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Original Research Article

Study of clinical profile and association of severity with contact sensitivity of hand eczema patients

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ABSTRACT

Background: This present study was to evaluate the clinical profile, severity and its pattern as well as association between contact sensitivity with its severity in hand eczema patients.
Methods: A detailed demographic profile, occupation, history regarding onset of disease, duration, progress of hand dermatitis, aggravating and relieving factors, seasonal variations, presence of atopy in self or family, day to day work, hobbies, and past and present treatment were performed to all cases of hand eczema. Severity of hand eczema was assessed by using hand eczema severity index (HECSI). Patch test was applied to all cases with standard Indian patch test battery as approved by contact dermatitis and occupational dermatoses forum of India. Data was applied by using SPSS version 26 software. P value was taken equal to or less than 0.05 for significant differences.
Results: Hand eczema was commonly seen in male and middle age group (31-45 years) patients. Masons, house wives and farmers were mostly infected with hand eczema. Hyperkeratotic eczema and wear and tear dermatitis were the most common type of hand eczema. Potassium dichromate and nickel were the most common antigen/allergens. HECSI score 40-60 was seen in majorities of hand eczema cases. And there was no statistical significant association seen in between severity and positive patch test sensitivity in patients with hand eczema.
Conclusions: Works associated with exposure to various chemical agents are at higher risk for developing hand eczema. Our study will of immense help to patients for identification of contact sensitizer and prevention from hand eczema.

Keywords: Hand eczema, Patch test, Severity, Contact sensitivity

INTRODUCTION

Hand eczema is a common distressing condition giving rise to a lot of emotional and physical morbidity. Its one year prevalence in the general population has been assessed to be 9.7%.[1] It is one of the most common dermatological disorders caused by various exogenous and endogenous factors.[2] Exogenous factors include contact irritants (chemical and physical), contact allergens (delayed and immediate hypersensitivity types), ingested allergens, infections and secondary dissemination.[3]

Hand eczema is the most common form of occupational skin disease.[3] Occupations, which involve wet work and exposure to various chemical agents, like masons, industrial workers, farmers, labourers are at higher risk for developing hand dermatitis.[4] There are various morphological patterns of hand eczema like hyperkeratotic palmar eczema, pompholyx, recurrent focal palmar peeling, housewives eczema, fingertip

eczema, ring eczema, apron eczema, chronic acral dermatitis and gut eczema. Hand eczema is often wrongly diagnosed as other skin dermatoses such as psoriasis and dermatophytosis.[5]

In eczema, the patch test is gold standard test in detecting the etiologic factor and the only scientific proof of contact allergy. A positive reaction to a correctly prepared and applied patch test confirms the person has allergic contact sensitivity, although this doesn't necessarily mean that the substance is the cause of presenting clinical dermatitis and its relevance should always be carefully considered. Objectives of our study were to evaluate the clinical profile, and association of severity and contact sensitization with its pattern of patients with hand eczema.

METHODS

This present study was conducted in Department of Dermatology, Madhubani Medical College and Hospital, Madhubani, Bihar, INDIA during a period from January 2019 to July 2019. Entire subjects signed an informed consent approved by institutional ethical committee of Madhubani Medical College was sought.

A total of 100 patients of hand eczema with age group 15 years to >60 years with irrespective of sex were enrolled in this study. A random sampling method was used for data collection.

Detailed history, clinical examinations and relevant investigations were performed to all cases of hand dermatitis.

Patients with acute hand eczema were enrolled after acute episode had subsided and those on systemic steroids were included after daily dose had been reduced to less than 20 mg of prednisolone. Exclusion criteria included pregnancy, primary irritant contact dermatitis, hand eczema with predominant involvement of other body parts. Patients with dermatophytosis, psoriasis and scabies of hands were excluded clinically and with investigations like KOH examination and skin histopathology, as required.

A detailed demographic profile, occupation, history regarding onset of disease, duration, progress of hand dermatitis, aggravating and relieving factors, seasonal variations, presence of atopy in self or family, day to day work, hobbies, and past and present treatment was recorded. A note was also made of symptoms and signs like itching, erythema, discharge, infiltration and pain. Severity of hand eczema was assessed objectively, in each case, using hand eczema severity index (HECSI).[6]

All the patients were patch tested with standard Indian patch test battery as approved by Contact Dermatitis And Occupational Dermatoses Forum of India, and supplied by Systopic India Limited Delhi. Patch test battery comprised of 20 antigens supplied readymade. List of antigens included in study is given at Table 1.

Patches were applied to upper part of back of the patient. Patch tests reading were taken after 48 hrs, 72 hrs and one week of patch testing and interpreted according to the International Contact Dermatitis Research Group criteria.[7]

Table 1: Antigens: list of Indian standard battery.

Compounds	Concentrations (%) (100%)	Vehicle
Potassium dichromate	0.1	Petrol
Control (petrolatum)	100	Petrol atum
Neomycin sulphate	20	Pet
Cobalt chloride	5	Pet
Benzocaine	5	Pet
PPD (p-phenylenediamine)	1	Pet
Parabens mix	9	Pet
Nickel sulphate	5	Pet
Colophony	10	Pet
Epoxy resin	1	Pet
Fragrance mix	8	Pet
Mercaptoben-zothiazole	1	Pet
Nitrofurazone	1	Pet
Chlorocresol	1	Pet
Wool alcohol	30	Pet
Parthenium	15	Pet
Formaldehyde	2	Pet
Black rubber mix	0.6	Pet
Thiuram mix	1	Pet
Myroxylonpereirae or balsum of peru	10	Pet

Pet: Petrol.

RESULTS

A total of 100 patients with age group 15 years to greater than 60 years of hand eczema were enrolled in this study. Majority of patients (52%) were in age group of 31-45 years. 30%, 13% and 5% patients of hand eczema were belonged in age group of 46- 60 years, 15-30 years and >60 years respectively. Out of total 100 patients of hand eczema, males and females were 59% and 41% respectively.

On occupation wise distribution, masons (29%) and house wives (24%) were greatly suffered with hand eczema. Others were farmers 16%, student 11%, office worker 9%, labourer 6% and others 5%. Majorities of female cases were students 7 (63.64%) suffered with hand eczema (Table 2).

In this present study, hyperkeratotic eczema (34%) was commonly seen in among 100 patients of hand eczema. Wear and tear dermatitis was merely seen in house wife 26 (26%). Pompopholyx, fingertip eczema, patchy vesiculosquamous eczema, unspecified eczema, recurrent focal palmar peeling and ring eczema was seen 12.5%, 10%, 8%, 7%, 3% and 1% cases respectively (Table 3).

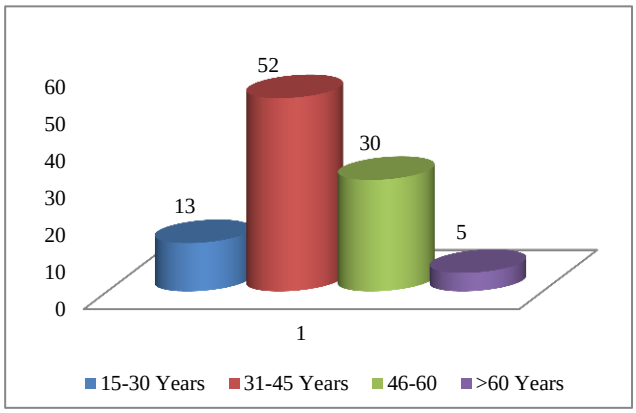

Figure 1: Age wise distributions of hand eczema patients.

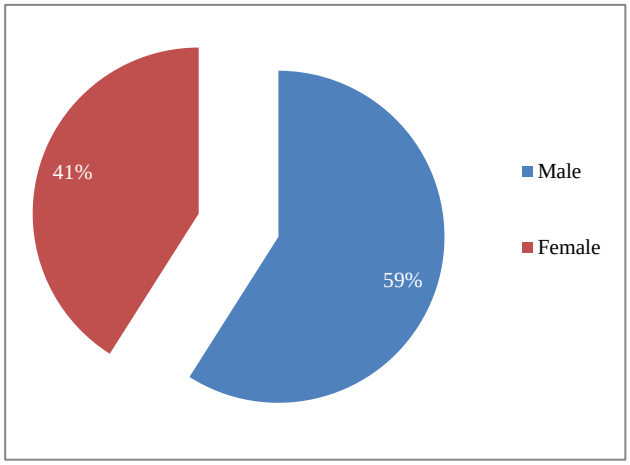

Figure 2: Gender wise distribution of hand eczema patients.

Table 2: Occupations wise distribution of hand eczema patients.

Occupations	Male		Female		Total	
	No	%	No.	%	No.	%
House wife	0	0	24	100	24	24
Mason	29	100	0	0	29	29
Farmer	16	100	0	0	16	16
Student	4	36.36	7	63.64	11	11
Labourer	4	66.67	2	33.33	6	6
Office workers	5	55.56	4	44.44	9	9
Others	4	80	1	20	5	5
Total	59	59	41	41	100	100

Table 3: Morphology of hand eczema.

Type of eczema	Male		Female		Total (n=100)	
	No.	%	No.	%	No.	%
Fingertip eczema	3	30	7	70	10	10
Wear and tear dermatitis (house wife)	0	0	26	100	26	26
Hyperkeratotic eczema	28	82.35	6	17.65	34	34
Patchy vesiculosquamous eczema	7	87.5	1	12.5	8	8
Pompopholyx	6	54.55	5	45.45	11	12.5
Recurrent focal palmar peeling	1	33.33	2	66.67	3	3
Ring eczema	1	100	0	0	1	1
Unspecified eczema	5	71.43	2	28.57	7	7

Table 4: Pattern of contact sensitivity (patch test positivity) (n=100).

Type of antigen positivity	No.	Percentage (%)
Nickel (Ni)	26	26
Fragrance (Frg)	13	13
Potassium dichromate (PD)	37	37
Paraphenylene-diamine (PPD)	9	9
Balsum of Peru (BP)	4	4
Cobalt chloride (CCD)	5	5
Wool alcohol (WA)	4	4
Parthenium (Par)	2	2

In this present study, according to pattern of contact sensitivity in total 100 patients, potassium dichromate (PD) 37 (37%) was the most common antigen/allergens positive for patch test in patients of hand eczema followed by Ni (26%), Frg (13%), PPD (9%), WA (4%) BP (4%), CCD (5%) and Par (2%) (Table 4).

Table 5: HECSI scores.

HECSI scores	Male (n=59)		Female (n=41)		Total (n=100)	
	N	%	N	%	N	%
<40	11	34.37	21	65.62	32	32
40-60	31	70.45	13	29.55	44	44
>60	21	87.5	3	12.5	24	24

HECSI scores in total 100 patients of hand eczema, <40 was in 32% cases, 40-60 in 44% cases and >60 was seen in 24% cases of hand eczema (Table 5).

Patients of hand eczema (32) with <40 HESCI scores had 18 (56.25%) cases with positive patch test for allergens.

44 cases of 40-60 HESCI scores had 26 (59.09%) cases with positive patch test for allergens. And 24 cases of >60 HESCI scores had 13 (54.17%) cases with positive patch test for allergens. And there was no significant association seen in between HESCI scores and contact sensitivity (Table 6).

Table 6: Association between contact sensitivity and severity of hand eczema (HECSI).

HESCI score	No. of patients	Patch test				P value
		Positive		Negative		
		No	%	No	%	
<40	32	18	56.25	14	43.75	0.317
40-60	44	26	59.09	18	40.91	0.317
>60	24	13	54.17	11	45.83	0.317

DISCUSSION

The eczematous group of skin disorders embraces a number of entities in which endogenous, exogenous, environmental and cultural factors are often interwoven. This is particularly true of eczema affecting the hands, a condition that is frequently multifactorial, usually disabling or distressing to the sufferer, and often difficult to treat. This difficulty is partly due to the intrinsic nature of eczema itself and the special anatomical features of the palmar skin but also because of the role of the hands in everyday social life and work and the inability of the patient to completely follow the avoidance techniques.[8]

In this present study, majorities of cases (52%) of hand eczema were seen in age group of 31 years to 45 years of age. Males (59%) were more sufferers with hand eczema than females (41%).

Recent years have seen an increase in the incidence of hand eczema in men, and a similar trend was seen in our study also. In both men and women, hand eczema has been rarely observed earlier than 20 years and later than 61 years of age.[9-11] Saha et al and Freeman had reported slightly higher prevalence for males than females.[12,13] Vani et al also reported a male to female ratio of 1.77:1 in cases of hand and foot dermatitis.[14]

Old individuals have various defects in induction and/or elicitation of allergic contact dermatitis which have explain this observation.[15]

Suman et al, Elston et al, stated that risk of hand eczema is found to be higher in industrial workers, masons and housewives because of exposure to various chemicals.[10,16]

Similar findings were obtained in our study, masons (29%) and house wives (24%) were commonly suffered with hand eczema than others occupations like farmers 16%, students 11%, office workers 9%, labourer 6% and others 5%. The reason for the delayed presentation in developed countries may be the differences in the socioeconomic and cultural background, presence of industrial protection acts and better safety equipments.

In this present study, hyperkeratotic eczema (34%) was commonly seen. This is near similar to similar findings of hyperkeratotic eczema, reported by Raghu et al, and Handa et al.[17,18]

Wear and tear dermatitis was merely seen in house wife 26 (26%) and pompopholyx, fingertip eczema, patchy vesiculosquamous eczema, unspecified eczema, recurrent focal palmar peeling and ring eczema was seen 12.5%, 10%, 8%, 7%, 3% and 1% cases respectively in our study. This was the similar the finding of Raghu et al, and Kishore et al.[17,19]

The most common allergens noted by Waranya et al were potassium bichromate (27%), nickel sulfate (26%) followed by fragrance mix and paraben mix.[20] In our study, according to patch test positivity, most common allergens were potassium dichromate (37%) followed by Ni (26%), Frg (13%), PPD (9%), WA (4%), BP (4%), CCD (5%) and Par (2%). This was similar to an observation made earlier by Latinga et al.[21] This indicates that many cases of eczema are initially irritant in nature but may later get complicated by sensitization.

Potassium dichromate as a common sensitizer in hand dermatitis has been reported by various workers.[10,22] This is especially true in developing countries, where legislation regarding the addition of ferrous sulphate to cement may simply not exist.

In this present study, majorities of hand eczema 44 (44%) had HECSI scores 40-60. And least number of cases (24%) had >60. And association between HECSI scores and severity of hand eczema was more positive patch test for allergens in patients 26 (59.09%) among total patients of HECSI scores 40-60 than patients of HECSI scores <40 and >60. And there was no significant (p=0.317) association seen in between HESCI scores and contact sensitivity. Agner, et al were found an association between contact sensitization and increased eczema severity in patients of hand eczema.[23] While in our study, we were not found a positive statistical correlation between increased eczema severity and positive patch test reactions (p=0.317).

CONCLUSION

This present study concluded that the hand eczema was commonly seen in male and middle age group (31-45 years) patients. Masons, house wives and farmers were mostly infected with hand eczema. Hyperkeratotic eczema and wear and tear dermatitis were the most common type of hand eczema. PD and Ni were the most common antigen/allergens for hand eczema. HECSI score 40-60 was seen in majorities of hand eczema cases. And there was no statistical significant association seen in between severity and positive patch test sensitivity in patients with hand eczema.

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Ethical approval: The study was approved by the institutional ethics committee

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