ORIGINAL ARTICLE

Clinicoepidemiological Features of Hand Eczema in Healthcare Workers during COVID 19 Pandemic

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ABSTRACT

Background: Regular wearing of gloves and excessive use of hand sanitizers during severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has resulted in increased prevalence of hand eczema. **Aims and Objectives:** The aim of the study was to study prevalence and clinicoepidemiological factors of hand eczema among healthcare workers during SARS-CoV-2 pandemic at a tertiary care hospital. **Materials and Methods:** A cross-sectional survey was conducted at Smt. Kashibai Navale Medical College and General Hospital, Pune from April 2021 to May 2021. The clinicoepidemiological details were collected from all the doctors and nursing staff of the hospital in a preset questionnaire. **Results:** Among 200 healthcare workers, age group of participants was 20–50 years with mean age of 29.80 (SD: ± 6.32). Out of 200 healthcare workers, 120 were doctors and 80 were nurses. Out of 200, 94 (47%) experienced hand eczema (males = 43 and 51 were females = 51). Out of 94 cases, 68 had new onset hand eczema and 26 had aggravation of hand eczema. Itching (n = 76) was predominant complaint followed by erythema (n = 66). Distribution of hand eczema was predominantly over dorsum of hands. Most common aggravating factor was stress (n = 11). Commonly used gloves were powdered gloves (n = 122). Most participants suffering from hand eczema used gloves for 4–8 h (n = 95). **Conclusion:** Although hand hygiene is very important in this pandemic, all healthcare workers should be aware about rational and proper use of gloves and hand sanitizers so as to prevent hand eczema. Awareness about the prevalence of hand eczema in healthcare workers during this pandemic should be raised and preventive measures should be intensified.

Key words: Gloves, hand-sanitizer, Coronavirus disease-19, healthcare workers, hand eczema

INTRODUCTION

During severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, healthcare workers were affected in various physical and psychological ways. Dermatological manifestations were seen as a consequence to various steps taken to restrain the transmission of SARS-CoV-2. Hand eczema is the most common occupational skin disorder. The incidence of hand eczema among the general population worldwide is approximately 5–8%.[1] Its prevalence is more among the healthcare workers, chefs, hairdressers, and other occupations involving heavy wet work.[2] Hand eczema is a recurrent inflammatory disorder characterized by erythema, burning, scaling, fissures, itching, dryness, and vesicles.[3] It results in various cosmetic defects, psychological distress,[4,5] and a serious economic burden.[6,7] Various environmental and genetic factors have a pivotal role in the causation and prognosis of hand eczema. Hand hygiene is the most crucial preventive methods against cross-transmission of Coronavirus disease-19 (COVID-19). This has exacerbated the prevalence and severity of hand eczema. During this SARS-CoV-2 pandemic, recent studies have reported an increase in the prevalence of hand eczema in healthcare workers. Thus,

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it is important to determine the prevalence and risk factors of hand eczema, which may help us to develop proper preventive measures against hand eczema as we combat COVID-19.[8] In this study, we aimed to find the prevalence and clinicoepidemiological factors of hand eczema among healthcare workers (HCWs) in Western Maharashtra due to paucity of reports from Indian sub-continent.

Aims and Objectives

The objectives of the study are as follows:

- To study prevalence of hand eczema among HCWs during COVID-19 pandemic at a tertiary care hospital
- To study clinicoepidemiological factors affecting hand eczema among HCWs during COVID-19 pandemic at a tertiary care hospital.

MATERIALS AND METHODS

A cross-sectional survey was conducted at Smt. Kashibai Navale Medical College and General Hospital, Pune, from April 2021 to May 2021. The clinicoepidemiological data were collected from all the doctors and nursing staff of the hospital in a preset Questionnaire. Institutional Ethics Committee approval was obtained before the study. The healthcare workers were randomly approached by the researchers to explain the study and informed consent form was signed. The study was in accordance with the Declaration of Helsinki (as revised in 2013).

Sample size was calculated based on a German study among the doctors and nurses in which the prevalence rate (P) of hand eczema was 14.9%.[9] The confidence level (Z) was 95% and the allowed error (d) was 5%. The estimated sample size was determined to be 200 using formula $Z^2[P(1-P)]/d^2$.

Random numbers for each healthcare worker was allotted using SPSS version 25 software after the random seed was set as 12345 and the uniform distribution on the interval (0, 10). Random numbers were arranged in ascending order and the first 200 healthcare workers were selected.

Inclusion Criteria

- All doctors and nursing staff working at Smt. Kashibai Navale Medical College and General Hospital and giving consent to participate in the study were included in the study.

The questionnaire was distributed to the randomly selected medical staff and collected on the same day. No incentives were provided to study participants. Detailed clinical history along with basic demographic and occupational details was obtained from all participants.

1. History of hand eczema previous to this COVID-19 pandemic and aggravation in this pandemic?
2. Type of gloves used?
3. Duration of gloves used per day?
4. Frequency of hand sanitizer used per day?
5. History of atopic diseases?
6. Complaint associated with hand eczema?
7. Any aggravating factor for hand eczema was part of the questionnaire?
8. All participants were asked for past history of atopic dermatitis and concomitant sensitization to food and aeroallergens in early childhood, progressing to asthma, and allergic rhinitis.

The present condition of all participants was also assessed for hand eczema. Examination findings of all the participants at the time of submitting the survey were documented. The data were collected and documented in Google sheets.

Statistics Analysis

All data were analyzed by IBM SPSS Statistics version 25.0 and Epi-info software by CDC. $P < 0.05$ was considered statistically significant.

RESULTS

Among 200 healthcare workers, age group of participants was 20–50 years with mean age of 29.80 (SD: ± 6.32). Out of 200 study participants, 86.5% were in age group 20–35 years and 13.5% were in age group 35–50 years [Table 1]. Out of 200 healthcare workers, 94 (47%) experienced hand eczema, out of which 43 were males and 51 were females ($P = 0.2582$). Out of 200 healthcare workers, there were 120 doctors and 80 nurses. Out of 94 hand eczema cases, 68 had new onset hand eczema ($P = 0.0034$) and 26 had aggravation of hand eczema ($P \leq 0.0001$) [Table 2].

Most common type of gloves associated with hand eczema was powdered gloves, followed by latex gloves, and then latex-free gloves. The most common duration of wearing gloves leading to hand eczema was 4–8 h ($n = 95$) ($P = 0.8541$), followed by < 4 h ($n = 55$) ($P = 0.1248$), 8–12 h ($n = 45$) ($P = 0.1007$), and more than 12 h ($n = 5$) ($P = 0.5563$). Out of 94 hand eczema cases, 32 had frequency of hand washing <10 h/day, while 62 had frequency of hand washing more than 10 h/day ($P \leq 0.0001$). In our study, a history of atopic diseases was present in 47 participants, out of which 28 had hand eczema ($P = 0.0488$) and 19 without hand eczema [Table 2].

The distribution of hand eczema in affected participants was predominantly present over the dorsum of hands ($n = 85$),

Table 1: Age group of participants in the study

Age group	Number of participants	Percentage
20–35	173	86.5
35–50	27	13.5
Total	*n*=200	100

Table 2: Analysis of factors associated with hand eczema in the healthcare workers

Factors	Hand Eczema		*P*-value
	Present (94)	Absent (106)	
Gender			
Male	43	57	0.2582
Female	51	49	
Previous history of hand eczema			
Present	26	12	0.0034
Absent	68	94	
Aggravation of hand eczema			
Present	26	0	<0.0001
Absent	68	106	
Frequency of hand washing			
<10 h/day	32	79	<0.0001
>10 h/day	62	27	
Duration of gloves used per day			
<4 h/day	21	34	0.1248
4–8 h/day	44	51	0.8541
8–12 h/day	26	19	0.1007
>12 h/day	3	2	0.5563
History of atopic disease	28	19	0.0488

followed by wrist ($n = 25$), palms ($n = 24$), periungual ($n = 13$), and between fingers ($n = 9$) [Table 3 and Figure 1]. Most common aggravating factor in affected participants was stress ($n = 11$), followed by topical medications ($n = 4$) [Table 4]. Among affected participants, itching ($n = 76$) was predominant complaint associated with hand eczema followed by erythema ($n = 66$). Other complaints associated with hand eczema are burning ($n = 24$), sweating ($n = 18$), and scaling ($n = 10$) [Table 5].

DISCUSSION

The World Health Organization has recommended frequent hand washing to prevent the SARS-CoV-2 transmission.[10] In this pandemic, hand hygiene habits among HCWs who work in high-risk situations have changed which led to increase in frequency of handwashing.[11] With these new hand hygiene habits amidst the SARS-CoV-2 pandemic, there is increased prevalence of hand eczema.[12,13]

In our study, the prevalence of hand eczema was 47%which is high when compared to that found in a recent study during the COVID-19 pandemic done by Ibler *et al*.,[13] they reported 21% of prevalence of hand eczema. Similar finding was reported in study done by Techasatian *et al*.[14] They reported 20.87% prevalence of hand eczema. In a study done by

Table 3: Distribution of hand eczema in the affected participants (n=94)

Sites involved	Total number of sites involved in affected participants with hand eczema (n=94)
Between fingers	9
Dorsum of hand	85
Palm	24
Wrist	25
Nail/Periungual	13

Table 4: Aggravating factors associated with hand eczema in affected participants (n=94)

Aggravating factors	Total number of affected participants (n=94)
Stress	11
Topical application of medication	4
Excessive hand washing	2

Table 5: Symptoms associated with hand eczema in affected participants (n=94)

Symptoms	Total number of affected participants (n=94)
Erythema	66
Scaling	10
Itching	76
Burning	24
Sweating	18

Figure 1: Multiple well defined scaly plaques over both palms suggestive of hand eczema

Huang *et al*.[15] at Guangzhou, the prevalence of hand eczema was 10.8% in nurses and 6.9% in doctors. In our study, we

reported much higher prevalence; this may be due to climate variation, humid environment, and increased hand hygiene awareness.

Amongst all type of gloves, healthcare workers using latex gloves and powdered gloves developed hand eczema while latex-free gloves did not have significant impact on the development of hand eczema. Local pressure on the skin due to close-fitting gloves may result in emergence or exacerbation of hand eczema. In a study done at Iran by Tabary *et al*.,[16] they reported powdered free gloves are recommended in the COVID-19 pandemic situation. Latex and glove powder has been reported to cause allergic reaction leading to hand eczema. The duration of gloves worn per day dose not show any association with hand eczema in our study. Similarly, no significant association was noted between patients with hand eczema and the duration of gloves worn per day in a study done by Huang *et al*.[15]

Due to the fear of COVID-19 infection, the frequency of handwashing was increased among HCWs. In present study, we observed an increased risk of hand eczema when participants washed their hands more than 10 times/day ($P \leq 0.0001$). Similar findings were documented in a study done by Techasatian *et al*.[14] ($P = 0.015$). Whereas, in a study done at China by Huang *et al*.,[15] they did not find any correlation between the prevalence of hand eczema and frequency of handwashing per day in participants. In a study done by Heede *et al*.,[17] they found that hand eczema was associated in patients with a history of atopic dermatitis, filaggrin gene null mutations, and contact sensitization. Whereas, in our study, we did not find any statistically significant correlation between hand eczema and history of any atopic disorder. This may be due to small sample size in our study.

In our study, we found that most common symptom associated with hand eczema was itching seen in 76 participants followed by erythema in 66 participants. In a study done by Celik and Ozkars,[18] they reported dryness of hands in 70%, followed by itching and erythema in 49.3% and 43.4%, respectively. These findings were contrary to our study. This may be due to different climatic conditions. We undertook our study in summer season so dryness was reported in less participants. In our study, hand eczema was predominantly present over dorsum of hand in 47.5% of participants. Similar findings were reported in study done by Celik and Ozkars[18] In their study, the most common site for hand eczema was dorsum of hands seen in 85 patients. Whereas, in a study done by Singh *et al*.,[19] they reported a peculiar pattern of hand eczema as erythema and fine scaling mostly seen in the web spaces of fingers and on the palms. This was characteristic of hand sanitizer induced eczema because a dollop of sanitizer is taken in the palms first which later on gets trapped in the webspaces.

In our study, aggravation of hand eczema was found in 26 participants ($P \leq 0.0001$). Most common aggravating factor reported in our study was stress. In a study done by Huang *et al*.,[15] they reported that hand eczema is frequent among healthcare workers who are exposed to hair dye, those with a history of food allergy, and those with habit of frequent handwashing. It also showed a strong association between risks of hand eczema during the COVID-19 pandemic with patients having previous history of hand eczema ($P \leq 0.0034$). Similar findings were reported in a study done by Techasatian *et al*.[14] ($P \leq 0.001$). It should be noted that population with a history of hand eczema are at risk of developing recurrent hand eczema. Hence, preventive measures should be taken such as washing hands with lukewarm water, rinsing and drying hands thoroughly after washing, and applying fragrance-free emollients on the hands after handwashing.

Recommendations for maintaining hand hygiene should be incorporated into medical education curriculum for Indian healthcare workers. Rational hand washing for 20 s with sanitizers containing ethanol is warranted. Sanitizers should be allowed to dry first, and then moisturizer which is hypoallergenic should be applied to prevent the trapping of sanitizers in web spaces. As damp hands increase the permeability of sanitizers, a habit of washing hands before or just after application of sanitizer should be avoided.[20]

Limitation

The recruitment of participants was monocentric and allergic contact sensitization was not assessed by patch testing. The present study was set in a warm climate in India. Climate issues, environmental temperature, water temperature for handwashing, and the humidity of the environment may affect the results for hand eczema. Future in-depth studies with larger sample size and different climate conditions are required to overcome these limitations.

CONCLUSION

The prevalence of hand eczema during the COVID-19 pandemic was 47% in the study population. This shows much higher prevalence rate than previously reported studies. Although hand hygiene plays a crucial role in this pandemic, all healthcare workers should be aware about rational and proper use of gloves and hand sanitizers to prevent hand eczema. Awareness about the prevalence of hand eczema in healthcare workers in India during the COVID-19 pandemic should be raised, and preventive measures should be intensified.

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