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Research article

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Association between occupational exposure and hand dermatitis: a cross-sectional study in outdoor patients attending tertiary care hospital in rural background

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ABSTRACT

Introduction

Hand eczema is common and chronic dermatological condition. It manifest in various morphological patterns related to occupational exposure of various chemicals.

Aim

To study the prevalence and morphological patterns of hand eczema and association with occupational exposure.

Material and methods

Sixty patients in age group of 15-60 years having hand eczema, attending outdoor department of dermatology were enrolled for the study.

Result

Prevalence of hand eczema was found to be 0.8% of total skin OPD. Commonest aggravating factors being soap and detergents in housewives (66%) followed by cement in labourers (53%) crop harvesting in farmers (45%).

Conclusion

Majority of patients had moderate effect on quality of life (DLQI Score 6-10) due to hand eczema.

Keywords: Hand eczema; Occupational exposure; Quality of life; House Wife.

INTRODUCTION

The hand is the most frequently symbolized part of the human body. Hand eczema is common and chronic dermatological condition. It can have massive socioeconomic consequence and greatly influence the quality of life. Morphological patterns of hand eczema described are pompholyx, recurrent focal peeling, ring eczema and chronic dermatitis.

The risk of hand eczema is very much related to occupational exposure and factors such as detergents, wet work, prolonged occlusion by gloves, cement, hairdressing products, cutting fluids and industrial involvement aggravate the eczema. Also atopic hand dermatitis is often aggravated by relevant exposure to irritants because the atopic skin has reduced threshold for irritant exposure.[1] For assessment of impact of hand

eczema on quality of life, both generic and disease specific questionnaire can be used.

Our study will assess hand eczema severity, morphological patterns and its association with occupational exposure.

AIMS AND OBJECTIVES

To study the prevalence and morphological patterns of hand eczema in rural set up.

To assess the impact of hand eczema on quality of life and its association with occupational exposure.

MATERIAL AND METHODS

A cross-sectional study was done in dermatology out-patient department at BPS Govt. Medical College for Women, KhanpurKalan, Sonapat within a period of 2 months. The project was approved by institutional ethical committee and ICMR.

Inclusion Criteria

All patients with age more than 15 years who presented with hand lesions suggestive of hand eczema were enrolled for the study after written informed consent.

Exclusion Criteria

- 1) Patients less than 15 year.
- 2) Patients with skin scraping positive for KOH.
- 3) Patient with any known history of dermatological disorder.

Demographic profile, symptoms, details of occupation, occupation related exposure, duration and aggravating factors were recorded. Examination, site of involvement and morphological patterns were assessed. Scoring system-severity of hand eczema was assessed using Hand Eczema Severity Index (HESI), the final score varies from 0 to 360 and dermatology life quality index (DLQI).

Hand eczema severity index (HESI): It includes scoring of morphological symptoms including erythema, induration, vesicles, fissuring, scaling, and edema as well as a scoring of the affected area on the hands. Each hand is divided into five areas: Fingertips, fingers (except the tips), palms, back of hands and wrists. For each of these areas the intensity of erythema, induration, vesicles, fissuring, scaling, and edema is graded on the following scale: 0-no skin changes; 1-mild disease; 2-moderate; and 3-severe. For each location (total of both hands) the affected area is given a score from 0-4 (0:0%; 1:1-25%; 2:26-50%; 3:51-75%; and 4: 76-100%) for the extent of clinical symptoms. Finally, the score given for the extent at each location is multiplied by the total sum of the intensity of each clinical feature, and the total sum called the HESI score is calculated, varying from 0 to a maximum severity score of 360 points. DLQI- It is a 10-item questionnaire, which covers six aspects of daily life experienced during the past week: (i) symptoms and feelings, (ii) daily activities, (iii) leisure items, (iv) work and school, (v) personal relationship items, and (vi) treatment. The DLQI score is calculated by summing the score of each question, with a maximum score of 30 and a minimum score of 0.,the higher the score, the greater the impairment of life.[2]

OBSERVATIONS AND RESULTS

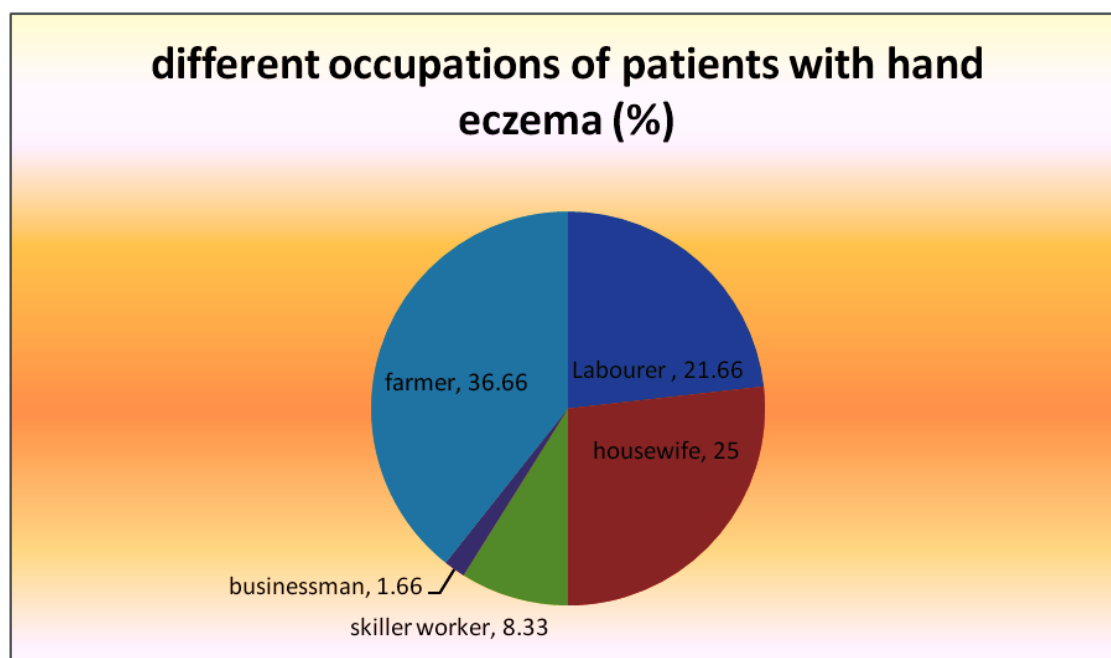
The data was evaluated using statistical tests like frequency, chi-square, ANOVA, t-test etc. and described in tables with frequencies. Maximum patients were farmers by occupation (36.6%) followed by house wives (25%), labourers (21.66%), skilled workers (8.33%), students (6.66%) and businessmen (1.66%).The data that we obtained from our study is described in the form of tables which are explained below. (**Figure-1**) Maximum patients had scaling followed by induration, erythema, fissuring, vesicles and edema. (**Table-1**)

Table-1 showing different morphological patterns of hand eczema on the basis of different sites and types of lesion.

Type of Lesion	Erythema (N%)	Induration (N%)	Vesicles (N%)	Fissuring (N%)	Scales (N%)	Edema (N%)
Finger Tip	43.75	43.75	50	37.5	56.25	18.75
Finger(Except Tip)	52.83	96.22	45.28	96.22	94.33	45.28
Palm	40	77.5	40	47.5	75	27.5
Back of Hand	47.05	76.47	47.05	29.41	88.23	23.53
Wrist	66.66	66.66	22.22	11.11	88.88	0

Table-2. There was significant affect of gender and occupation on DLQI. DLQI and HESI in terms of Gender, Age, Education status and Occupation

S. No.	Variables	p-value	
		HESI	DLQI
1	Age	0.907	0.223
2	Gender	0.458	0.011
3	Education	0.179	0.562
4	Occupation	0.412	0.011



Legend of figure 1: - Showing different occupations of patients with hand eczema



Legend of figure 2: - Various types of morphological pattern of hand eczema Seen in our study

RESULT

The prevalence of hand eczema in a tertiary care centre in rural area was found to be 0.8%. Out of 60 patients 56.7% (N-34) were males and 43.3% (N-26) were females. The commonest age group affected was between 41-60 years of age. Maximum patients were farmers (36.67%) followed by house wives (25%) and labourers (21.67%). The commonest aggravating factors being crop harvesting season in farmers (45%), soap and detergents in house wives (66%) and cement in labourers (53%). Morphological pattern- the commonest site affected was finger (except tip) - 88.33% followed by palm (66.67%), back of hand (28.33%), finger tip (26.67%) and wrist (15%). The mean S.D for HESI was 13.41 ± 11.05 and for DLQI was 7.55 ± 25 . There is correlation between HESI and DLQI ($r=0.404$) and correlation is significant $p=0.001$. (Table-2)

DISCUSSION

Hand eczema is a common occupational dermatological conditions for which patient seek care because of its effect on patient's day to day life. Patients of hand dermatitis seeking medical care in outpatient department were selected; total 60 patients were enrolled in the study. Although it was difficult to find out the prevalence in a hospital

based cross-sectional study but it was found to be 0.8% in patients attending outpatient department in a tertiary care centre in Haryana. Males (56.7%) were affected more than females (43.3%) similar to the studies done in past by Nanda B Kishore in which 56% were males and 44% were females.[3] Higher prevalence of hand dermatitis in males may be due to their occupations such as farmer, construction worker or labourer, where they are exposed to mechanical trauma or allergens which contribute to hand eczema. There is age related difference in the incidence of hand eczema; older patients have drier and thinner skin that does not tolerate soaps and solvents. According to literature, one third of the patients have hand eczema before the age of 20 years, which is in contrast to our study, where most of the patients were from 41-60 years of age group(51.6%).[4]

The risk of hand eczema is significantly related to the occupation as well. The high risk occupation include hairdressing (common irritants as wet work, shampoos, oxidizing bleaching agents), health care workers (exposed to irritants like wet work, disinfection, alcohol, cleaners and detergents) and construction and industry workers involving wet work, fiberglass and cement as irritants. In our study, maximum patients were

farmers (36.67%) followed by housewives (25%). Hand eczema was aggravated by crop harvesting in farmers and by soaps and detergents in house wives. The higher incidence of hand eczema and its aggravating factor in our study can be explained by the fact that in rural area most of the population is employed in agriculture and to increase the productivity and crop yield, pesticides are commonly used in the crops, which adversely affect the health of farmers.[5, 6] Agriculture workers are exposed to pesticides while mixing the pesticides, spraying crops and during harvesting of previously treated crops.[6, 7] Several studies have been done throughout the world to determine the contact of hand dermatitis associated with pesticide use in agriculture workers. According to a study done in Himachal Pradesh in India by Verma G et al, most common sensitizers among fruit and vegetable farmers were Captan (N-Trichlo methyl mercapto-4-cyclohexene-1,2-dicarboximide), and Propargite (2-(p-tert-butyl phenoxy) cyclohexyl 2-propynyl sulfite).[8] Among females, housewives were the most common occupational group affected by hand eczema. In our study housewives (25%) were the second most common group affected from hand eczema after farmers and common aggravating factor was found to be soaps and detergents. According to the studies done by Bajaj, and Singh and Singh, soaps and detergents were found to be the common sensitizers in females similar to our study.[9, 10] This high prevalence of hand eczema in housewives is attributed to the fact that they frequently wash their hands in water while working in kitchen and chronically exposed to soaps and detergents while washing clothes and cleansing. Soaps, detergents, vegetables, physical friction and minor trauma are the contact irritants

blamed for hand eczema. Physical irritants like friction, abrasive grains and detergents such as sodium lauryl sulphate produce more irritant contact dermatitis in combination than singly.[11] The stratum corneum, acts as first line of defence and have fundamental role in maintaining protection from the environment as well as in preventing water loss. These irritants cause damage by breaking or removing this upper protective layer of epidermis and render the skin susceptible to the previously well tolerated cutaneous exposures. The “acid mantle” of stratum corneum seems to be important for permeability barrier function.[12] Many soaps and detergents have alkaline pH which produces more irritation than acids. Also sodium lauryl sulfate which is found in a range of soaps and detergents is a classic experimental cutaneous irritant. In our study morphological pattern of hand eczema was also observed, no definite picture of hand eczema was observed in the patients under study but finger (except tip) was involved in maximum patients(88.33%) followed by palm(66.67%).

CONCLUSION

Majority of patients were farmers followed by house wives and there was significant impact of gender and occupation on DLQI ($p=0.011$, for both gender and occupation). Majority of the patients had lesions on fingers (except tip) followed by palms and majority had scales followed by induration due to hand eczema. Majority of the patients (48.3%) had moderate effect on quality of life (DLQI Score:6-10) due to hand eczema. There was significant correlation found between DLQI and HESI ($p=0.01$).

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