2018) showed that the histamine-free diet resulted in significant clinical improvements in urticaria severity and a considerable reduction in plasma histamine levels. Even if the quantity of medicines needed was not lowered and plasma diamine oxidase activity was not altered, a histamine-free diet cannot be

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considered useless because it caused a urticaria severity score (USS) or urticaria activity score (UAS) shift that can be linked to the patient's quality of life. The significance of this study is that it gives real proof of the efficacy of safe adjuvant medication with minimal adverse effects. As a result, a histamine-free diet can be considered an effective supplementary therapy for chronic urtucaria (UC).

Table 1. The litelature include in this study

Author	Origin	Method	Sample	Result
Wagner et al, 2017[4]	Germany	Cohort study	56 patients	Patients suffering from CsU accompanied by gastrointestinal symptoms were included in the study. They underwent low-histamine diet for at least 3 weeks. During the whole study, urticaria activity score (UAS) was recorded daily in a patient's diary. Quality of life was assessed during screening, baseline and post diet visits by completing questionnaires (DLQI and Cu-Q(2)oL). DAO activity was measured before and after elimination diet. A total of 75% of the patients had a benefit from the low-histamine diet. Thirty-four of 56 patients (61%) reached the primary endpoint of the study, an improvement of UAS 4 of ≥3. Overall, a significant reduction

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				from 9.05 to 4.23 points (P = 0.004) was achieved; the average reduction in a strongly affected subgroup was 8.59 points (P < 0.001). DAO activity remained stable.
Siebenhaar et al, 2016[5]	Germany	Cohort study	157 patients	One third of patients (34%) had a positive history of histamine intolerance. There was no statistical difference between the mean UAS7 scores of patients with positive and negative histories (22.4 ± 1.0 vs. 22.7 ± 0.8). When kept on diet, 46% of patients responded with reduced CSU activity (UAS7 reduction of ≥7). Following double-blind, placebo-controlled oral histamine provocation, 17% of patients gave a positive weal response. There appeared to be little relationship between patient history, response to diet and the weal response to oral histamine provocation. First, the history-positive and -negative groups contained similar proportions of

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				diet and histamine provocation weal-positive patients. Second, the diet-positive and -negative groups contained similar proportions of history-positive and histamine provocation weal-positive patients. Third, the histamine provocation weal-positive and -negative groups had similar rates of history- and diet-positive patients. Finally, only 2 of the 157 patients were positive in all three domains.
Son et al, 2018[6]	South Korea	Cohort study	22 patients	Twenty-two adult patients with CU were enrolled. Foods with high amounts of histamine were prohibited to all patients for four weeks. The degree of severity of the urticaria was evaluated using the urticaria severity score (USS) and urticaria activity score (UAS). Plasma histamine levels and diamine oxidase (DAO) activity were determined and compared before (baseline) and after the histamine-free diet.

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				Twenty-two adult patients were recruited and completed four weeks of histamine-free diet. The USS and UAS scores each showed significant differences before and after the histamine-free diet (p=0.010, p=0.006). There was a significant reduction in plasma histamine level after the histamine free-diet, compared with baseline (p=0.010). However, DAO activity did not change after the histamine-free diet (p=0.165).
Sanchez et al, 2018[7]	Colombia	Cohort study	245 patients	Patients with CSU (n 245) and healthy (n 127) subjects were included. 164 (66%) subjects from CSU group and 31 (24%) from the control group reported at least one adverse reaction with foods. Food IgE sensitization was similar in both groups (17.5% versus 16.5%, respectively). 410 food challenge tests in 164 CSU patients and 38 in 38 control subjects were performed. 1.2% in CSU group and 0.7% in control group had a

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				positive oral challenge test.
Rezazadeh et al, 2018[8]	Iran	Cohort study	20 patients	20 patients with chronic urticaria and 20 age and sex matched healthy individuals were included in the present study. Stool samples were analyzed for determining the frequency and bacterial load of Lactobacillus, Bifidobacterium, and Bacteroides genera. There were no significant differences among the frequencies of detectable Lactobacillus, Bifidobacterium, or Bacteroides in stool samples of patients with chronic urticaria and healthy controls. The relative amounts of Lactobacillus and Bifidobacterium were significantly higher in fecal samples from controls compared to patients with chronic urticaria (P = 0.038 and 0.039, respectively).

Sanchez, et al[7] (2018) showed that food challenge tests have to be offered early during the medical evaluation to avoid unnecessary avoidance of foods, as they are uncommon triggers of chronic urticaria. Despite the significant frequency with which patients self-report CSU, foods are unusual triggers. Nonetheless, food challenge tests must be offered early in the medical review process to minimize unwarranted limits.

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Rezazadeh, et al[8] (2018) showed that there were no significant differences among the frequencies of detectable Lactobacillus, Bifidobacterium, or Bacteroides in stool samples of patients with chronic urticaria and healthy controls.

DISCUSSION

This systematic review involved a total of 500 data of the role of diet in urticaria chronic patients. Chronic urticaria symptoms are harmless and self-limiting. Chronic urticaria with systemic symptoms, on the other hand, can be life-threatening and could indicate anaphylactic shock.

Urticaria is a relapsing-remitting illness that significantly impairs quality of life (QOL). Clinically, 50% of patients show with solely cutaneous wheals, 10% with angioedema, and 40% with both. Individual lesions typically last ≤24 hours. According to current recommendations, urticaria is classified as acute or chronic depending on its duration of less than or greater than 6 weeks. CU is further characterized as spontaneous (no specific triggering stimulus involved) or inducible. The lifetime prevalence in the general population is estimated to be 9%, with a severe impact on patients' quality of life. CU is very difficult for patients since it is typically treatment-resistant, long-term, and idiopathic.[2,9]

Research has shown that food allergies are exceedingly uncommon causes of CU. Food allergies such as α-gal (meat) and A simplex (fish nematode) can cause symptoms of CU. Gluten consumption may cause immunological responses in celiac disease patients. Food intolerances are more commonly reported in CU than food allergies, and they are separate from allergies. These are food-related symptoms that can be objectively reproduced but do not entail an immune response. A number of foods have been reported to aggravate CU symptoms. These "trigger" foods include alcohol, food additives, seafood, some vegetables and fruits, fermented meals, and others. Food diaries, OPT, and elimination diets are all examples of diagnostic and treatment techniques. Given the safety and inexpensive cost of these short-term dietary changes, partial remission rates in more than one-third of individuals warrant additional investigation. However, any CU study must take into account the high proportion of spontaneous remissions.[10]

Urticaria clinical symptoms on the skin surface can range from pale to reddish (erythema), circular, polymorphic, or serpiginous, and can spread fast to adjacent skin surfaces. Urticaria symptoms typically appear within minutes. Chronic urticaria causes urticarial lesions that last more than six weeks. Chronic urticaria is associated with a variety of clinical manifestations, including fast onset of oedema (wheal) and angioedema. Wheal has three characteristics: central swelling of varied size, itching or burning, and a short duration, typically 1-24 hours. In 40-50% of cases, urticaria is accompanied with angioedema. A complete blood count, erythrocyte sedimentation rate, and C-reactive protein can be used to determine the cause of urticaria.[3]

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Patients with persistent urticaria should undertake dietary changes to avoid long-term pharmaceutical medication. Several studies have found that certain dietary adjustments can improve the prognosis of patients with chronic urticaria. Chronic urticaria can be caused by certain foods, including αgal in beef, Anisakis simplex in raw fish, chemicals in tomatoes, food additives, cooking spices (herbs), wine, and meals with high histamine content. Patients with vitamin D deficiency are more likely to develop chronic urticaria. It is vital to collect a patient's dietary history in order to identify specific allergens or foods that have been consumed, and patients must avoid these allergens.[3]

Urticaria is a lesion that emerges fast as an erythematous swelling on the skin's surface of the epidermis, varying in size and shape, itchy, and burning. Urticaria lesions are short-lived due to inflammatory reactions and usually resolve within 24 hours. Chemokines are the primary mediators that cause urticaria. Urticaria affects people of all ages, races, genders, jobs, geographical regions, and climates. Urticaria episodes lasting more than 6 weeks are typically chronic and are split into two primary groups: autoimmune chronic urticaria (45%) and chronic idiopathic urticaria.[3]

Dietary role dietary patterns have a significant impact on overall health. Patients urgently require dietary guidance, particularly for chronic skin disorders and long-term treatment, such as the use of steroids, which have a variety of adverse effects, including changes in metabolic processes, appetite, and weight gain. Chronic urticaria typically has recurring bouts lasting more than 6 weeks. 70-95% of people with persistent urticaria are idiopathic. In some cases of chronic urticaria, antihistamines alone may not be effective in controlling symptoms. Patients may examine dietary changes and identify urticaria-causing foods. Chronic urticaria can be caused by both immunological and non-immunological factors, such as galactose-α-1.3-galactose in meat and Anisakis simplex in fish. Several foods consumed are reported to worsen symptoms of chronic urticaria, including alcohol, food additives, seafood, some fruits and vegetables, and fermented foods. Diagnosis and therapy for urticaria can be by changing the type of food that causes urticaria, oral provocation testing (OPT) or avoiding foods that cause urticaria.[3]

Foods that are high in histamine or that can activate mast cells via the non-immunological pathway and stimulate histamine release may cause urticaria. Cheese, fish, veggies, fruits, chocolate, and alcohol are all possible ingredients. Unlike acute urticaria, which is associated with food allergy, the mechanism of CSU is dosedependent, with a delayed pseudoallergic reaction to food coloring, artificial flavoring, or preservatives. Non-artificial natural components in food may also trigger pseudoallergic responses. Such reactions have been linked to well-established changes in stomach permeability. H1-antihistamine medications are typically used as the first line of treatment for CSU. According to guidelines, the second-line treatment involves

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increasing the dose of H1-antihistamine by up to fourfold, followed by an anti-IgE antibody (omalizumab) or immunosuppressive medications.[11]

CONCLUSION

In summary, there is evidence for the efficacy of diets in chronic urticaria (CU) in individual individuals with clinical symptoms, but there is little evidence for the usefulness of systematic diets in CU due to a lack of systematic double-blind controlled trials. In our daily practice, we advocate asking patients whether they can identify any specific food allergies in their diet. If this is the case, we recommend following a tailored diet that excludes these identified food allergies. If not, we don't advocate any diets.

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