

**PATCH TESTING AND CLINICAL EVALUATION IN HAND ECZEMA****Dr. Thakar Rajendra Kirtikumar**

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**ABSTRACT****BACKGROUND:**

Hand eczema is a common and often painful skin illness because of its extensive etiology, prolonged cause, remissions and exacerbations, resistance to medication, and distinct anatomical features of the palmer skin. It was initially described in the nineteenth century, most likely. It's a widespread problem that impacts people in many different fields of work. Between 2% and 10% of people will probably get hand eczema at some point in their lives. Most occurrences of hand eczema have a multifactorial etiology, meaning that exogenous causes induce and prolong the eczema in individuals who are already prone to such processes due to endogenous factors.

**MATERIAL AND METHOD:** The dermatology department was the site of this cross-sectional study. The outpatient clinic of the dermatology department saw a total of one hundred patients with hand eczema. Following informed consent, a proforma was used to document every patient's full medical history, including employment, duration of complaints, pruritus, history of personal or occupational chemical exposure, history of atopy, recurrences, aggravating factors, and treatment history.

**RESULTS:** Out of 100 patients, major occupations among them were housewives 27%, followed by masons 22 %, farmers 10 %, mechanics 7 %, students 5 %, software engineers 6 %. Hyperkeratotic palmar eczema was the most common morphology observed in 53 of the patients followed by 19 fingertip eczema, 11 discoid eczema, 7 wear and tear dermatitis, 5 pompholyx, 5 recurrent focal palmer peeling. Nickel was the most common allergen in our study 27 followed by potassium dichromate 10, parthenium 6, cobalt and nickel 3, fragrance mix, formaldehyde and black rubber mix showed positive reaction in two patients each

**CONCLUSION:** Patients with hand eczema in our study typically ranged in age from 21 to 60. Farmers, masons, housewives, and mechanics are more likely to develop hand eczema. Hyperkeratotic palmar eczema was the most common morphological kind of eczema, followed by fingertip eczema. The most common result of the nickel patch test was positive, especially in housewives. Among masons, potassium dichromate-containing cement is the most common cause of allergies. Most people with pompholyx have had atopy in the past. The workplace may exacerbate this specific type of hand dermatosis.

**KEYWORDS:** Hand eczema, Patch test, Allergens, Nickel and Potassium Bichromate.

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**INTRODUCTION**

When dermatitis is called hand eczema, it means that other parts of the body are only mildly impacted. There could be endogenous or exogenous causes. Most instances have a multifactorial etiology, which includes allergic contact dermatitis. A patch test is an essential diagnostic technique for identifying the allergens causing the eczema, which can be physically and emotionally incapacitating, because it can be difficult to discern between irritating and chronic allergic hand eczema. Therefore, identifying and

avoiding external allergens is necessary for the management and treatment of hand eczema. Patch testing, when done in a clinical setting, can mimic allergic contact dermatitis by using allergens suspended in a medium at a concentration that isn't irritating. The patch test is the sole scientific investigation that substantiates the diagnosis of allergic contact dermatitis.<sup>1</sup>

A prevalent, painful chronic illness that can afflict people in a range of professions is hand eczema. Between 2 and 10% of people will at some point in their lives experience hand eczema, which is a

prevalent ailment. It accounts for 9–35% of all occupational diseases and is one of the most common skin conditions at work. Up to 80% of instances of occupational contact dermatitis can have hand eczema. Among the three most common disorders at work is this one. Patients with skin diseases experience physical and psychological anguish on par with those with other chronic conditions such as multiple sclerosis and migraines. Only 18% of individuals show symptoms of clinical depression.<sup>2</sup>

Furthermore, 20% to 35% of cases of dermatitis involve the hands. It seems to be the most common skin ailment at work, accounting for 9% to 35% of all occupational illnesses and up to 80% or more of all occupational contact dermatitis. Male involvement is lower than that of female involvement (2:1), which may be related to greater exposure to home chemicals and wet jobs. The environment of the twenty-first century has become increasingly complicated and industrialized, making it even more important to determine the exact etiology of the disease and to utilize the best preventive and therapeutic techniques. Out of the over 6 million chemicals that are now in the environment, at least 2,800 have been found to have contact-sensitizing properties.<sup>3</sup>

Many occupational groups are prone to hand eczema due to frequent contact with various allergens and irritants, depending on the nature of their work. Working in the medical field puts professionals at risk for occupational hand dermatitis and eczema. This may be the result of prolonged wet labor, which frequently necessitates hand cleaning procedures required in hospital employment to prevent nosocomial infections and has been shown to double the frequency of hand dermatitis compared to dry office work.<sup>4,5</sup>

Hand eczema can have a variety of endogenous or exogenous etiologies. Allergy and irritant contact dermatitis may coexist in exogenous hand eczema. Irritating contact dermatitis is assumed to be more common than allergic contact dermatitis. Hand eczema affects women twice as frequently as it does men, most likely due to increased exposure with damp work and domestic contaminants. The increased incidence of atopic dermatitis in women may also have a role.<sup>6,7</sup>

One of the most important diagnostic tools for identifying the allergen or allergens causing eczema

is the biological test known as the patch test. A patch test acts as a provocation test as well as a screening test on the target organ's skin. Several studies have demonstrated that this population's susceptibility to hand eczema is increased by some intrinsic factors (such as atopic dermatitis) in addition to these environmental ones. It has been found that due to underlying immune system and skin barrier problems, atopy worsens this sensitivity.<sup>8</sup>

#### **MATERIAL AND METHODS**

The dermatology department was the site of this cross-sectional study. The outpatient clinic of the dermatology department saw a total of one hundred patients with hand eczema. Following informed consent, a proforma was used to document every patient's full medical history, including employment, duration of complaints, pruritus, history of personal or occupational chemical exposure, history of atopy, recurrences, aggravating factors, and treatment history. Recorded were the final diagnosis, the treatment plan, and particular examination results pertaining to the morphology and affected area. Every patient was provided with comprehensive instructions on patch testing prior to doing the test. A questionnaire was made including questions concerning job title, daily work hours, if wet work was done, contact with gloves, disinfectants, sanitizers, and equipment, as well as demographic parameters (age, sex, and place of residence). Other questions included the history of atopy/atopic dermatitis and the existence of any skin abnormalities on the hands.

#### **Inclusion criteria:**

- The patients having hand eczema for at least 4-week duration aged more than 18 years and both sexes who give valid informed consent were included in the study

#### **Exclusion criteria:**

- Patients with concurrent fungal, bacterial infections, psoriasis, lichen planus, and other hand-specific dermatoses, patients with widespread eczema in other parts of the body, pregnant women, lactating mothers, history of any associated systemic disease, and patients with a history of excessive alcohol consumption were all excluded from the study.

#### **STATISTICAL ANALYSIS**

Statistical analysis was done using SPSS version 22.0 was used to analyze the data. To compare the

proportions Chi-square test was applied. If any expected cell frequency is less than five, Fisher's exact test was used to calculate the p-value.

**RESULT:**

Out of 100 patients, major occupations among them were housewives 27 (27%), followed by masons 22 (22%), farmers 10 (10%), mechanics 7 (7%), students 5 (5%), software engineers 6 (5%).

**Table 1: Occupation of the study group**

Occupation	N	%
Housewife	27	27
Mason	22	22
Farmer	10	10
Mechanic	7	7
Student	5	5
Teacher	4	4
Hotel worker	3	3
Housekeeping staff	2	2
Software engineer	6	6
Plumber/electrician/welder	5	5
Staff Nurse	3	3
Printing work	3	3
Others	3	3
<b>Total</b>	<b>100</b>	<b>100.0</b>

**Table 2: Morphological patterns of hand eczema**

Morphological diagnosis	N	%
Hyperkeratotic hand eczema	53	53
Fingertip eczema	19	19
Discoid eczema	11	11
Wear and tear dermatitis	7	7
Recurrent focal palmar peeling	5	5
Pompholyx	5	5
<b>Total</b>	<b>100</b>	<b>100.0</b>

Hyperkeratotic palmar eczema was the most common morphology observed in 53 of the patients (53%) followed by 19 fingertip eczema (19%), 11 discoid eczema (11%), 7 wear and tear dermatitis (7%), 5 pompholyx (5%), 5 recurrent focal palmer peeling (5%).

**Table 3: Patch test results in the study group.**

Patch test result	N	%
Negative	37	37
Nickel	25	25
Potassium dichromate	13	13
Parthenium	6	6
Cobalt, Nickel	4	4
Fragrance mix	3	3
Formaldehyde	2	2
PPD	3	3
Black rubber mix	2	2
Epoxy resin	1	1
Cobalt	1	1

Balsam of Peru	1	1
Neomycin	1	1
Mercaptobenzothiazole	1	1
<b>Total</b>	100	100.0

Nickel was the most common allergen in our study 25% followed by potassium dichromate 13%, parthenium 6%, cobalt and nickel 4%, fragrance mix, formaldehyde and black rubber mix showed positive reaction in two patients each (totaling to 7%). Epoxy resin, balsm of Peru, cobalt, neomycin, and mercaptobenzothiazole showed positive reactions in one patient each (totaling to 5%).

## DISCUSSION

Apart from a greater proportion of other professional populations, a considerable portion of the world's population suffers from hand eczema. The frequency and clinical patterns in various professional groups are influenced by the extent and duration of exposure to several triggers, in addition to the presence or absence of underlying innate vulnerability. Over time, it has become more important as a serious occupational dermatosis due to its socioeconomic repercussions, which directly affect the patient's quality of life.<sup>9,10</sup>

The Indian study by **Kishore et al., 2005**<sup>11</sup> reported the commonest occupational group among females was the housewives, as in our study. This may be because of the increased risk of contact with a variety of agents during household chores like cooking, cleansing, and washing, which may act as irritants or allergens in addition to the trauma of rubbing and scrubbing. In other studies, done by **Suman et al. 2003**<sup>12</sup> and **Laxmisha et al.2008**<sup>13</sup> a higher percentage of masons similar to our study was reported this might be due to the growth of the construction industry in our region.

In the study by **Kishore et al., 2005**<sup>11</sup> the positive patch test was seen in 82% of the patients, and Potassium dichromate was the most common sensitizer testing positive in 26% of the patients while nickel was the next most common testing positive in 18% of the patients. A study by **Kaur and Sharma 1987**<sup>14</sup> in Chandigarh found that 53.1% of the patients with hand eczema were sensitive to metals. Of these, nickel, cobalt, and chromate sensitivity were seen in 40.6%, 31.2%, and 21.8% of patients respectively. Nickel sulfate was also the

commonest sensitizer in various international studies.

Nickel as an important causative factor in hand eczema has also been reported in earlier studies done by **Bajaj et al 2007**<sup>15</sup>. Nickel is present in objects such as door knobs, bags, and umbrellas, and paper pins, and clips, etc. Stainless-steel cutlery can absorb it through sweat, soaps, or detergents. When patients with a clinically significant positive patch test avoided the allergen or antigen (construction workers, for example, bichromate), their symptoms improved; nevertheless, when they were exposed to the allergen or antigen again, their clinical features deteriorated. Their precarious financial circumstances prevented them from changing careers or professions.

Housewives, farmers, drivers, mechanics, and engineers are among those who are more likely to acquire allergic hand eczemas than the general population, which makes sense given their higher exposure to allergens. Numerous studies yielded comparable findings.<sup>16,17</sup> This group of people may be more susceptible to hand eczema because of greater exposure to moist work environments, detergent use, and jewelry wear. The fact that people with a history of detergent exposure had positive patch test findings for nickel, cobalt, and PPD shows that detergents are a major source of sensitization.<sup>18</sup> In wet work environments, lipid-soluble chemicals are frequently added to water to get the desired cleaning result. These chemicals wash away the lipids inside the cells. Lipid loss results in structural and physiochemical alterations in the skin that seem to exacerbate cutaneous irritation.<sup>19</sup> High frequency of atopic dermatitis among women may also contribute.

## CONCLUSION:

Patients with hand eczema in our study typically ranged in age from 21 to 60. Farmers, masons, housewives, and mechanics are more likely to develop hand eczema. Hyperkeratotic palmar eczema was the most common morphological kind of eczema, followed by fingertip eczema. The most common result of the nickel patch test was positive,

especially in housewives. Among masons, potassium dichromate-containing cement is the most common cause of allergies. Most people with pompholyx have had atopy in the past. The workplace may exacerbate this specific type of hand dermatosis. Consequently, quick therapy, careful clinical examination, and patch testing can help these professionals feel better. Effective workplace prevention counseling can also help reduce the incidence of hand eczema and the morbidity associated with it in those who already have it.

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