

## Original Research Article

# Clinical evaluation of mask induced dermatitis on health care workers during COVID-19 pandemic: a cross sectional study

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### ABSTRACT

**Background:** Mask induced dermatitis is common among health care workers now because of the obligatory use of facemask for a longer period during COVID-19, the clinical features vary. Very few studies could be conducted due to the COVID induced constraints. Studies regarding reactions to face masks in health workers published to date are limited and hence we decided to do this study. The objective of this study was to find out the clinical presentations of mask induced dermatitis due to long term use of facemask on healthcare workers during COVID-19 pandemic.

**Methods:** A cross sectional study was conducted among 40 healthcare workers attend our OPD with face mask for 6 months. After getting informed written consent clinical evaluation was made by history and dermatologic examination.

**Results:** Total 40 health care professionals between the age group of 21-50 years (17 females and 23 males) came to our OPD with complaints of itching and dryness with signs of erythema, scaling, papules for 6 months duration. Out of them, 15 (37.5%) patients had exacerbation of pre-existing dermatoses like atopic dermatitis, seborrheic dermatitis, chronic urticaria, acne. 10 patients (25%) had irritant contact dermatitis 7 patients (17.5%) had sweat-induced dermatitis, 4 patients (10%) had dermatitis due to sponge strip at the nasal bridge, 4 patients (10%) had dermatitis due to vehement use of ear loop involving retroauricular region.

**Conclusions:** This study showed that wearing face masks results in the development and aggravation of other skin diseases due to various causes. Itch can induce scratching and thus lead to inappropriate use of face masks, which could compromise their function.

**Keywords:** Face mask, Irritant contact dermatitis, Health care workers

### INTRODUCTION

In 1897, Jan Antoni Mikulicz-Radecki, a surgeon was the first to introduce cotton face masks for use during surgery.<sup>1</sup> They are designed for healthcare workers mainly surgeons, used to prevent the exhalation of pathogens into the surgical field and used to prevent human-to-human respiratory viral transmission.<sup>2-5</sup> The

documented that personal protective equipment (PPE), which is mostly used by healthcare workers, can harm the

use of face masks by the general public in 2003 during the SARS pandemic and in 2009 during the spread of H1N1 influenza.<sup>7</sup> Recently the WHO announced the pandemic of coronavirus disease 2019 (COVID-19).<sup>8</sup> The obligatory use of face masks for the general public increased all over the world. During the COVID-19 pandemic people have been using face masks for longer periods especially health care professionals. It is well skin.<sup>11-13</sup> However, there is little research into clinical evaluation of face masks induced complications. This

study showed the different clinical presentations of usage of different types of masks in health care workers.

**METHODS**

Questionnaires were printed and distributed to health care workers who attended our OPD during a period of 6 months from September 2020 to February 2021. Data collected included demographic data, attitudes to face mask use, type of masks used, mean duration of use, presence of symptoms, consequences, previous skin diseases, modalities applied to relieve, personal and family history of disorders such as atopic asthma, atopic dermatitis, pollinosis. After getting informed written consent clinical evaluation was made by history and dermatologic examination.

**RESULTS**

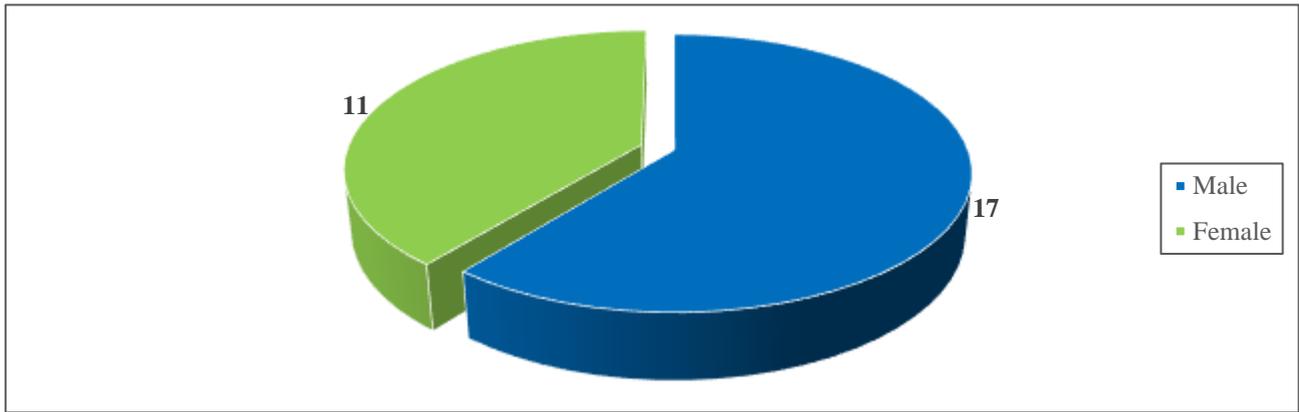
A total of 40 health care professionals between the age group of 21-50 years (17 females and 23 males) came to our OPD with complaints of itching and dryness with signs of erythema, scaling, papules for 6 months duration. Out of them, 15 (37.5%) patients had exacerbation of preexisting dermatoses like atopic dermatitis, seborrheic dermatitis, chronic urticaria, acne. 10 patients (25%) had irritant contact dermatitis, 7 patients (17.5%) had sweat-induced dermatitis, 4 patients (10%) had dermatitis due to sponge strip at the nasal bridge, 4 patients (10%) had dermatitis due to vehement use of ear loop involving retroauricular region ( Table 1).

**Table 1: Percentage of different face mask induced dermatoses.**

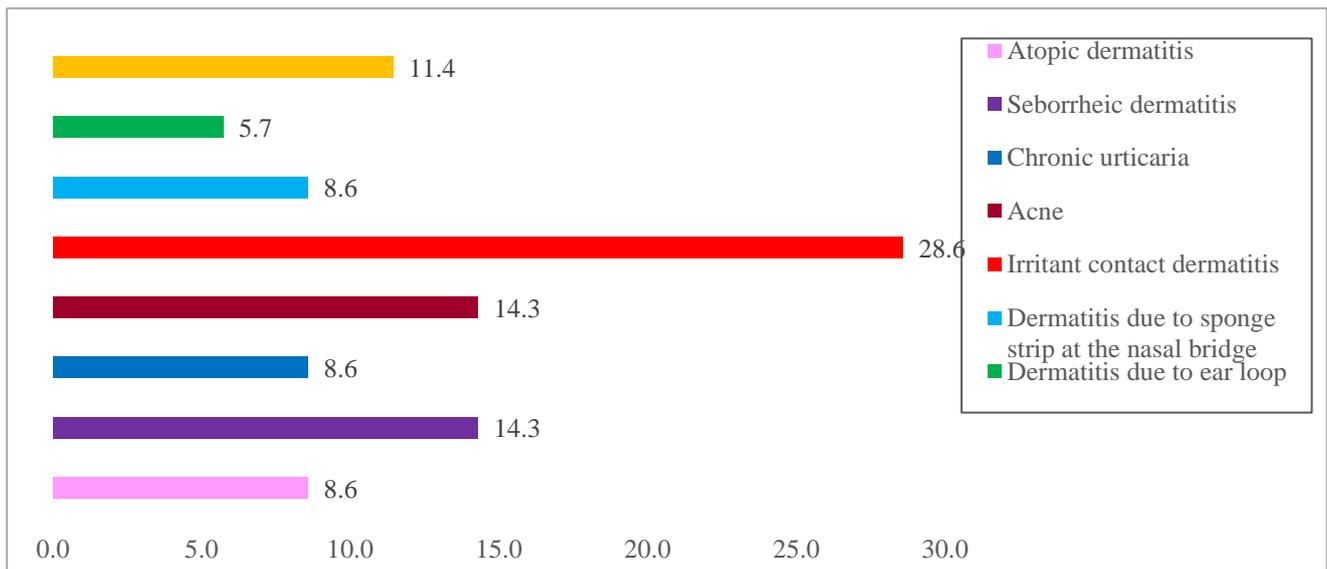
S. No.	Conditions	Numbers	%	
1	Pre-existing dermatosis	Atopic dermatitis	3	7.5
		Seborrheic dermatitis	5	12.5
		Chronic urticaria	2	5
		Acne	5	12.5
2	Irritant contact dermatitis	10	25	
3	Dermatitis due to sponge strip at the nasal bridge	4	10	
4	Dermatitis due to ear loop	4	10	
5	Sweat induced dermatitis	7	17.5	



**Figure 1 (a-e): Face mask induced dermatoses.**



**Figure 2: Gender-wise distribution of cases.**



**Figure 3: Percentage of different facemask induced dermatoses.**

**DISCUSSION**

The current study is to assess dermatoses in the health care workers induced by wearing face masks and to evaluate the clinical characteristics of these type of reactions. Compared to previous studies there are much higher percentages observed in the current survey, this could be due to the types of face mask used and variations in duration of mask wearing.<sup>2-4</sup> In the current study approximately 20% of young people wearing face masks reported with symptoms. Foo et al analysing healthcare workers during the SARS pandemic in 2003 in Singapore reported that 51.4% experienced dermatitis induced by face masks.<sup>11</sup> Moreover, a recent study from China documented itch due to face masks in 14.9% of healthcare workers, a burning sensation in 3.7% and pain/pricking in 3.2% of subjects.<sup>14</sup> These are much higher percentages than observed in the current survey; this could be due to the types of face mask used and variations in duration of mask wearing. Healthcare workers predominantly used professional devices, such as N95 masks and half-face and full-face respirators. During

the COVID-19 pandemic PPE is usually used for long periods of time by healthcare workers. Face masks in the general population are usually worn for a much shorter time, generally only when people are in public spaces. Since recreational activities are reduced during the viral pandemic, the period of time the public are using masks is usually limited to the duration of essential activities. In addition, it was observed that the frequency of symptoms increased with the duration of face mask wearing, being significantly more common in people using face masks for 5 hour or longer. In an experimental study by Roberge et al of a group of 20 healthy people wearing surgical masks during continuous walking on a treadmill at a low-moderate work rate (5.6 km/hour) for 1 hour, symptoms occurred in 7% of participants and an additional 11% experienced skin irritation.<sup>1</sup> They drew the conclusion that surgical masks are generally well tolerated. The current data agrees with those results. Considering itch reported only as a bothersome symptom, three layers surgical mask appeared to be the most convenient and best tolerated type. The current study documented that sensitive skin and atopic predisposition were significantly

related to increased risk of development of symptoms. Moreover, the risk of face mask-induced dermatitis was linked with the presence of facial dermatoses, including atopic dermatitis, seborrhoeic dermatitis and acne. Face mask and headgear worn tightly for prolonged hours result in ACD, ICD, pressure urticaria, friction dermatitis, abrasions and aggravation of pre-existing dermatoses. Retro-auricular skin is vulnerable to frictional dermatitis due to ear loops of the facemask. However the judicious use of mask with proper selection of type of masks can prevent mask induced dermatitis. The patients were treated with steroids, antihistamines and the symptoms were improved.

### Limitations

The limitation of this study was that the patch test was not done due to the COVID 19 pandemic.

### CONCLUSION

This study showed that wearing face masks results in the development and aggravation of other skin diseases due to varying cause. Symptoms can induce scratching and thus lead to inappropriate use of face masks, which could compromise their function.

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*Ethical approval: The study was approved by the institutional ethics committee*

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