

ORIGINAL RESEARCH

Prevalence of Iron and Vitamin D deficiency in chronic idiopathic urticaria

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ABSTRACT

Background: Urticaria is described as erythematous, cutaneous swellings of short duration, occurring as a result of vasodilation and dermal oedema. It consists of wheal and flare reaction which is characterized by localised intra cutaneous oedema. Urticaria is a distressing dermatologic condition which requires prolonged treatment and proper counselling of patient.

Aims & Objectives:

1. To study the clinico-epidemiological profile of patients presenting with chronic idiopathic urticaria.

2. To study and investigate serum ferritin and serum vitamin D levels in patients with chronic idiopathic urticaria.

Materials and Methods: A hospital based descriptive study was conducted among 80 subjects at a tertiary care teaching centre for a period of one and half year. The collected data was analysed using SPSS version 21.

Results: The mean age of the study subjects was 47.81 years, with 28.75% of them in >61 years of age followed by the age group of 41-50 years. 52.5% of total study subjects were males and 47.5% were females, with the male to female ratio of 1.1:1. We noted that out of 80 patients, Vitamin D deficiency was more common in chronic urticaria patients 81.25% (n=65) followed by Iron deficiency 56.25% (n=45).

Conclusion: In this study out of 80 chronic urticaria patients; 36 (45%) patients had both vitamin D and Iron deficiency. 29 (39%) patients had vitamin D and 9 (12%) patients had Iron deficiency respectively

Key words: Iron and Vitamin D, Chronic idiopathic urticaria

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INTRODUCTION

Urticaria, also known as hives is a dark red, elevated, itchy skin rash derived from latin word "urtica"¹. Urticaria is a distressing dermatologic condition. Although the wheals of urticaria are characteristically evanescent, lasting less than 24 hours, patients tend to have recurrent episodes². On applying pressure, the lesions blanch due to compression of dermal vessels. Urticaria is a disease of superficial dermis where venular plexus is present³. The urticaria has a point

prevalence of 0.1%. 15-20% of population is affected at some point in their lives. There is recurrence of attacks in 30% of urticaria patients.

Urticaria is classified into acute and chronic urticaria⁴. Acute urticaria is defined as presence of urticaria for less than 6 weeks and chronic urticaria is characterized by erythematous wheals highly itchy with or without angioedema, for at least 6-8 weeks and can persist for years.

Chronic urticaria (CU) is further divided into inducible urticaria and spontaneous or idiopathic urticaria⁵. CU is caused due to multiple etiologies- infective, psychological, autoimmune, physical, idiopathic and vasculitis⁴.

Although Vitamin D is well known by its central role in the bone physiology, it can exert several immunomodulatory actions in both innate and adaptive immunity primarily by affecting its nuclear (nVDR) and plasma membrane receptors (mVDR) on epithelial cells, mast cells, monocytes, macrophages, T-cells, B-cells and dendritic cells. Vitamin D is recognised to have a significant impact on mast cell proliferation, survival, differentiation and function in addition to its effect in other immune system components⁶⁻¹⁰. The mast cells, which are primarily in charge of causing allergic reactions, are also impacted by iron deficiency. Intradermal application of desferrioxamine, which is an iron binder induces local iron deficiency and results release of the histamine and wheal formation¹¹. Thus, the degree of iron repletion in mast cells establishes their priming state to release mediators like histamine.

Chronic urticaria is treated by avoiding the stimulus and by step-by-step approach starting from non-sedating H1 anti histaminic which are main drug of choice. In case of severe symptoms or if patient has angioedema, sedating antihistaminics are added¹². They can also be given in combination with H2 blockers, leukotriene inhibitors and immunomodulators.

There have been limited studies showing role of iron and vitamin D deficiency in chronic urticaria, hence we undertook this study to check prevalence of iron and vitamin D deficiency in chronic idiopathic urticaria.

Materials and Methods

Type of study: Hospital-based, prospective, observational study.

Place of study: Department of Dermatology, Venereology and Leprosy, Pacific Medical College & Hospital, Udaipur.

Period of study: The study was initiated after approval by the Institutional Ethics Committee for a period of one and half year from January 2021 to June 2022.

Source of data: Dermatology, Venereology & Leprosy Department of Pacific Medical College & Hospital, Udaipur-313001.

Sample size: 80 cases.

Methods

1. Institute Ethics Committee Clearance was obtained before the start of the study.
2. Written and informed consent was obtained from all patients.
3. A detailed history and clinical examination of patients having chronic urticaria was done.

4. Complete blood count, Peripheral blood smear and vitamin D levels were investigated in every patient and if further evaluation was required, serum ferritin levels were done.
5. Iron and vitamin D supplements were given to the patients having deficiency of iron and vitamin D in chronic idiopathic urticaria.

Eligibility criteria

Inclusion Criteria

- a) Patients with clinical features of urticaria for at least 6 weeks.

Exclusion Criteria

- a) Urticaria secondary to any other disease.
- b) Patients known to have received nutrient replacement.
- c) Patients with celiac disease or upper gastrointestinal tract surgery.

Results

In this study, 80 patients were included, age of patients ranged from 20 to 78 years with mean age of 47.81" 16.62 years. Majority of the patients (28.75%) belonged to more than 61 years of age group followed by age group of 41-50 years (22.5%). Out of the total study subjects, 52.5% were males and 47.5% were females with the male to female ratio of 1.1:1. In majority of patients (56.25%) duration of disease was between 0-2 years. Only 27.5% of the patients had disease for 3-4 years whereas 16.25% of the patients had the disease for a duration of more than 5 years. Mean duration of the disease was 2-3 years. (Table 1) In our study, most of the patients 43.75% were affected more in the summer season followed by winter season (22.5%). Majority of the patients (26.25%), did not have any aggravating factor for chronic urticaria and 21.25% patients reported stress as aggravating factor followed by food and physical stimuli (18.75%) and drug (8.75%).

Among 80 chronic urticaria patients, 74 patients were micronutrient deficient whereas 6 patients were normal. Out of 74 patients almost half of them 36 (48.65%) patients had both iron and vitamin-D deficiency. 29 (39%) patients had vitamin-D and 9 (12%) patients had Iron deficiency. (Table 2).

We observed that out of 45 iron deficient chronic urticaria patients, majority of them 12 (26.67%) belonged to > 61 years age affecting both genders equally followed by 10 (22.22%) patients in age group of 41-50 years with equal gender distribution. Iron deficiency had a little female preponderance 23 (51.11%) then males 22(48.88%) and affected older age predominantly.

(Graph1). Out of 65 vitamin-D deficient chronic Urticaria patients, males 36 (55.38%) were affected more than females 29 (44.62%). Majority of them 20 (30.77%) belonged to > 61 years age with a male preponderance. Vitamin-D deficiency in chronic urticariapatient affected mainly older age and males

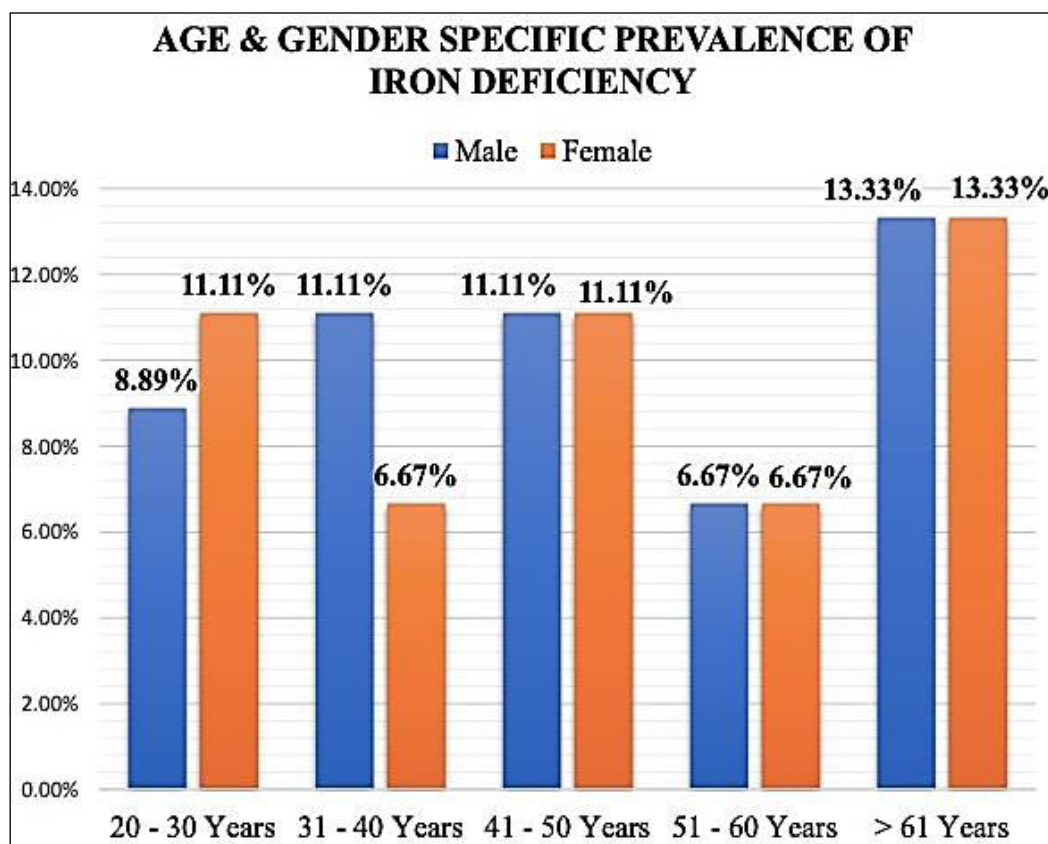
suffered more than females. (Graph 2). Out of 80 chronic urticaria patients 36 patients had both vitamin-D and iron deficiency. Majority of them 11 (30.56%) belonged to > 61 years age with male predominance. (Graph 3)

Table 1: Demographic data of patients with chronic urticaria

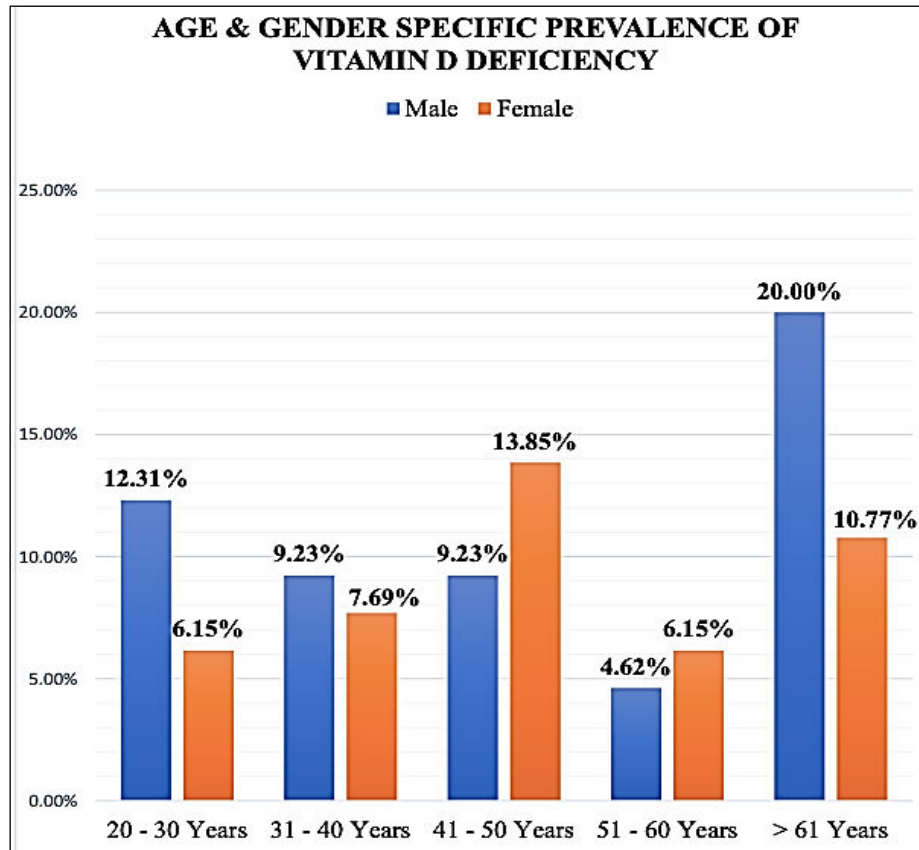
Patient's Data (Total 80)	Chronic Urticaria	
	Age	
21-30	16	(20%)
31-40	15	(18.75%)
41-50	18	(22.5%)
51-60	8	(10%)
>60	23	(28.75%)
	Gender	
Male	42	(52.5%)
Female	38	(47.5%)
	Duration of Symptoms	
0-2 years	45	(56.25%)
3-4 years	22	(27.5%)
≥5 years	13	(16.25%)
	Family History	
Positive	25	(31.25%)
Negative	55	(68.75%)

Table 2: Prevalence of micronutrient deficiency in Chronic Urticaria patients

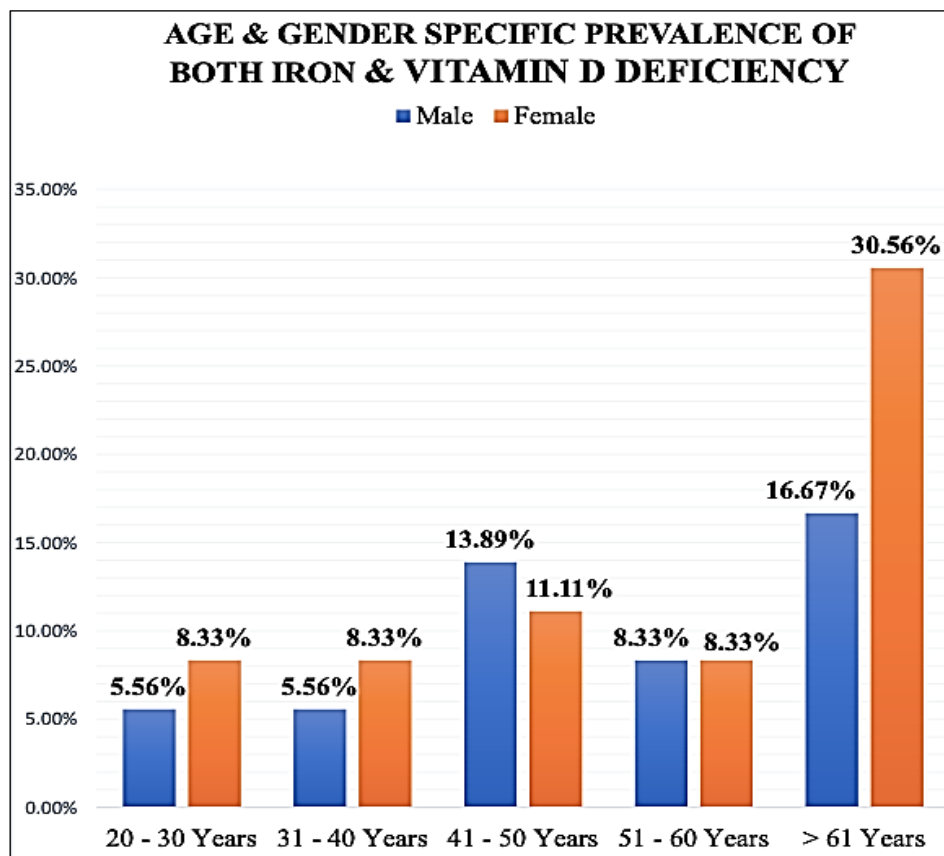
Micronutrient deficiency	Number	Percentage
Iron deficiency	9	12.16%
Vitamin D deficiency	29	39.19%
Iron and Vitamin D deficiency	36	48.65%
Total	74	100%



Graph1: Age and Gender specific prevalence of Iron deficiency in Chronic Urticariapatient



Graph 2: Age and Gender specific prevalence of Vitamin-D deficiency in Chronic Urticaria patients



Graph 3: Age and Gender specific prevalence of both Iron deficiency and Vitamin-D deficiency in Chronic Urticaria patients

Discussion

Chronic urticaria is frequently seen in routine dermatology practice. Chronic spontaneous urticaria is challenging to treat in many patients. It cannot be overstated how important it is to investigate the etiology of chronic urticaria because the disorder typically has a prolonged course and patients may experience symptom relief if a reason is identified.

In this study, 80 patients were included and mean age was 47.81 ± 16.62 years. Most of the patients 28.75% belonged to >61 years age group, our results are consistent with Anaba EL *et al.*¹³. (43 patients, mean age 40.6 ± 15.6 years). There was a little male predominance among all chronic urticaria patients included in the study. 52.5% were males and 47.5% females with a male-female ratio of 1.1:1.

According to the present study, most of the patients 43.75% were affected more in summer. Similar observations were made by Hirschmann *et al.*¹⁴. They noted worsening of urticaria in summer in 60% of their patients.

In majority of patients (56.25%) duration of symptoms was less than 2 years similarly, Kumar S. *et al.*¹⁵ documented the mean period of urticaria symptoms was 27.42 months. Our observations are consistent with Alexander K *et al.*¹⁶, Bong B *et al.*¹⁷ Bayazit E *et al.*¹⁸, they documented the period of sickness ranged from 2 months to 25 years.

According to the study, out of 80 patients both Iron and Vitamin D deficiency was more common in chronic urticaria patients 45% (n=36) followed by Vit-D deficiency 39% (n=29) and Iron deficiency 12% (n=9) similar to study by F. Guarneri *et al.*¹⁹, Wu CH *et al.*²⁰. In both studies Vit-D deficiency was more common than Vit-B12 and Iron deficiency.

In our study Vit-D deficiency was more common in CSU patients; this is in conformity with Boonpiyathad T *et al.*²¹, Chandrashekar L *et al.*²², Nasiri-Kalmarzi R *et al.*²³ all of them recorded CSU patients had significantly lower serum vitamin D levels than the normal controls.

The possible explanations for the old age predominance with equal gender distribution were ill-fitting dentures, restricted dietary intake and loss of tooth whereas in pre-menopausal age female predominance was noted this can be explained due to the various reasons, including change in dietary pattern and menstrual blood flow¹⁹.

In consideration of low cost and potential benefits for some patients, determination of serum levels of iron and vitamin D could be introduced in the diagnostic workup of chronic urticaria, maybe as a second-level test in patients without other relevant clinical or laboratory abnormalities¹⁹.

Conclusion

In this study the prevalence of both vitamin D and Iron deficiency among chronic urticaria patients was 45% (n=36) followed by vitamin D deficiency alone 39% (n=29). Vitamin D and Iron deficiency was

common in males and Iron deficiency alone was 12% (n=9) without gender predisposition.

We conclude that micronutrients like iron and vitamin-D deficiency were associated with chronic urticaria patients.

Conflict of interest: Nil.

Source of funding: Nil.

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