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ASSESSING THE FREQUENCY OF WORK-ASSOCIATED CONTACT DERMATITIS ISSUES RELATED TO PPE USAGE IN INDIAN HEALTHCARE PROFESSIONALS WITH AN ATOPIC DERMATITIS HISTORY

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ABSTRACT

Background: In 2019, WHO labeled coronavirus illness a pandemic, impacting a huge number of people worldwide with high fatality rates. The Indian healthcare industry advised a variety of preventative techniques for healthcare workers, including hand sanitizers and personal protective equipment (PPE). However, available information suggests that greater usage of PPE and hand sanitizers leads to an increase in the prevalence of occupational skin disorders.

Aim: The current study aims to examine the prevalence of work-associated contact dermatitis subjects connected to PPE usage in Indian healthcare professionals with an atopic dermatitis history.

Methods: The current study evaluated 208 healthcare professionals for the existence of work-related contact dermatitis associated with the use of personal protective equipment (PPE). The collected data was statistically examined, with frequency and prevalence data distributions used to formulate findings.

Results: The study found that 62.5% (n=128) of healthcare professionals were female, whereas men experienced less occupational illnesses. The bulk of participants (44.2%) were between the ages of 30 and 33. The incidence of contact dermatitis caused by PPE usage in the Institute's healthcare professionals was 14.4% (n=30), whereas atopic dermatitis was seen in 33.3% (n=10) of the research participants.

Conclusion: The current study suggests that there is a significant frequency of contact dermatitis in healthcare professionals due to the usage of PPE (personal protective equipment), with a history of atopy.

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

INTRODUCTION

The World Health Organization (WHO) classified COVID-19 (coronavirus disease 2019) a pandemic in March 2020. The COVID-19 virus spread rapidly on a worldwide scale. COVID-19 cases grew significantly, spreading to roughly 114 countries with high death rates and a large number of afflicted individuals.^{1,2}

The Indian Ministry of Health has advised many COVID-19 preventive techniques, including as healthy behavior, clean conduct, social distance, wearing face masks, and washing hands with hand sanitizers and/or soap. PPE (personal protective equipment) such as face shields, goggles, gowns, masks, and gloves are used to prevent infections among healthcare personnel. The use of antiseptics, detergents, and disinfectants dramatically increases the need for personal protective equipment (PPE).^{3,4}

The bulk of these items contain irritants and allergens, which might cause occupational skin problems. According to Chinese literature study, healthcare professionals handling COVID-19, as well as those who wear PPE for more than 6 hours and use hand hygiene more than 10 times per day, are at a higher risk of skin damage and desquamation, which occurs in approximately 60% of patients. Hand eczema has been linked to repeated and frequent usage of hand hygiene products. A break in the skin barrier can allow SARS CoV-2 to enter the body via the receptor ACE-2 (angiotensin-converting enzyme-2), which is abundant in skin blood vessels, hair follicles, and the basal epidermis.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. PKAK therapy involves managing acute lesions prone to bacterial colonization, transferring workers with severe dermatitis, and adjusting occupational duties.

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 current study aims to examine the prevalence of work-associated contact dermatitis subjects connected to PPE usage in Indian healthcare professionals with an atopic dermatitis history.

MATERIALS AND METHODS

The current descriptive clinical investigation sought to determine the prevalence of work-related contact dermatitis associated with PPE usage in Indian healthcare professionals with a history of atopy dermatitis. The research subjects were from the Institute's Department of Dermatology. All individuals provided verbal and written informed permission before participating in the study.

The study comprised 208 healthcare professionals, including physicians and nurses, who used PPE and practiced hand hygiene during the COVID-19 pandemic at the Institute during the study period. The research included doctors and nurses of all genders who were willing to participate. The study excluded patients with chronic or acute illness based on clinical examination and history, as well as those who refused to grant consent for study participation.

Following the final inclusion of the research subjects, a full history was documented for each subject, followed by a thorough interview. A modified lengthy version of the NOSO-2002 questionnaire was used to collect data, and dermatological assessments were performed at the Institute utilizing health education facilities, counseling, and teledermatology, which included hand hygiene activities and the use of PPE.

The collected data were statistically analyzed using SPSS (Statistical Package for the Social Sciences) software version 24.0 (IBM Corp., Armonk, NY, USA) for descriptive measures, Student t-test, ANOVA (analysis of variance), and Chi-square test. The data were presented in the form of mean and standard deviation, as well as frequency and percentage. A p-value < 0.05 was considered statistically significant.

RESULTS

The current descriptive clinical investigation sought to determine the prevalence of work-related contact dermatitis associated with PPE usage in Indian healthcare professionals with a history of atopy dermatitis. The current study included 208 healthcare professionals who had work-related contact dermatitis associated with the use of 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 31-33 years old, followed by 26% (n=54) in 34-36 years, 19.2% (n=40) in 28-30 years, and 10.6% (n=22) in 38-40 years (Table 1).

According to the research's findings, 34.6% (n=72) of study participants had a history of atopy, whereas 65.4% (n=136) had none. When contact dermatitis was assessed in study subjects using PPE (personal protective equipment), it was found in 14.4% (n=30) of them and not in 85.6% (n=178). Among 30 participants with positive contact dermatitis, 33.3% (n=10) had a history of atopy, while 66.7% (n=20) did not (Table 1).

DISCUSSION

The current study included 208 healthcare professionals who had work-related contact dermatitis associated with the use of personal protective equipment (PPE). Following the final inclusion of the research subjects, a full history was documented for each subject, followed by a thorough interview. A modified lengthy version of the NOSO-2002 questionnaire was used to

collect data, and dermatological assessments were performed utilizing health education facilities, counseling, and tele dermatology that included hand hygiene activities and the use of personal protective equipment. The design of the present study was similar to the design adopted by the previous studies of Ruttina E et al⁸ in 2018 and Chaudhary NK et al⁹ in 2020 where authors adopted the study design similar to the present study in their respective studies.

According to the study's findings, 37.5% (n=78) of the participants were male and 62.5% (n=130) were female. In the age-based evaluation, 44.2% (n=92) of the respondents were 31-33 years old, followed by 26% (n=54) in 34-36 years, 19.2% (n=40) in 28-30 years, and at least 10.6% (n=22) in 38-40 years. These findings were congruent with those of Cohen DE et al¹⁰ in 2019 and Kratzel A. et al¹¹ in 2020, whose demographic data was identical to that of the authors in the current study.

The study results also revealed that a history of atopy was positive in 34.6% (n=72) of the patients and negative in 65.4% (n=136). When contact dermatitis was assessed in research subjects connected to the use of PPE (personal protective equipment), it was found in 14.4% (n=30) of them and not in 85.6% (n=178). Among 30 participants with positive contact dermatitis, 33.3% (n=10) had a positive atopy history, whereas 66.7% (n=20) had a negative one. These findings were consistent with prior investigations by Moore LD et al¹² in 2021 and Lan J et al¹³ in 2020, in which the authors found atopy-related outcomes comparable to those in the current research.

CONCLUSIONS

The present study, within its limitations, concludes that there is a high prevalence of contact dermatitis in healthcare workers due to the use of PPE (personal protective equipment) with a high prevalence of work-related contact dermatitis with a history of atopy. Further studies are needed in the future concerning work-related atopic dermatitis in healthcare professionals from multi-institutional set-ups for longer monitoring periods and with larger sample sizes.

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

Table 1: Demographic data of study participants