PATTERN OF PATCH TEST ALLERGEN POSITIVITY IN CHRONIC URTICARIA PATIENTS IN A TERTIARY CARE HOSPITAL IN TELANGANA

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ABSTRACT

CONTEXT

Patch test is the gold standard for detection of causative allergens in allergic contact dermatitis. Though chronic urticaria is a multifactorial condition, a sizeable number of such patients are thought to be due to various contact allergens. Hence, a hospital based prospective study of patch test positivity to various allergens was conducted in patients suffering from chronic urticaria.

AIMS

To evaluate the pattern of allergen positivity in chronic urticaria patients by patch test using Indian Standard Series.

SETTINGS & DESIGN

Prospective investigational study was conducted at Dermatology, Venereology and Leprosy department of a tertiary care hospital attached to a postgraduate training institute in Telangana state of India.

METHODS & MATERIAL

Thirty chronic urticaria patients, above 18 years of age were evaluated with patch test of Indian standard series. Two of these patients had prior history of contact sensitivity to rubber and paraphenylenediamine. Patch test was done by application of allergens of Indian standard series over upper back. Patch test site was examined after 48 hours and after 72 hours. Patch test was considered positive if erythema, erythematous papules or vesicles were found at the site of application of corresponding allergen.

RESULTS

Patch test was positive in 4 out of 30 patients of chronic urticaria, fragrance, black rubber mix, paraphenylenediamine and parthenium being the allergens in 1 patient each. Patients with positive patch test to black rubber mix and paraphenylenediamine had prior history of contact allergy.

CONCLUSION

Patch test is a simple, noninvasive, inexpensive and useful diagnostic test in a difficult to evaluate condition of chronic urticaria, irrespective of feasibility of avoidance of potential allergens.

KEYWORDS

Chronic Urticaria, Patch Test, Contact Allergens.

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INTRODUCTION: Urticaria is defined as a condition characterised by weals, which are intensely pruritic, transient, well demarcated, oedematous, erythematous or pale swellings of the dermis.[1] This common skin disease affects up to 30% of population at least once in their lifetime. It is arbitrarily classified into acute and chronic types depending on whether the duration is less than or more than 6 weeks respectively. Exact cause may not be found in up to 50% of chronic urticaria cases and hence known as chronic idiopathic urticaria (CIU). About half of such CIU cases may have an autoimmune basis (CAU – chronic idiopathic urticaria). In other chronic urticaria patients, there may be an association with foods, drugs, infections, infestations, implants, irritants, insect bites, etc. Although contact allergy is known to cause acute urticaria more commonly, several recent studies have shown that contact allergy to sensitisers like nickel, chromium, cobalt, balsam of Peru, rubber chemicals, etc. can play a role in the aetiopathogenesis of chronic urticaria also.[2-5] These studies have shown that testing for contact sensitisation can be helpful in the management of chronic urticaria, including especially chronic idiopathic urticaria.

Evaluation of chronic urticaria requires various diagnostic tests in view of multifactorial nature. Complete

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haemogram, complete urine examination, stool examination, etc are done to rule out any underlying infection or helminthic infestation. Absolute eosinophil count and serum IgE level can throw more light on allergic causes. Thyroid profile or autologous serum skin test (ASST) may help establish an autoimmune association (chronic autoimmune urticaria - CAU). In addition, physical urticarias need to be ruled out with the help of ice cube test (for cold urticaria), dermographometer (for dermographism) and similar provocation tests for pressure urticaria, cholinergic urticaria, solar urticaria, etc. In order to rule out food allergens, pseudoallergen testing may be employed. Contact allergens can be tested with skin prick test (SPT), oral challenge test, open test, repeat open application test (ROAT) etc.[6, 7] Patch testing is another simple, inexpensive method which can be valuable in identifying contact allergens as potential cause of urticaria, just as in case of allergic contact dermatitis, where it is the diagnostic test of choice. However, utility of identifying contact allergens in urticaria has been debatable. While some researchers have shown that chronic urticaria may improve when allergens identified based on patch testing are avoided by patients, others have questioned the feasibility of avoidance of allergens (like nickel) which may be ubiquitous in nature.[3,8] Nevertheless, patch test definitely helps in at least identifying potential contact allergens and reassuring the affected patients against "fear of the unknown" in a difficult to evaluate condition like urticaria, irrespective of whether avoidance is feasible or not. Hence, a prospective investigational study was conducted to evaluate the local pattern of patch test allergen positivity in chronic urticaria patients at Dermatology, Venereology and Leprosy Department of a tertiary care hospital attached to a postgraduate training institute in Telangana state of India.

MATERIALS & METHODS:

Objectives: To evaluate the pattern of allergen positivity in chronic urticaria patients by patch test using Indian Standard Series.

Study Design: Prospective investigational study.

Setting: Dermatology, Venereology and Leprosy Department of a tertiary care hospital attached to a postgraduate training institute in Telangana state of India.

Duration of the study: 2 years.

Patients: 30 patients (n=30) of chronic urticaria were included. The following criteria were used:

Inclusion Criteria:

a) Patients of chronic urticaria (urticaria lasting for more than 6 weeks in duration) were included in the study.
b) Patients of both sexes and above 18 years of age were included.
c) All chronic urticaria patients, irrespective of cause (known/unknown) were included.
d) All patients of chronic urticaria, irrespective of severity were included. In patients with severe urticaria (as per UAS- urticaria activity score), patch testing was done after initial control of severity of the disease.

Exclusion Criteria:

a) Patients less than 18 years of age.
b) Pregnant and lactating women.
c) Patients with history suggestive of laryngeal oedema, vasculitis, connective tissue disorders or other life threatening conditions.
d) Patients with history of severe adverse cutaneous drug reactions (Anaphylaxis, Steven-Johnson syndrome, toxic epidermal necrolysis, erythroderma, etc).

METHODS: A detailed history was obtained in all patients in order to find out the onset, duration, evolution, severity and triggering factors of urticaria. General physical, systemic & cutaneous examination was carried out in all patients to confirm the diagnosis of chronic urticaria and to rule out exclusion criteria. Appropriate investigations including complete haemogram, complete urine examination, stool examination, absolute eosinophil count, serum IgE, thyroid profile, etc were carried out wherever necessary. Thirty (30) patients fulfilling all the inclusion and exclusion criteria were selected and patch test was conducted in these patients.

Test Protocol: All patients selected for patch testing were instructed not to use systemic corticosteroids, immunosuppressives or any topical treatment except bland emollient/soothing lotion 1 week before the start of patch test. In addition, they were asked to stop antihistamines 3 days before the patch test. Purified allergens provided in the Indian Standard Series patch test kit (approved by Contact and Occupational Dermatoses Forum of India - CODFI) were applied over upper back of the patients in patch test strips consisting of Finn chambers (made of inert aluminium metal) mounted over hypoallergenic Micropore tape (figure 1 &2). The patches thus applied on the back were numbered to indicate various allergens in the patch test kit. The area was examined at 48 hours and at 72 hours to evaluate for patch test positivity. Patch test was considered positive for an allergen in case of presence of macular erythema, erythematous papules or vesicles at the site of corresponding patch test chamber applied. The findings were recorded in proforma. Patients were advised to avoid these potential allergens wherever feasible.

RESULTS: A total of 30 patients were enrolled in the study. Age of the patients ranged from 18 years to 54 years. Most patients belonged to 21-30 years age group (12 patients; 40%) followed by 31-40 years age group (11 patients; 36.66%) (table 1). Out of 30 patients, 19 (63.33%) were males and 11 (36.66%) were females (table 2). Occupation of the patient was business in 7 (23.33%), housewife in 5 (16.66%), labourer in 4(13.33%), construction worker in 4 (13.33%), student in 2 patients (6.66%) and teacher, clerk, driver, mason and tailor in 1 each patient (table 3). Duration of urticaria ranged from 2 months to 3 years, and 24 (80%) patients had duration of less than 1 year and 6 (20%) patients had duration of more than 1 year (table 4). There was history of contact allergy in 2 patients, history of atopy

in 2 patients and family history of urticaria in 1 patient (table 5). Autoimmune disease association was found in 3 patients and significant drug (NSAID) intake history prior to onset/aggravation of urticaria in 1 patient (table 5). Other aggravating factors as per patients' history were brinjal in 6 (20%) patients, green leafy vegetables in 2 (6.66%), and dry fruits, fish, egg, sunlight, pressure and upper respiratory tract infection in 1(3.33%) patient each (table 6).

Out of the total 30 patients evaluated with patch test, 4 (13.33%) patients showed positive test after 48 hours. Of this, 1 patient each tested positive to fragrance mix, black rubber mix, paraphenylenediamine (PPD) and parthenium (table 7). Patient with positive patch test for black rubber mix and the one with paraphenylenediamine had given prior history of allergy in the form of allergic contact dermatitis to footwear and hair dye respectively (table 7). None of the patients had patch test positive after 72 hours.

Fig. 1: Patch Test Kit – Indian Standard Series

Fig. 2: Patch Test Strips Applied over Upper Back of a Patient

Fig. 3: Patch Test Positive for Parthenium

Age Groups (years)	No. of Patients
1-10	0
11-20	3
21-30	12
31-40	11
41-50	3
51-60	1
61-70	0
Total	30

Table 1: Age Distribution (n=30)

Sex	No. of patients
Male	19
Female	11
Total	30

Table 2: Sex Distribution (n=30)

Occupation	No. of Patients
Business/vendor	7
Housewife	5
Labourer	4
Student	4
Farmer	3
Construction worker	2
Teacher	1
Clerk	1
Driver	1
Mason	1
Tailor	1
Total	30

Table 3: Occupation (n=30)

Sl. No.	Duration	No. of Patients
1	< 1 year	24
2	> 1 year	6

Table 4: Distribution of Patients by Duration of Illness (n=30)

Sl. No.	Significant History	No. of Patients
1	History of contact allergy	2 (rubber, hair dye)
2	Atopy	2
3	Family history of urticaria	1
4	Autoimmune diseases	3
5	Drug history	1

Table 5: Significant History (n=30)

Sl. No.	Perceived Aggravating Factor	No. of Patients
1	Brinjal	5
2	Brinjal & Gongura	1
2	Gongura	1
3	Dry fruits	1
4	Drugs	1 (NSAID)
5	Fish	1
6	Egg	1
7	Sunlight	1
8	Pressure	1
9	Infections	1 (URTI)
	Total	14

Table 6: Aggravating Factors as Perceived by Patients (n=30)

Sl. No.	Patch test positive	No. of patients	Occupation	Prior history of contact allergy to same allergen
1	Fragrance mix	1	Student	No
2	Black rubber mix	1	Construction worker	Yes (footwear)
3	Paraphenylenediamine (PPD)	1	Driver	Yes (hair dye)
4	Parthenium	1	Farmer	No
	Total	4		

Table 7: Patch Test Positivity at 48 hours (n=30)

DISCUSSION: Urticaria is a common skin disease which affects up to 30% of population and causes considerable discomfort due to intensely pruritic weals or hives. The patients' quality of life is affected especially in those having chronic urticaria lasting for more than 6 weeks.[9] With the exception of those cases where predisposing factors such as foods, drugs, infections, infestations, implants, irritants, insect bites, autoimmune disease association, etc. can be identified, exact cause may not be found in up to 50% of chronic urticaria cases, known as chronic idiopathic urticaria (CIU). In such cases especially, the patient is mentally distressed in view of the unknown causation and uncertain prognosis. Such patients definitely look forward to whichever available test to evaluate the likely cause. Besides other investigations, patch testing will be very useful for identification of potential allergens in these cases. Several studies have shown contact allergy to sensitisers like nickel, chromium, cobalt, balsam of Peru, rubber chemicals in patients of chronic urticaria.[2-5] Some of these studies have shown that testing for contact sensitisation and subsequent avoidance of these allergens can be helpful in the management of chronic urticaria, just as in case of allergic contact dermatitis.[3]

Patch test is the gold standard investigation in identifying causative allergens in allergic contact dermatitis. Attempts have been made to utilise this simple, inexpensive, noninvasive test in other conditions like drug rashes like maculopapular drug rash, Steven-Johnson syndrome and toxic epidermal necrolysis caused by antiepileptic drugs.[9] Similar attempts have been made to utilise this test in evaluation of chronic urticaria. Warin et al found positive patch test to balsam of Peru, cinnamon and nickel in many of the 56 patients of chronic urticaria patients studied.[5] Guerra et al tested the hypothesis of contact allergy in chronic urticaria with Italian series of patch tests.[2] They found patch test positivity in 41% of the total 121 patients with chronic urticaria, all of whom showed complete remission of urticaria within a month on avoidance of allergens. Similarly, Sharma found positive patch test in 11 out of 57 patients.[3] Out of these 11 patients with positive patch test, 9 showed complete recovery and 2 had partial recovery from chronic urticaria on avoidance of allergens. However, relevance of these findings was questioned by Godse and Verma, who felt avoidance of few ubiquitous allergens such as nickel was not feasible.[9, 10]

In the current study, chronic urticaria patients (duration ranging from 2 months to 3 years) of all age groups above 18 years of age, both genders and diverse occupational background such as housewives, students, labourers, farmers, construction workers, etc. were patch tested for allergen sensitivity (tables-1 to 4). The type of potential allergens varies depending upon lifestyle and occupation of the patients. Two patients had prior history of contact sensitisation in the form of allergic contact dermatitis to rubber and hair dye. History of atopy, autoimmune disease and family history of urticaria was found in few patients (table 5). Aggravating factors such as food agents, drugs (NSAIDs), sunlight, pressure and infections were found in 14 patients (table 6), while the rest 16 had no known contributory or aggravating factor for urticaria (chronic idiopathic urticaria). Four patients showed positive patch test when observed at 48 hours after application of patches, 1 each to fragrance mix, black rubber mix, paraphenylenediamine and parthenium (table 7, figure 3).

The patient with positive patch test to fragrance mix was a student, who had history of using deodorants and perfumes. Similarly, parthenium allergy was found in a farmer, which could be attributed to his occupational exposure to Parthenium hysterophorus plant which is an ubiquitous weed growing in waste lands and farmlands across India, being the commonest cause of allergic contact dermatitis in India. However, there was no occupational correlation in the other 2 patients with positive patch test, rubber allergy seen in construction worker probably being rather due to footwear and paraphenylenediamine being positive in a driver with a prior history of hair dye contact dermatitis. Two patients with positive patch test to black rubber mix and paraphenylenediamine (PPD) with a prior history of contact dermatitis to rubber footwear and PPD mixed hair dye. However, the other 2 urticaria patients (positive for fragrance mix and parthenium) did not have history of contact eczema. Contact dermatitis occurs due to cell mediated (type IV) hypersensitivity, whereas urticaria can occur due to all 4 types of hypersensitivity, although immediate (type I) hypersensitivity is the most common mechanism. Occurrence of both urticaria and contact dermatitis in 2 patients is a unique finding of this current study.

In this study, patients found to be positive for patch test were advised to avoid the potential allergens far as possible, but they were not followed up for observing complete/partial remission, unlike in the study by Sharma.[3] Sharma's observation of such high remission was contested by Godse and by Verma, on the grounds that avoidance of allergens such as nickel was not feasible.[8,] Nevertheless, patch test definitely helps in at least identifying potential contact allergens and reassuring the affected patients against "fear of the unknown" in a difficult to evaluate condition like urticaria, irrespective of whether avoidance is feasible or not.

CONCLUSION: Patch test is a simple, noninvasive, inexpensive diagnostic test, which is not only a gold standard in identification of allergens in allergic contact dermatitis, but also a useful diagnostic tool in a difficult to evaluate condition of chronic urticaria.

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