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CONTACT DERMATITIS BY PPE USAGE IN INDIAN HEALTHCARE PROFESSIONALS

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ABSTRACT

Background: The WHO declared the coronavirus disease a pandemic in 2019, affecting a large number of people globally and having a high death rate. Healthcare personnel in India were recommended to use personal protective equipment (PPE) and hand sanitizers, among other precautionary measures. However, the data that is currently available indicates that the prevalence of occupational skin problems rises when PPE and hand sanitizers are used more often.

Aim: The purpose of this study is to investigate the prevalence of PPE-related work-associated contact dermatitis in Indian healthcare workers who have a history of atopic dermatitis.

Methods: The current study assessed whether the usage of personal protective equipment (PPE) was linked to work-related contact dermatitis in 208 healthcare workers. The gathered data was statistically analyzed, and conclusions were developed using frequency and prevalence data distributions.

Results: Men had fewer occupational diseases, whereas women made up 62.5% (n=128) of healthcare professionals. The majority of participants (44.2%) were in the 30–33 age range. 33.3% (n=10) of the research participants had atopic dermatitis, whereas 14.4% (n=30) of the Institute's healthcare professionals had contact dermatitis brought on by PPE use.

Conclusion: According to the current study, healthcare workers who have a history of atopy and use personal protective equipment (PPE) are much more likely to develop contact dermatitis.

Keywords: healthcare sector, occupational contact dermatitis, atopy, and personal protective equipment (PPE).

INTRODUCTION

In March 2020, the World Health Organization (WHO) declared COVID-19 (coronavirus disease 2019) to be a pandemic. Globally, the COVID-19 virus spread quickly. The number of COVID-19 cases increased dramatically, reaching about 114 nations with high death rates and a sizable population.^{1,2}

Numerous COVID-19 preventative measures have been recommended by the Indian Ministry of Health, such as maintaining a clean and healthy lifestyle, avoiding social situations, using face masks, and washing hands with soap or hand sanitizer. Healthcare workers can avoid infections by using PPE (personal protective equipment), such as gloves, masks, gowns, goggles, and face shields. The demand for personal protection equipment (PPE) is significantly increased by the use of antiseptics, detergents, and disinfectants.^{3,4}

Most of these products have allergies and irritants that might lead to skin issues at work. Healthcare workers who handle COVID-19, wear personal protective equipment (PPE) for more than six hours, and wash their hands more than ten times a

day are more likely to have skin damage and desquamation, which affects around 60% of patients, according to a Chinese literature review. Frequent and recurrent use of hand hygiene products has been associated with hand eczema. The receptor ACE-2 (angiotensin-converting enzyme-2), which is prevalent in skin blood vessels, hair follicles, and the basal epidermis, can allow SARS CoV-2 to enter the body through a breach in the skin barrier.⁵

Occupational skin disorders are pathological illnesses of the skin produced or worsened by the accumulation of chemicals and elements found in the work environment. Occupational skin illnesses are classified as allergic contact dermatitis or irritant contact dermatitis. Both of these disorders are considered occupational contact dermatitis.⁶

PKAK therapy consists of managing acute lesions that are susceptible to bacterial colonization, transferring workers with acute and severe dermatitis, and making occupational adjustments. Workers with dermatitis might be urged to use protective lotions and practice proper skin care. Changes in moisturizer use, personal protective equipment (PPE) for irritation protection, cleanliness for infectious agent protection, education, and allergies can all help prevent PKAK.⁷

The purpose of the current study is to investigate the prevalence of PPE-related work-associated contact dermatitis in Indian healthcare workers who have a history of atopic dermatitis.

METHODS AND MATERIALS

The goal of the current descriptive clinical study was to ascertain the frequency of work-related contact dermatitis linked to the use of personal protective equipment (PPE) among Indian healthcare workers who had previously had atopy dermatitis. Before taking part in the study, each participant gave written and verbal informed consent.

208 medical workers, including doctors and nurses, who employed personal protective equipment (PPE) and exercised hand hygiene throughout the COVID-19 epidemic at the Institute were included in the study. Physicians and nurses of both genders who agreed to participate were included in the study.

Patients who refused to give consent to participate in the trial, as well as those with acute or chronic illnesses based on clinical examination and history, were not included in the study. A comprehensive interview was conducted after each subject's complete medical history was recorded.

Data was gathered using a modified, extended version of the NOSO-2002 questionnaire, and dermatological evaluations were carried out at the Institute using teledermatology, health education facilities, and counseling, which included PPE and hand hygiene exercises. SPSS (Statistical Package for the Social Sciences) for descriptive measures, Student t-test, ANOVA (analysis of variance), and Chi-square test were used to statistically evaluate the gathered data. In addition to frequency and percentage, the statistics were displayed as mean and standard deviation. [p-value < 0.05 was considered statistically significant].

RESULTS

Finding the frequency of work-related contact dermatitis associated with the use of personal protective equipment (PPE) among Indian healthcare workers who had previously experienced atopy dermatitis was the aim of the current descriptive clinical investigation. The current study included 208 healthcare workers who had work-related contact dermatitis associated with wearing personal protective equipment (PPE).

In terms of demographics, the current study included 37.5% (n=78) males and 62.5% (n=130) females. In the age-based evaluation, 44.2% (n=92) of the participants were in the 31–33 age range, followed by 26% (n=54) in the 34–36 age group, 19.2% (n=40) in the 28–30 age group, and 10.6% (n=22) in the 38–40 age group (Table 1).

According to the study's findings, 65.4% (n=136) of individuals did not have a history of atopy, whereas 34.6% (n=72) did. Contact dermatitis was detected in 14.4% (n=30) of research participants who were wearing personal protective equipment (PPE), but not in 85.6% (n=178). 33.3% (n=10) of the 30 individuals with positive contact dermatitis had a history of atopy, whereas 66.7% (n=20) did not (Table 1).

DISCUSSION

208 healthcare workers with work-related contact dermatitis linked to the use of personal protective equipment (PPE) were included in the current study. After the research subjects were finally included, a comprehensive interview was conducted after each subject's complete medical history was recorded.

Data was gathered using a modified, extended version of the NOSO-2002 questionnaire, and dermatological evaluations were carried out using teledermatology, health education facilities, and counseling that included hand hygiene exercises and the use of personal protective equipment.

The design of the current study was similar to that of earlier research conducted by Ruttina E et al. in 2018 and Chaudhary NK et al. in 2020. According to the study's findings, 37.5% (n=78) of the participants were male and 62.5% (n=130) were female. 44.2% (n=92) of respondents in the age-based evaluation were between the ages of 31 and 33, followed by 26% (n=54) in the 34–36 age group, 19.2% (n=40) in the 28–30 age group, and at least 10.6% (n=22) in the 38–40 age group. These findings were in line with those of Cohen DE et al. (2019) and Kratzel A. et al. (2020), whose demographic data was comparable to that of the authors of the current study.

According to the study's findings, 34.6% (n=72) of the patients had a positive atopy history, whereas 65.4% (n=136) had a negative one. Contact dermatitis was detected in 14.4% (n=30) of research participants who were wearing personal protective equipment (PPE), but not in 85.6% (n=178). 33.3% (n=10) of the 30 individuals with positive contact dermatitis had a history of atopy, while 66.7% (n=20) did not. These results were in line with previous research by Moore LD et al. (2021) and Lan J et al. (2020), where the authors discovered atopy-related consequences similar to the current study.

CONCLUSION

Within its limits, the current study shows that a high prevalence of work-related contact dermatitis with a history of atopy is caused by healthcare workers' usage of personal protective equipment (PPE). Future research on work-related atopic dermatitis in healthcare workers from multi-institutional setups is required for larger sample sizes and longer monitoring periods.

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Characteristics	Number (n)	Percentage (%)
Age range (years)		
28-30	40	19.2
31-33	92	44.2
34-36	54	26
38-40	22	10.6
Gender		
Males	78	37.5
Females	130	62.5
Atopy history		
Yes	72	34.6
No	136	65.4
Contact dermatitis related to PPE use		
Yes	30	14.4
Atopy history positive	10	33.3
Atopy history negative	20	66.7
No	178	85.6

Table 1: Demographic data of study participants