

Mask Acne (Maskne): A New Variant of Acne Mechanica

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Mask acne (maskne) is the new variant of acne mechanica, associated with personal protective equipment usage in healthcare workers. Widespread daily use of facial masks for many hours during the COVID-19 pandemic has been linked to the development of new acne or exacerbation of the previous acne over the masked area, with a distinct pattern, referred to as the “O” zone area around the mouth. Maskne can be caused by friction, irritation, local increase in skin temperature, and humidity, the same mechanism as observed in acne mechanica.

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Mask acne (maskne) is the new variant of acne, associated with personal protective equipment usage in healthcare workers^(1,2). Widespread daily use of facial masks for many hours during the COVID-19 pandemic has been linked to the development of new acne or exacerbation of the previous acne⁽³⁾.

Masks are essential for the prevention of COVID-19, however, prolonged daily use of facial masks can lead to modification of facial skin microenvironment and can trigger many facial dermatoses. Itchiness on both cheeks is the most common symptom. Most common skin disease is new-onset contact dermatitis (33.94%), followed by new-onset acne (16.97%) and aggravation of preexisting acne (16.97%). Long durations of wearing facial mask, which is more than six hours per day, and cotton facial mask ($p < 0.001$) significantly increases inflammatory acne lesions flare up⁽⁴⁾. Therefore, it can be concluded that “maskne” is the new variant of acne and is caused by long durations of wearing a facial mask⁽⁵⁾.

Pathophysiology

No studies to date have evaluated the exact pathophysiology of maskne, but observational data suggest “maskne” can be caused by friction, irritation, changes in local skin temperature, humidity, and skin microflora dysbiosis, which are the same mechanisms as observed in acne mechanica. Long durations of wearing a facial mask can increase local skin temperature and affect sebum excretion rate. One study reported a 10% increase in sebum excretion for each one-degree rise in skin temperature⁽⁶⁾. In addition, the high humidity and pressure from wearing facial mask can cause irritation, swelling of epidermal keratinocytes, and hair follicle occlusion, all of which contribute towards acne flares⁽⁷⁾. Wearing a mask induces microenvironment changes in the skin via an increase in skin temperature, erythema, skin pH, transepidermal water loss, and sebum excretion^(8,9). Those are comedogenic factors, capable of promoting *Cutibacterium Acnes* multiplication and immune response leading to the formation of inflammatory papules and pustules of acne. Furthermore, dysbiosis of facial skin microbiota also leads to selection of virulent and pathogenic *Cutibacterium acnes* strains causing more cutaneous inflammation^(10,11). Therefore, maskne is a new site of presentation of acne mechanica.

Clinical

For the first time, “mask acne” has been diagnosed in healthcare workers during the beginning of COVID-19 pandemic, and later widespread mask usage in the general population has resulted in the disease becoming more widely recognized

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as “maskne”. Maskne can occur in people with a previous acne history of any kind, such as acne vulgaris, hormonal acne, and cosmetic acne, or “de novo” in people who never had acne before. Most patients having mask related acne in the COVID-19 pandemic are female with more than 80%⁽¹²⁾.

Patients showed acne flares associated with “maskne” after they had worn facial masks for more than four hours per day over two months⁽⁷⁾. Maskne is a new variant of acne that causes breakout of comedones, inflammatory papules, and pustules in the areas covered by the facial masks, which are the jaw, cheeks, nose, chin, and around the mouth (Figure 1, 2).

Diagnosis

Clinical criteria for diagnosis “maskne” are suggested by Teo as one of the followings 1) de novo acne occurred within six weeks after regular facial mask wearing, or 2) exacerbation of the previous acne over the masked areas, with a distinct pattern, referred to as the “O” zone area, after regular facial mask wearing (Figure 3). The diagnosis is done after exclusion of differential diagnoses, including perioral dermatitis, seborrheic dermatitis, pityrosporum folliculitis, and acne rosacea⁽¹³⁾. In the author’s opinion, maskne lesions can be found in either O-zone or U-zone or any areas that are covered by facial mask.

Treatment

Treatment for maskne depends on the extent and the severity of acne, and the response to the previous treatment. Treatment for mild form of maskne includes spot treatment with topical benzoyl peroxide, salicylic acid, sulfur, alpha hydroxy acids, and retinoid. The effects of these topical treatments are likely to be amplified under the facial mask. This leads to irritation, dryness, and other adverse effects. To avoid irritation in sensitive skin, all these topical treatments should be applied only at night after having already taken off the facial mask. New hydrogel carrier formulations of topical retinoid/antibiotic combination can minimize local irritation^(3,14). During the period of treatment, patients should apply moisturizer every day to reduce irritation from mask and topical treatment. Many substances can be added in moisturizer such as Ginkgo biloba, green tea, aloe vera, allantoin, and licochalcone to reduce inflammation⁽¹⁵⁾ as well as sebum-controlling agents such as nicotinamide or zinc acetate, which may minimize excessive sebum production and reduce the symptoms of acne^(16,17). As for moderate form of maskne, treatment with topical and systemic

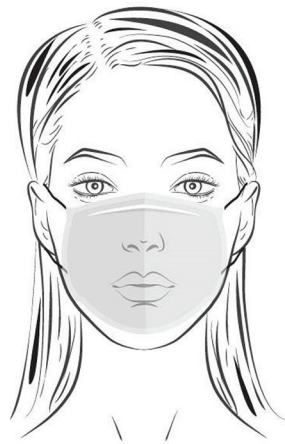


Figure 1. Facial mask covered area of nose, mouth, both cheeks, and chin.



Figure 2. Multiple comedones, inflammatory papules, and pustules on area covered by mask.

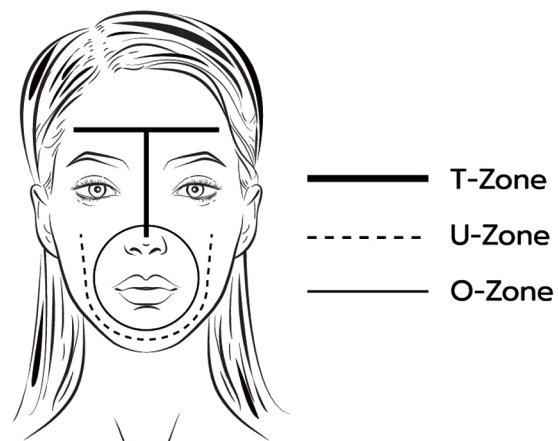


Figure 3. Maskne has a specific distribution on O-zone or U-zone or both.

antibiotics should be considered⁽¹⁴⁾. For recalcitrant or severe form of maskne, dermatologists should consider a course of oral isotretinoin.

Patients who have preexisting acne before exacerbation with maskne, should be investigated for the causes of acne such as genetic, hormonal disorder, or cosmetic problems for proper treatment and further prevention.

Prevention

The COVID-19 pandemic has changed many things about people daily lives. Wearing facial mask every day is one of the new routine practices. Spending more time at home and limiting facial mask usage is the best method of preventing “maskne”. With more understanding about the pathophysiology of this problem, the author suggests the following maskne prevention tips:

1. Choose proper facial mask for each person, natural fibers such as cotton, linen, silk, and lyocell offer better breathability compared to synthetic fibers. One study demonstrated that wearing a cloth mask showed a lower risk of adverse skin reactions such as acne or rash, compared to a surgical mask⁽¹⁸⁾. However, the stickiness of natural fibers may increase textile skin friction in people with sensitive skin. Newer synthetic bio-functional textiles have a high evaporation/cooling coefficient, which will minimize textile skin friction. Some synthetic textiles that incorporate silver, zinc oxide, and copper oxide also have a broad spectrum of biocidal properties⁽¹⁹⁾.

2. Avoid dark colored masks that retain heat and increase skin temperature⁽¹⁴⁾.

3. Clean reusable mask frequently with hypoallergenic clothes detergent, as residue from these products may irritate the skin.

4. Change disposable mask every day.

5. Avoid continuous usage of mask for more than six hours^(4,5).

6. Use minimal skin care, especially products containing oil. The more skin care products applied to skin under a mask, the more likely it is to cause irritation and maskne.

7. Taking a break from makeup can significantly reduce the risk of hair follicle occlusion and skin irritation under facial mask.

8. Using gentle cleanser to wash the face in the morning and evening does not damage the skin barrier or result in sebum overcompensation, but it can clean skin more effectively, which may help to manage acne symptoms⁽²⁰⁾.

9. Apply a fragrance free, oil-free, non-

comedogenic moisturizer to maintain an intact skin barrier function before wearing a face mask.

Using face masks for COVID-19 protection is one of the new normal routines. It is very likely that dermatologists will see a rise of patients presented with “maskne”. Full understanding of the pathophysiology of “maskne” can help dermatologists to give clearer explanation of this problem and give better suggestions towards skin care selection and proper treatment for their patients.

What is already known about this topic?

“Maskne” is the new variant of acne associated with long durations of wearing facial mask. The clinical manifestation of maskne usually presented with breakout of comedones, inflammatory papules, and pustules in areas covered by the facial mask such as the jaw, cheeks, nose, chin, and around the mouth.

What does this study add?

This study reviews new knowledge of pathophysiology, clinical presentation, criteria for diagnoses, proper management, and “maskne” prevention.

Conflicts of interest

The author declares no conflicts of interest.

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