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## Original Research Article

## Cutaneous adverse effects following COVID 19 precaution taking measures

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## ABSTRACT

**Background:** The outbreak of a mysterious pneumonia, reported from a sea food wet market of Wuhan, Hubei, China in 2019 has now taken the shape of a pandemic with successive waves sweeping across nations and creating havoc. Moreover, the transmission speed is much more than earlier severe acute respiratory syndrome coronavirus (SARS) and Middle East respiratory syndrome coronavirus (MERS) making it imperative for the use of protective gears like masks, gloves and personal protective equipment (PPE) kits but ironically they in itself lead to a range of cutaneous complications making it difficult to continuously wear them.

**Aim:** The purpose of this study was to assess the various adverse dermatological manifestation among general population in view of the various precautions taken against COVID-19.

**Materials and Methods:** This was a descriptive questionnaire based study and a total of 105 patients were taken up for the study who came to the dermatology outpatient department (opd) with dermatological manifestations following covid 19 protection measures who met the inclusion criterias. All those who didn't give consent for the study were excluded from the study.

**Results:** A total of 105 questionnaires were collected. The males outnumbered the females with 71 males and 34 females. The most common reason implicated was wearing masks, goggles in 42(36.19%) patients followed by use of hand sanitizers and frequent hand washing seen in 36(12.4%) patients. In 20(19%) patients, use of gloves resulted in adverse dermatological manifestations followed by the use of PPE kits in 7(6.6%).

**Conclusion:** The prevalence of Covid -19 precaution taking measures is of utmost importance specially among the health care workers and office going people who have to adorn it for prolonged hours thus leading to adverse effects. Prompt diagnosis and this data can offer valuable insights to help modify the adverse effects.

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## 1. Introduction

In December 2019, an outbreak of a mysterious pneumonia was reported from a sea food wet market of Wuhan, Hubei, China. Later over the months, this was reported to involve multiple nations.<sup>1</sup> The WHO first declared it a Public Health Emergency of International Concern (PHEIC) on January 30, 2020 and later gauging its imminent threat, it was

declared a pandemic on 11 march 2020 by the WHO.<sup>2,3</sup> Later, a novel corona virus SARS-COV-2 was implicated and as of 12 november 2021, a 252 million confirmed cases with 5 million deaths have been reported worldwide.<sup>4</sup> The pandemic has disrupted health care systems across the world. The most common symptoms are fever, cough with dyspnea although a variety of manifestations have been reported till date including anosmia, ageusia, fatigue, myalgias. The virus has been seen to attack mainly the

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respiratory system, the coagulation system although a myriad of afflictions have been reported by this virus. Also various dermatological manifestations have been reported in various studies.<sup>5</sup> The dermatological manifestations can be attributed to either of the following three factors:- Skin lesions as a result of personal protective equipment (PPE) and COVID-19 prevention taking measures, Skin findings due to the pathophysiological changes by SARS-CoV-2 virus infections, Skin findings following COVID-19 treatment agents.<sup>6</sup> The masks, gloves, PPE kits, hand sanitizers containing alcohol were the main armaments for providing against protection and still are equally essential.<sup>7</sup> However, the use of the personal protective equipment (PPE) and other precaution taking measures results into an array of adverse skin reactions. This study was undertaken at a tertiary centre of north India assessing the various skin manifestations among the patients attending the dermatology opd following COVID-19 precaution taking measures.

## 2. Materials and Methods

This study was undertaken at a tertiary care centre of North India. The purpose of this study was to assess the various adverse dermatological manifestations among the patients in view of the various precautions taken against COVID-19. This was a descriptive questionnaire based study and a total of 105 patients were taken up for the study who met the inclusion criteria. The inclusion criteria included:- all those giving written informed consent, all patients presenting to opd with complaints of dermatological adverse reactions following covid-19 taking precautions. All those who didn't give consent for the study were excluded from the study. Due consent was taken from the ethical committee of the institute and a written informed consent was taken from all the participants. The questionnaire was distributed among all the participants and they were asked to return after filling the questionnaire form. It included the following data to be recorded- age, gender, duration of use of protective equipment like PPE, gloves, masks etc. morphology and type of the adverse skin reactions were noted. The questionnaire was collected. All the data was analysed using the SPSS21.0 software (SPSS Inc, Chicago, IL). The inferences were drawn.

## 3. Results

A total of 105 questionnaires were collected. The males outnumbered the females with 71 males and 34 females. Out of 105, 95(90.4%) patients were office going. 45 among these 95 office going patients were health care workers (hcw's) in our hospital involved in managing covid 19 patients. The age and gender distribution is given in table 1. The most common reason implicated was wearing masks, googles in 42(36.19%) patients followed by use of hand

sanitizers and frequent hand washing seen in 36(12.4%) patients. In 20(19%) patients, use of gloves resulted in adverse dermatological manifestations followed by the use of PPE kits in 7(6.6%). The most common site involved were the hands seen in 56(53.3%), cheeks in 21(20%), chin (10, 9.5%), back (7,6.6%), nasal bridge (6,5.7%), forehead(3,2.8%) and retroauricular area (2,1.9%).

1. Among 42 patients reporting adverse effects due to masks, 40 patients reported the adverse effects after the use of N95 masks. The most common side effects pressure sores, abrasions, seen in 17 patients, acneiform eruption, superficial folliculitis in 12, wheals in 6, burning sensation and itching in 4, erythema in 2 patients. The average duration of use of the mask leading to adverse dermatological effects ranged >10 hours. Maximum patients were in the age group of 30-39 years followed by 40-49 years and lastly in the 50-59 years. 19 patients kept on using N 95 masks whereas rest resorted to resorted to double surgical masks.
2. Among 36 patients using hand sanitizers and frequent hand washing, the most common symptoms were burning and itching sensation seen in 15 patients, dry chapped skin in 14 patients and precipitation of allergic contact dermatitis in 5 with a previous history of hand eczema and in 2 patients intertrigo was seen. In 28 patients the frequency of hand washing and hand sanitizers use was more than 10 times.
3. Among 20 patients having adverse dermatological manifestations from latex gloves, the most common manifestation was dry chapped skin in 12 followed by edema and vesiculation seen in 6 patients. In the rest there were symptoms of itching, contact urticaria. (Figure 1) The duration of use of latex gloves leading to these adverse effects ranged from 4-10 hours. In 5 patients, there was a previous history of hand eczema and use of latex gloves further precipitated a new episode. Most of the patients were in the age group of 30-39 years followed by in the 20-29 years. Out of 20, 17 patients resorted to use of cotton (cloth) gloves while the rest kept on using latex gloves despite adverse effects.
4. Among the 7 patients using PPE kits, the most common adverse effect was milliarria, erythema, furunculosis and folliculitis. In 1 patient, there was development of tinea cruris. The duration of use was more than 6 hours resulting into adverse effects. Maximum number of patients were in the 20-29 years followed by 30-39 years age group. All 7 were health care workers and continued using PPE kits and 5 took treatment from the dermatologist while the rest resorted to self-treatment.



**Fig. 1:** Urticaria over palms.

#### 4. Discussion

The pandemic of SARS-CoV-2 which started in 2019 has and is still creating havoc round the globe causing tremendous loss to lives, humanity and economy. The end doesn't seem near with successive waves spreading across countries and the menace further compounded by the emergence of mutations. Thus in view of the highly contagious nature of this virus, the preventive measures need to be continued with all the more vigour.<sup>7</sup> The inculcation of these preventive measures leads to a myriad of adverse cutaneous reactions and.<sup>8</sup> There is dearth on studies to assess the adverse skin reactions from using various PPE kits, masks and other protective and preventive measures and thus this questionnaire based study assumes further significance in providing possible ways to ameliorate the adverse effects. In our study, masks came out to be the most common reason among people causing adverse skin manifestations followed by regular hand washing and hand sanitizers. Various other studies have also reported masks (N95) as the most common reason.<sup>8,9</sup> This can be attributed to the mass awareness regarding modes of transmission of virus among population.

The role of regular hand washing and use of alcohol based hand sanitizers is extremely imperative in view of the role contact transmission of SARS-CoV-2 virus by contact. Furthermore the adverse effects are compounded by the use of latex gloves. The most common side effects were dry chapped skin followed by burning and itching sensation, vesiculation and aggravation of preexisting hand eczema among patients which was in concordance with various other studies.<sup>8,9</sup> Various factors leading to these have been stated like irritant contact dermatitis, IgE mediated hypersensitivity reactions to latex.<sup>10–12</sup>

The use of N-95 masks led to pressure sores, abrasions, acneiform eruptions and folliculitis in our study whereas other studies reported acne, nasal bridge scarring, rash and facial headache.<sup>8,13</sup> In N-95, N stands for "National Institute of Occupational Safety and Health, and "95" indicates its filtering efficiency. The main mode of spread of Covid-19

has been found to be droplet infection thus masks need to be worn for prolonged hours increasing the risk of adverse effects. Furthermore, the diameter of SARS-CoV-2 is between 80 and 120nm which on exit from the mouth assumes a droplet form increasing the size. The N-95 is 95% effective in filtering the particles of >300 nm and is the main armour against Covid-19.<sup>8</sup> Various factors which lead to adverse effects due to masks are humidity, temperature and the genetic make-up of the skin. The variation in these factors can explain the difference in the adverse effects seen in our study and other studies.

Lastly, PPE kits were implicated in the causation of erythema, furunculosis, miliaria and aggravation of tinea cruris. But other studies reported only minor or nil effects.<sup>8</sup> This again can be attributed to the high humidity and rising temperatures in atropical country like ours.

The menace of Covid-19 seems not to vanish easily and early proper detection and providing adequate treatment to the people, gauging the adverse skin manifestations to protective gear would be of great help.

#### 5. Conflict of Interest

The authors declare that there is no conflict of interest.

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None.

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