International Journal of Research in Dermatology
Hogade AS et al. Int J Res Dermatol. 2019 May;5(2):357-360
http://www.ijord.com

DOI: http://dx.doi.org/10.18203/issn.2455-4529.IntJResDermatol20191762

Original Research Article

Clinico-epidemiological study of role of patch test in hand eczema

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Received: 14 December 2018
Revised: 10 February 2019
Accepted: 13 February 2019

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ABSTRACT

Background: Hand eczema is a common distressing condition in different occupational groups caused by various endogenous and exogenous factors. It appears to be the most common occupational skin disease, comprising 80% or more of all occupational contact dermatitis. Patch test at present is the only scientific method to diagnose the contact allergen and in subsequent management of patient.
Methods: An observational study of patch test was conducted on 100 patients of hand eczema in the department of DVL, Basaveshwara Teaching and General Hospital, Kalaburagi. After detailed history and complete examination, patch testing was done using Indian Standard Series and graded by International Contact Dermatitis Research Group criteria at 48 hours and 72 hours.
Results: Out of 100 patients, there were 28 females and 72 males. The commonest age group seen was 20-40 years followed by 40-60 years. Commonest sensitizers were to potassium dichromate (34%) followed by nickel (18.7%), Parthenium (12.5%), PPD (7.8%), other (26%). Out of 64 patients who were positive, 82.8% were positive to single allergen, 10% to two allergens and 6.2% to multiple allergens.
Conclusions: Patch test is considered as gold standard method for diagnosis of allergic contact dermatitis and thus preventing the morbidity of repeated episodes of eczema.

Keywords: Hand eczema, Patch test

INTRODUCTION

Hand eczema is a common dermatologic disorder that affects all age groups. Hand eczema implies that the dermatitis is largely confined to hands, with minor involvement of other areas. If the eczema is widespread and hands appear to be involved coincidentally, it is preferable to speak of hand involvement rather than hand eczema.[1] Its a common and distressing condition, and has a particular impact on quality of life due to its effects on dexterity, appearance and social functioning.[2] Hands have been the affected site in 80% of occupational skin disease.[3]

Eczema can be exogenous or endogenous. Exogenous eczema consists of mainly contact allergic dermatitis and contact irritant dermatitis. Hand is involved in one third of eczema patients.[4] It affects 1% of adults.[5]

Incidence is considerably higher among certain occupational groups engaged in wet work.[6] In most surveys, hand eczema is more common in females than in males in ratio of about 2:1.[7]

The lifetime prevalence rate varied between 5.7% and 16.7% for women and between 5.2% and 9.5% for men in large study.[8] As clinical differentiation between chronic allergic and irritant hand eczemas is often impossible, patch testing becomes an important diagnostic tool for identification of the allergen/allergens responsible for the eczema.[9]

Jadassohn introduced patch testing in 1896 as diagnostic procedure for contact dermatitis.[10] In patch testing, the suspected substance is applied to the skin under an occlusive dressing for 2 days and then observed. It's the only practical test for demonstrating cause of contact dermatitis. This study was conducted to identify the various presentations of hand eczema, to find most common allergen.

METHODS

A Prospective study was conducted in department of dermatology, Basaveshwara teaching and general hospital, Kalaburagi from November 2016 to October 2018. A total of 100 patients were included in the study after a valid consent. Patients >18 years of age with any morphological variant of hand eczema were included in our study and those with wide spread eczema in other areas of body, on steroids and immunosuppressive agents for other disease, pregnant and lactating mothers and patients with concurrent fungal, bacterial infections, psoriasis, and other dermatosis affecting hand were excluded. Data collected was analysed by SPSS 16.0 version software using descriptive statistics namely tables, percentages.

A complete clinical examination was carried out in all patients and details about the nature, extent and morphology of lesions were carefully noted down. Routine investigations were done. The patients were later subjected to patch testing, after obtaining their consent using Indian standard battery approved by contact and occupational dermatoses forum of India (CODFI), manufactured supplied by Systopic laboratories, New Delhi.

Procedure of patch testing

Preparation of the patient

The patch test procedure and common side effects were explained to the patients and informed consent was taken in every case.

A clean bath was advised before coming. Any hair on the back was advised prior removal with razor (without use of shaving creams or soaps).

The back of the patient was ensured of absence of any dermatitis. An interval of at least a fortnight was ensured following treatment of a dermatitis involving the back to avoid false positive results.

The back was prepared by gentle cleaning with spirit avoiding excess rubbing.

Preparation of patch

Antigens were placed in aluminum finn chambers in prescribed sequence by an amount filling it slightly more than one-half full (about ½ to 1 mm length from the syringe) without bringing any excess allergen to the rim of the chamber. These aluminum chambers have an internal diameter of 9 mm and a depth of 0.7 mm and a volume of 4.3 ml; ten such were placed facing up with a 2 cm distance from the center of each other in two columns.

The following patient instructions were given:

1. Not to take bath till the patches are opened.
2. To avoid exercise or any other activity causing sweating.
3. To avoid exposure to sunlight/UV light.
4. To avoid tight under clothes.
5. To avoid lying on the back in sleep but reclining on the back was permitted.
6. Not to disturb the patches by scratching and report immediately in case of severe itching or irritation.

The patches were removed on day 2 i.e. after 48 hours and skin markings at the edges of the patches reinforced. Readings were taken after 30 minutes with instructions to avoid leaning against chair while sitting to allow pressure effects of patches to wane. Second reading was taken at 72 hours and observations were noted as below.

Interpretation of reactions

The patch test reactions were graded according to the recommendations of the international contact dermatitis research group (ICDRG).

Table 1: International contact dermatitis research group criteria.

Symbol	Interpretation	Morphology
+?	Doubtful reaction	Faint erythema only
+	Weak positive reaction	Erythema, infiltration, possibly papules
++	Strong positive reaction	Erythema, infiltration, papules, vesicles
+++	Extreme positive reaction	Erythema and infiltration and coalescing vesicles
-	Negative reaction	No changes
IR	Irritant Reaction	No induration

Where reactions were doubtful even at 72 hours, a further 'late' reading was taken 7-10 days later.

RESULTS

Out of 100 patients, 28 were females and 72 were males. The commonest age group seen was 20-40 years (57%) followed by 40-60 years (36%). Commonest sensitizers were to potassium dichromate (34.3%) followed by nickel (18.7%), parthenium (12.5%), PPD (7.8%), other allergens (26%). Out of 100 patients 64% were positive on patch testing. Among them 82.8% were positive to single allergen, 10% to two allergens and 6.2% to multiple allergens. Among the different morphological variants presented, patchy vesiculosquamous type (25%) was the commonest variant noted followed by focal palmar peeling 18%, pompholyx (14%).

Table 2: Various morphological variants seen.

Morphology	Female	Male	Total
Pompholyx	4	10	14
Recurrent focal palmar peeling	2	16	18
Ring eczema	-	4	4
Fingertip eczema	3	8	11
Apron eczema	1	-	1
Discoid eczema	-	6	6
Chronic acral eczema	-	-	-
Gut eczema	-	-	-
Patchy vesiculosquamous eczema	7	18	25
Wear and tear dermatitis	11	1	12
Hyperkeratotic palmar eczema	-	9	9

Figure 1: Strong positivity.

Figure 2: Patchy vesiculosquamous eczema.

Table 3: Allergens used.

Antigen	Male	Female	%
Potassium dichromate	19	3	34.3
Neomycin	1	-	1.5
Cobalt	3	-	4.6
Parabens	1	-	1.5
Colophony	1	-	1.5
Balsam of peru	3	1	6.2
Formaldehyde	2	-	3.1
Nickel	9	3	18.7
Gentamycin	-	-	-
Nitrofurazone	1	-	1.5
Black rubber mix	1	-	1.5
Paraphenylenediamine	4	1	7.8
Parthenium	7	1	12.5
Wool alcohol	-	-	-
Thiuram mix	-	-	-
Benzocaine	-	-	-
Fragrance mix	-	1	1.5
Vaseline	-	-	-
Epoxy resins	1	1	3.1
Chlorocresol	-	-	-

DISCUSSION

Hand eczema is a chronic disorder and may result in a considerable physical and occupational morbidity along with psychosocial embarrassment.

In our study 72% were males and 28% were females. This was similar to study by Sharma et al have shown a higher incidence in males.[8] On other hand female preponderance was noted in study by singh et al.[10] Patients of age group 20-40 years (57%) are commonly involved. Similar observation was seen by Bajaj et al.[11] Preponderance of hand eczema in this age group is because they are usually employed resulting in frequent exposure to various irritants and allergens in environment.

Occupations with high risk are those working as mason construction workers, agricultural workers, mechanics, engineers, paramedical personnel, housewives where exposure to irritants and allergens is frequent.

Among females 15% patients were housewives. They are prone to contact with various chemicals, detergents, cosmetics, bleaches and other substances which may act either as irritants or allergens. A high incidence of housewives was also reported by Bajaj.[11]

Clinical features of HE may vary from minimal patchy dermatitis to widespread involvement of entire hands depending upon nature of irritants/allergens, duration and extent of exposure, atopic diathesis and underlying skin condition. Pruritus was the common symptom seen in

86% of patients followed by redness (21%), pain (7%), fissuring (18%), oozing (34%), and pigmentation (64%).

Majority of patients in our study presented with duration of 3-6 months (46%). In a study by Bajaj et al duration of symptoms was found to be 6 months in about 60% cases.[11]

20% of patients had a personal and 8% had a family history of atopy and 5% had both personal and family history. Hanifen and Rajka have included hand eczema as one of the minor diagnostic criteria for atopic dermatitis.[13]

Patchy vesiculosquamous eczema was the commonest type of eczema encountered (25%), keratolysis exfoliativa (18%), pompholyx (14%), wear and tear dermatitis (12%).

In our study 64% of patients showed positive patch test results. 10% were sensitive to two antigens and 6 % to multiple allergens. Potassium dichromate was the commonest sensitizer seen in 34.3%. Nickel was second most common allergen positive in 18.7%. Other allergens which were positive include parthenium (12.5 %) patients, PPD (7.8%), balsam of peru (6.2%), cobalt (4.6%), neomycin (1.5%), and formaldehyde (3.1%). Shenoi et al found higher incidence of chromate sensitivity 11.3% in comparison to nickel as with present study.[12]

Nickel accounted for 18.7% in our study which was low compared to study by sharma and kaur in which the incidence was 40%.[8] Dermatitis due to parthenium was observed in 12.5% patients which was similar to study by Bajaj.[11]

CONCLUSION

Hand eczema a common chronic distressing condition affecting individuals of various occupations, comprising of 9-35% of all occupational diseases. Patch test using Indian standard battery of allergens is gold standard for determining responsible allergen and may help in reducing incidence and recurrence of hand eczema.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Hogade AS, Anusha P. Clinico-epidemiological study of role of patch test in hand eczema. Int J Res Dermatol 2019;5:357-60.