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Research Article

A Hospital-Based Cross-Sectional Study on Hand Eczema in a Tertiary Care Centre of Western Nepal

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ABSTRACT

Background & Objectives: Hand eczema is a prevalent dermatological condition that often presents with inflammatory, pruritic, and occasionally painful lesions, significantly affecting patients' quality of life and daily functioning. The study aimed to find out the demographical profile (age, sex, ethnicity) and the affected site, size and morphological features of the hand eczema in tertiary care hospital, western part of Nepal.

Material and Methods: This was a hospital based descriptive cross-sectional study carried out after ethical approval from Internal Review Committee, DMCRI. The period of study was from 15 May, 2023 to last of April, 2024. Total 218 cases were included in the study. The data were analyzed using SPSS version 16. Chi-square test was performed to find out the relation of morphological features at 95% confidence interval.

Results: The prevalence of hand eczema, who presented in DMCRI was 5%. Out of total 218 cases, the most commonly affected age group was 20 to 49 years, female to male ratio was 131:87(1.5:1). Chronic hand eczema cases were 185(85%), bilateral 191(87.5%). In our cases, dry palmar eczema was the most common morphology 68 (31.2%), followed by patchy vesicosquamous eczema 57 (26.1%).

Conclusion: In our study the hand eczema prevalence was 5.3%. The females of middle age group were most commonly affected. The chronicity, bilateral involvement were the most commonly observed parameters. We observed the dry palmar eczema was the most commonly observed morphological feature followed by the vesicosquamous eczema.

Keywords: Hand eczema, Prevalence, Morphological features

INTRODUCTION

Dermatological diseases rank among the most common diseases in underdeveloped

countries and are often considered minor and non-life-threatening, leading to their neglect in public health planning [1]. Hand eczema, the most common form of occupational skin disease, is an inflammatory itchy and occasionally painful skin disease, associated with impairment of everyday life, physical functioning, and health-related quality of life [2].

The reported prevalence of hand eczema in the general population is 2-15% [3]. The disease is defined as chronic, if it persists for more than 3 months or recurs two or more times within 12 months [3].

Hand eczema is most common in people, who work in high-risk jobs with a high cumulative exposure to contact irritants and allergens,(4) and belongs to the most frequently reported occupational diseases [4-6].

Individuals who are frequently exposed to irritants or allergens in both domestic and occupational settings—including professions such as hairdressers, beauty therapists, cleaners, metal workers, and healthcare professionals—have been reported to experience a prevalence of hand eczema ranging from 30% to 50%, suggesting that repeated contact with these agents plays a major role in the initiation and exacerbation of the disease. These irritants and allergens are not confined solely to occupational environments; substances encountered in everyday domestic life, such as soaps, detergents, cleaning agents, and even certain vegetables or plant-based products, can similarly provoke or worsen the condition, particularly in individuals who possess a genetically compromised skin barrier such as filaggrin gene mutations [7] or who engage in frequent handwashing and other behaviors that disrupt the epidermal integrity. The cumulative effects of these exposures can lead to chronic inflammation, lichenification, pain, pruritus, and an increased risk of secondary infections, thereby significantly impairing quality of life and emphasizing the importance of early recognition, preventive strategies, and comprehensive management approaches that address both environmental and behavioral risk factors [8].

Women are affected more about twice as often, likely due to greater exposure in both domestic and occupational settings [9]. In up to one-third of affected individuals the disease is moderate to severe and results in a particularly high personal and socioeconomic burden [10,11]. These irritants or allergens may be the vegetables, soaps, detergents. Impairment in form or function can result in severe emotional and psychological distress associated with a poor quality of life [12].

Eczema in association with occupational exposure are mostly related to carpet weaving, silk industry, beedi manufacturing and coffee plantation, more common in Asia in comparison to other parts of the worlds [13]. Skin protection measures and topical treatment are the mainstay of treatment as systemic therapy cannot be continued indefinitely [14].

The national literatures about the hand eczema prevalence and morphological features are scarce. This cross-sectional study is aimed to find out the demographical profile (age, sex, ethnicity) and the affected site, size and morphological features of the hand eczema in tertiary care hospital, western part of Nepal.

MATERIALS AND METHODS

This cross-sectional, observational, hospital-based study was conducted following

approval from the Institutional Review Board (IRB) of Devdaha Medical College and Research Institute (Ref. 1346/080/081; 10 May 2023), and was carried out over a period extending from 15 May 2023 to 30 April 2024, during which all patients presenting to the department who met the predetermined inclusion and exclusion criteria were carefully evaluated for enrollment in order to achieve the required sample size; ultimately, a total of 218 cases were included in the study. Informed consent was obtained from each participant prior to their inclusion.

The sample size for this study was calculated using the standard formula $n = Z^2pq / d^2$, in which Z = 1.96 represents the standard normal deviate at a 95% confidence interval, p = 0.15 corresponds to the reported prevalence of hand eczema, q = 1 – p = 0.85, and d = 0.05 represents the allowable margin of error; applying this formula yielded an initial sample size of 196 participants, which was then adjusted to account for a 10% anticipated non-response rate, resulting in a final calculated sample size of 215 participants, ensuring adequate statistical power for the study.

All patients who presented to the Department of Dermatology, Devdaha Medical College and Research Institute during the study period and were diagnosed with hand eczema by a Consultant Dermatologist with more than 10 years of experience were considered eligible for inclusion. Only those patients who met all other predefined study requirements and provided informed consent to participate were enrolled, ensuring that the study population accurately represented cases of hand eczema as confirmed by an experienced clinician.

Exclusion Criteria: Patients aged **below 18 years**, pregnant women, cases with **trauma,** and those with **other skin diseases involving the hands**—including **infective** dermatitis, dermatophytosis, eczematous drug reactions, psoriasis, and cumulative insult dermatosis**—**were excluded from the study. Exclusion was determined based on a combination of clinical history, morphological features, and potassium hydroxide (KOH) testing**,** ensuring that only patients with a confirmed diagnosis of hand eczema were included in the study population.

A detailed clinical history was obtained from each patient, including information regarding the time of onset, duration of symptoms, seasonal variations, and specific sites of involvement**,** while a comprehensive physical examination was conducted with special attention to the distribution of lesions and their morphological characteristics**,** all of which were meticulously recorded for subsequent analysis.

Operational Definition [15,16]

Dry Palmar eczema (DPE): Dry palmar eczema typically presents with diffuse erythema **of** the palms, often accompanied by fine scaling and hyperkeratosis**.** The skin may appear rough, fissured, and occasionally lichenified due to chronic scratching or rubbing. Vesicles are usually absent or minimal in this type, distinguishing it from acute or vesicular forms of hand eczema. Cracks or fissures may develop along the palmar creases, causing pain, especially during manual activities. In chronic cases, there may be accentuation of skin lines**,** with a thickened, dry, and sometimes slightly shiny appearance. Patients often report pruritus, tightness, and discomfort**,** which may worsen

in cold weather or with repeated exposure to irritants and detergents.

***Hyperkeratotic Hand Eczema (HHE)*:** Characterized by hyperkeratotic plaques on a slightly erythematous background, primarily affecting the palms and volar aspects of the fingers. Lesions may be associated with deep, painful, or bleeding fissures (rhagades). Plaque margins are often well-defined, dorsal hands are usually spared, and lesions typically have a symmetrical distribution, sometimes involving the feet.

***Vesicular Hand Eczema (VHE)*:** Characterized by deep-seated, intensely pruritic vesicles, typically appearing in crops on the lateral aspects of the fingers and palmar surfaces, often with concurrent involvement of the soles and toes. Vesicles may be translucent or erythematous, sometimes with scaling, annular patterns, erosions, or crusts from scratching. Severe cases may show coalescence of vesicles into larger, painful bullae.

***Nummular Hand Eczema (NHE)*:** Coin-shaped erythematous plaques, usually on the dorsum of the hands and occasionally extending to the fingers, sometimes forming an apron pattern. Lesions may show scaling, vesicles, or oozing, and other body areas can also be involved.

***Fingertip Hand Eczema (FHE)*:** This presents as well-demarcated eczematous lesions on the fingertips, characterized by erythema and desquamation, typically extending from the distal crease to the ventral aspect of the fingers and often associated with fissures. In some cases, the lesions may spread from the fingertips to involve the entire fingers or even the palms.

***Focal Palmar Peeling (FPP) or Keratosis Exfoliativa (KE)*:** This condition presents with dry skin and air-filled blisters that can be easily peeled off, leaving reddish, tender areas**.** The loss of the corneal layer, which normally protects the underlying skin, renders the area more vulnerable to dryness and cracking**.** KE primarily affects the volar aspects of the hands and feet**.** It typically begins with annular erythema and a central air-filled blister, followed by superficial collarette formation and lamellar peeling**.** In more severe cases, multiple lesions may coalesce**,** leading to superficial peeling over the entire palmoplantar surface. Subjective symptoms are generally rare**,** although the skin can become sensitive after repeated episodes of peeling

Procedure:

All patients who presented to the Department of Dermatology at Devdaha Medical College and Research Institute and were subsequently diagnosed with hand eczema by a Consultant Dermatologist possessing more than 10 years of clinical experience were included in the study, thereby ensuring that the diagnosis was made with a high degree of accuracy and consistency while also accounting for the dermatologist's extensive expertise. A comprehensive and detailed history was meticulously obtained from each patient, with special emphasis on the exact time of onset of symptoms, the total duration of the condition, potential seasonal variations, aggravating or alleviating factors, and the specific anatomical sites involved, in order to capture both the temporal and spatial characteristics of the disease as well as to facilitate the identification of possible environmental or behavioral triggers that may contribute to its progression. Furthermore, a thorough and systematic

physical examination was performed, with careful attention to the precise locations affected, the morphology, distribution, and severity of the lesions, and any additional clinical signs such as scaling, lichenification, or secondary infection, thereby providing a comprehensive clinical characterization of hand eczema in the study population and establishing a detailed baseline for subsequent analysis and comparison.

Patients aged below 18 years, pregnant women, cases with trauma, and other skin diseases involving the hands—such as infective dermatitis, dermatophytosis, eczematous drug reactions, psoriasis, and cumulative insult dermatosis—were excluded. Exclusion was based on history, morphological features, and potassium hydroxide (KOH) test as needed.

All results were analyzed with the statistical program SPSS 2016 and Microsoft excel 2020. Categorical data were analyzed in percentages and frequencies, the dependent variables were analyzed in percentages and frequencies and their relation was analyzed in Chi square/ Fisher Extract test. A p value of <0.05 is considered statistically significant.

RESULTS

A total 218 cases, who presented in the OPD of the Department of Dermatology, DMCRI from 15 th May, 2023 to Last of April, 2024 were included in the study. During the study period total 4062 patients visited according our Hospital Record Section and Dermatology OPD record Register.

The most commonly affected age group was 20 to 49 years, female to male ratio was 131:87(1.5:1). Chronic hand eczema cases were 185(85%) and acute eczema 33(15%) cases, bilateral 191(87.5%) and unilateral 27(12.4%) cases, Table 1.

Our data showed that the morphological features of hand eczema were chronic dry palmar eczema 68 (31.2%), vesico-squamous eczema 57 (26.1%), fingertip eczema 46 (21.1%), hyperkeratotic palmar eczema 34 (15.6%), nummular 8 (3.6%) and focal palmar peeling 5 (2.2%), Table 2.

Table:1- Clinico-demographic profile of the patients with hand eczema (N=218)

		Number (percentage)
Age	<20yrs	26 (11.9)
	20-30	42 (19.2)
	30-40	40 (18.3)
	40-49	43 (19.7)
	50-60	29 (13.3)
	>60	38 (17.4)
Gender	Female	131 (60)
	Male	87 (40)
Ethnicity	Brahmin	90 (41.2)
	Janajati	46 (21.1)
	Chhetri	45 (20.6)
	Madhesi	25 (11.4)
	Dalit	12 (5.5)
	Others	6 (2.7)
Duration	<3months	33 (15.1)
	>3months	185 (84.9)
Involvement	Unilateral hand	27 (12.4)
	Bilateral hand	191 (87.6)

Table:2- Morphological features of the patients with hand eczema (N=218)

Morphology	N (%)
Dry palmar eczema	68 (31.2)
Patchy vesicosquamous eczema.	57 (26.1)
Fingertip eczema	46 (21.1)
Hyperkeratotic palmar eczema	34 (15.6)
Nummular	8 (3.6)
Focal palmar peeling	5 (2.2)

DISCUSSION

Our study on hand eczema demonstrated a prevalence of 218/4062 (5.3%) among patients attending the Dermatology Department of Devdaha Medical College and Research Institute. The disease was most frequently observed in individuals aged 20 to 49 years, with a female-to-male ratio of 1.5:1. A majority of cases presented in the chronic form, accounting for 185 patients (85%), while bilateral involvement was seen in 191 patients (87.6%). These findings are consistent with previous studies, which have reported similar results [17,18]. In line with our results, Kumar et al. also observed that 77.71% of patients with hand eczema had involvement of both hands [19].

The relatively higher prevalence of hand eczema observed in our study among individuals belonging to the most productive age group may be explained by their occupational exposure to various allergens and irritants, which are likely to play a significant role in both the onset and persistence of the condition. The more number of chronic cases observed may also be due to the delayed behavior of our patients to seek medical care as reported by similar study [20].

The diagnosis of hand eczema is primarily established through a detailed patient history, recognition of characteristic clinical features, and careful exclusion of alternative diagnoses. Clinically, the condition may present with palmar redness, edema, and infiltration, along with vesicles, erosions, scaling, hyperkeratotic areas, and painful cracks or fissures. During the acute phase, lesions often exhibit exudation and blistering, whereas in the more chronic stages, crusting, persistent infiltration, and scaling become the predominant findings. The most frequently reported symptoms include intense pruritus and pain, both of which significantly impair quality of life. Despite its clinical importance, there is still no universally accepted classification system for hand eczema, and different studies have attempted to categorize it based on etiological factors, morphological characteristics, or disease duration derived from patient history [21].

Although our study was limited to the morphological features of hand eczema, we were unable to provide further etiological and pathophysiological correlations. In our cases, dry palmar eczema was the most commonly observed morphological type, followed by patchy vesicosquamous eczema. Other forms, in decreasing order of frequency, included fingertip eczema, hyperkeratotic palmar eczema, focal palmar peeling, and discoid (nummular) eczema.

However, the clinical utility of morphological classification is limited, as morphology alone does not reliably indicate the underlying cause and may evolve over time. Often, a polymorphic clinical pattern may emerge. Nevertheless, identifying morphological features remains valuable for patient counseling and prognostication, allowing clinicians to estimate disease severity before initiating further investigations and management. The palmar pattern was observed to be the commonest in study from St. John's Hospital and the entire hand involvement to be commoner than the finger only pattern [22].

Although our study is not without limitations, as it was conducted in a single center and lacked confirmatory investigations such as patch testing, prick testing, and histopathological examination, it nevertheless

provides valuable morphological insights that can aid in counseling patients regarding the nature and clinical course of hand eczema.

CONCLUSION

The prevalence of hand eczema was found to be 5.3%, and it was observed most frequently in individuals belonging to the 20–49-year age group, with a clear predominance among females. The condition most often presented in its chronic form, typically showing bilateral involvement, and the dry palmar type of eczema emerged as the most common morphological feature noted during the study.

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