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Original Research Article

CUTANEOUS ADVERSE REACTIONS SECONDARY TO PERSONAL PROTECTIVE EQUIPMENTS AMONG HEALTH CARE WORKERS: IN COVID PANDEMIC

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ABSTRACT

Introduction: Nearly all health care workers (HCWs) worldwide have seen a significant change in their practices as a result of COVID-19's global outbreak. On the other hand, prolonged and extensive use of personal protective equipment (PPE) may result in a variety of undesirable skin reactions. The causes may include increased usage frequency and duration, wearing apparel that is too tight or too loose, or having a material allergy to PPE.

Methodology: This cross-sectional observational study was carried out in April 2020. A particular questionnaire was prepared and made available online via a link generated by Google Forms. After 206 HCWs expressed interest in participating in the study, the study's final sample size consisted of 206 HCWs. The following questions were freely answered by participants: Work environment, demographic information, and any symptoms or signs of dermatology

Results: The HCW's mean age was 32 ± 5.2 years. In the study, 119 (57.8%) females and 87 (42.2%) males participated. Among these were 128 (62%) doctors, 41 (20%) nurses, 21 (10%) technicians, and 16 (8%) housekeepers. Regarding protective gear, the N95 mask was most frequently used (94.6%), and its most frequent side effect (54.1%) was redness at the nasal bridge.

Conclusion: . Healthcare workers who wear PPE for extended period of time have a higher risk of developing dermatosis. Therefore, it is necessary to control the hours that HCWs work. Preventive guidelines for occupational dermatitis secondary to PPE must be established and the afflicted HCWs must receive efficient dermatological care.

Key words: Cutaneous manifestations, PPE, COVID-19

INTRODUCTION

Nearly all health care workers (HCWs) worldwide have seen a significant change in their practices as a result of COVID-19's global outbreak. [1] HCW are required to wear personal protective equipment (PPE) due to the high prevalence of COVID-19 transmission and the uncertainty regarding patient's infection status. [2] During the pandemic, frontline HCWs have encountered many difficulties in treating and caring for COVID-19 patients. [3] World Health Organization (WHO) reported in April 2020 that PPE should be used to reduce the risk of infection. This includes goggles, N95 (NIOSH- National Institute for Occupational Saftey and Health) or FFP2 (Filtering Face Piece) masks, surgical masks, gloves, aprons, scrubs, alcohol-based antiseptics and soaps and face shields. . On the other hand, prolonged and extensive use of PPE may result in a variety of undesirable skin reactions. For example, people with an atopic predisposition may experience contact dermatitis brought on by

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allergens and irritants in alcohol-based hand cleanser. [4] The usage of PPE by healthcare professionals has increased, which has led to an increase in PPE-related side effects. The causes may include increased usage frequency and duration, wearing apparel that is too tight or too loose, or having a material allergy to PPE. [5] As the body's first line of defense, the integrity of the skin must be preserved to stop the spread of COVID-19. Dermatological issues should be treated seriously since using PPE like masks, glasses, and protective clothes may compromise the integrity of the skin. [6] Assessing the skin issues that HCWs experience as a result of wearing PPE was the aim of this study.

METHODOLOGY

This cross-sectional observational study was carried out in April 2020. A particular questionnaire was prepared and made available online via a link generated by Google Forms. HCWs working in the COVID-19 setup were provided with links through social media platforms such as WhatsApp. After 206 HCWs expressed interest in participating in the study, the study's final sample size consisted of 206 HCWs. The following questions were freely answered by participants: Work environment, demographic information, and any symptoms or signs of dermatology. After being entered into Google Sheets, the responses were imported into Microsoft Excel. The biostatics primer software was used to carry out the statistical analysis.

All doctors working in a COVID-19 dedicated setup in a hospital or other institution were included in the study, including nurses, technicians, and cleaning staff. All healthcare workers were asked to take part in the study, regardless of whether they experienced any skin manifestations. The study excluded HCWs who declined to participate.

RESULTS

The study involved 206 HCWs. The HCW's mean age was 32 ± 5.2 years. In the study, 119 (57.8%) females and 87 (42.2%) males participated. Among these were 128 (62%) doctors, 41 (20%) nurses, 21 (10%) technicians, and 16 (8%) housekeepers. The PPE that HCWs wore during the COVID-19 pandemic is depicted in Graph 1. Because of PPE use, dermatosis most frequently affected the face, then the hands. A total of 17.6% of HCWs had a history of pre-existing skin conditions, with acne being the most prevalent. The cheeks, retroauricular area and mandibular angle were the common locations for acneiform eruptions and acne. Of the subjects, 14.1% (n = 29) claimed that wearing PPE made their previously diagnosed skin conditions worse. Only 36 (17.3%) HCWs, however, sought medical advice from a dermatologist regarding skin issues. HCWs who had taken precautions against PPE-related adverse effects made up 26.4% of the all, of which 41% reported reduced adverse effects. According to the assessment of the PPE used, 30% of the participants (n = 62) used it for 1-4 hours, 62% (n = 128) for 4-8 hours, and 8% (n = 16) for more than 8 hours at a time. Regarding protective gear, the N95 mask was most frequently used (94.6%), and its most frequent side effect (54.1%) was redness at the nasal bridge (graph 2). The various reactions that the respondents reported included dryness of the skin, pressure bruises, redness of the skin, and itching, allergic contact dermatitis etc., (Image 1) (table1). A skin reaction on the forehead affected 23.6% of

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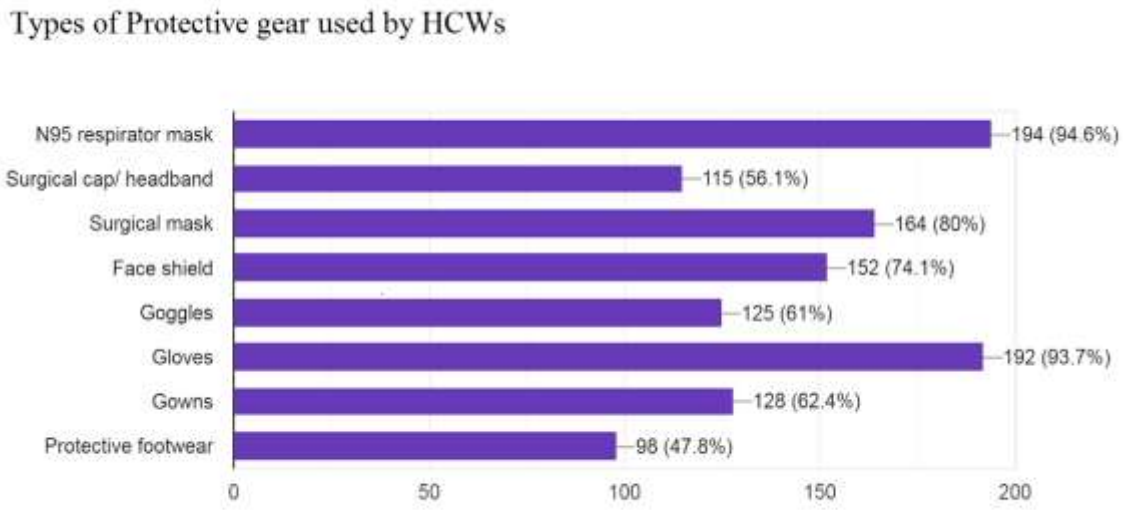
the respondents who were wearing face shields for eye protection. The most frequent side effect after wearing gloves was dry skin. The majority of HCWs (72.7%) categorized the reaction as mild (graph 3).

Graph 1: Various protective gear used by HCW



Graph 2: Various adverse skin reaction due to N95 mask

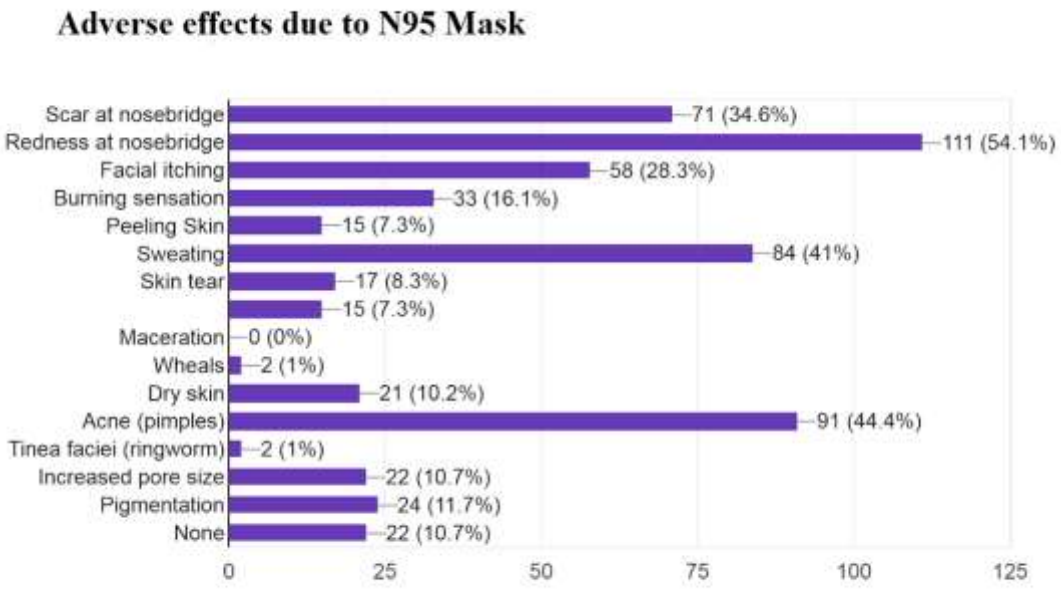


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Table 1: Various cutaneous manifestations due to PPE reported by HCWS n (%)

Cutaneous manifesations	n (%)
Excessive sweating	192 (93.2%)
Redness of skin	111 (53.8%)
Pressure bruise	69 (33.5%)
Ear soreness	58 (28.2%)
Allergic Contact Dermatitis	46 (22.3%)
Intertrigo	18 (8.7%)
Fungal infections	16 (7.8%)
Itching	16 (7.8%)
Acne	12 (5.8%)
Dryness	10 (4.9%)
Peeling of skin	8 (3.9%)
Chapping of skin around mouth	5 (2.4%)
Flaring of seborrheic dermatitis	2 (0.9%)
Miliaria	2 (0.9%)
Folliculitis	2 (0.9%)

Graph 3: Severity of cutaneous adverse reaction secondary to PPE

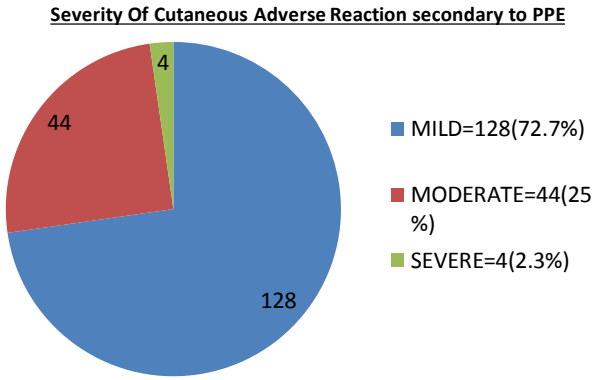

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Image 1: Cutaneous adverse reactions secondary to PPE among HCWs.

ACD- Allergic Contact Dermatitis

DISCUSSIONS

PPE is necessary to protect HCWs, but in the midst of the COVID-19 pandemic, occupational dermatitis brought on by PPE is becoming an increasing concern. Among the 206 HCWs in our study, 57.8% were female. There were 292 (77.7%) female HCWs in a cross-sectional study in Wuhan that looked into skin issues linked to PPE use. [7] The 206 HCWs that took part in our study had a mean age of 32 ± 5.2 years. However, Foo stated that the average age of the 340 participants in his study was 32.4 years. [8]

The N95 mask was most frequently used in our study (94.6%), and its most frequent side effect (54.1%) was redness at the nasal bridge. However, 49% of participants in the Zuo study experienced adverse skin reactions as a result of wearing masks. [9] Prolonged friction and pressure could be a possible cause. In our study, 41 percent of HCWs experienced sweating as a side effect and 44.4% developed acne after using a N95 mask. In their study, Deoghare S et al. found that the most common dermatoses secondary to mask use were acne (26.25%) and hyperhidrosis (18.83%). [5]

Acne is the most frequent adverse reaction to the N95 mask, and there are two reasonable reasons for this. First, the areas of the face covered by the mask create a humid and warm microclimate that makes acne flare-ups more likely. Second, a flare-up of acne could be caused by the close-fitting mask's localized pressure on the skin, obstructing the

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pilosebaceous ducts. Just 17.3% of the HCWs in this study sought advice from a dermatologist regarding skin issues. This was comparable to the findings of the Foo study, which showed that only 15 out of 109 employees saw a doctor about a skin condition.

Therefore, it's important to educate medical professionals about the potential for adverse skin reactions from PPE use as well as preventative measures. [8] Increased sweating was the most common symptom observed in our study, accounting for 93.2% of HCWs, followed by skin redness (53.8%) and pressure bruises (33.5%). This was comparable to a study by Deoghare S. et al. wherein common symptoms included increased sweating in 54.64% of doctors, followed by skin redness in 50.13% and itching in 35.54%. [5]

According to Lin [7] and Lan [10], wearing PPE for longer than six hours a day increased the risk of adverse skin reactions. This result was consistent with what we found. Furthermore, the degree of skin reactions was ascertained by means of self-administered questionnaires, wherein the majority of healthcare workers (72.7%) reported a mild reaction. This result was consistent with research by Foo et al. [8]

CONCLUSION

The PPE kit is essential for healthcare workers because it protects them from viruses. Healthcare workers who wear PPE for extended period of time have a higher risk of developing dermatosis. Therefore, it is necessary to control the hours that HCWs work. Preventive guidelines for occupational dermatitis secondary to PPE must be established and the afflicted HCWs must receive efficient dermatological care. As a result of our study's high incidence of adverse skin reactions due to PPE, early consideration of preventive measures can be considered during the still-alarming epidemic threat.

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