



## MASKNE: ACNE PRODUCED BY THE USE OF MASKS IN TIMES OF PANDEMIC

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### ABSTRACT

**Background:** Maskne is a term that has arisen in the period of the COVID-19 pandemic. One of the methods to combat the pandemic is through the constant use of personal protection elements. The term Maskne refers to the subset of mechanical acne, which is caused by the constant use of masks of this type. **Methodology:** A narrative review was carried out through various databases from January 2019 to October 2021; the search and selection of articles was carried out in journals indexed in English. Keywords were used: Maskne, masks, pandemic, COVID-19. **Results:** The dysbiosis of the cutaneous microbiota produced by the constant use of masks, leads to the selection of virulent and pathogenic strains of *C. acnes*. One of the effects of the constant use of masks is the increase in skin temperature, contributing to the development of fungal and yeast infections. Botanical active ingredients with antimicrobial, sebum regulating, antioxidant and anti-inflammatory properties are the therapeutic approaches proposed to date. **Conclusions:** This review offers pathophysiological, diagnostic and therapeutic measures for a better updated approach to patients suffering from Maskne.

**KEYWORDS:** Maskne; Masks; Pandemic; COVID-19.

### INTRODUCTION

Maskne is a term that has been presented in the period of the COVID-19 pandemic, from which it has recently been gaining popularity by researchers and related areas.<sup>[1]</sup>

One of the methods to combat the pandemic is through the constant use of personal protection elements, from which we want to rule out the use of reusable cloth masks. The term Maskne refers to the subset of mechanical acne, which is caused by the constant use of masks of this type.<sup>[1,2]</sup>

Modification of the skin's microenvironment, whether by thermal regulation or dysbiosis, is relevant to understand its pathophysiology and thus attribute new treatment approaches, bearing in mind that not all Acne treatment approaches are effective for Maskne.<sup>[1,2,3]</sup>

Cotton-based masks were previously recommended for dermatological patients, but recently a lack of efficacy has been seen in the context of face masks. Due to the high load of biofluids in the nasal and oral orifices, subjective discomfort has increased, related to greater moisture saturation and stickiness.<sup>[2]</sup>

The prolonged contact time between the tissue and the skin, directly proportional to the risk of a mask, is one of the main causes of the development of Maskne.<sup>[4]</sup> Given the increase in cases of Acne developed by the constant use of Masks, it was decided to carry out this work in order to provide accurate information on the pathophysiological mechanisms involved in the disease and possible diagnostic and therapeutic guidelines that could be implemented.

### MATERIALS AND METHODS

A narrative review was carried out, in which the PubMed, Scielo and ScienceDirect databases, among

others, were searched. The collection and selection of articles was carried out in journals indexed in English from the years 2019 to 2021. As keywords, the following terms were used in the databases according to the DeCS and MeSH methodology: Maskne; masks; pandemic; COVID-19. In this review, 66 original and review publications related to the subject studied were identified, of which 20 articles met the specified inclusion requirements, such as articles that were in a range not less than the year 2019, which were articles of full text and that they will report on Acne produced by the use of masks in times of Pandemic. As exclusion criteria, it was taken into account that the articles did not have sufficient information and that they did not present the full text at the time of their review.

## RESULTS

### PATHOPHYSIOLOGY OF THE MASKNE

Among the microorganisms that have been most seen in the colonization of acne development, we find *Staphylococcus aureus*, since they have a well-established superantigen effect on eczema outbreaks. Our most recent knowledge of the pathogenesis of acne has shifted from *Propionibacterium acnes* to Colonization of cutibacterium acnes (*C. acnes*) from sebaceous follicles.<sup>[4,5]</sup>

Dysbiosis of the skin microbiota leads to the selection of virulent and pathogenic *C. acnes* strains and the activation of innate immunity that causes skin inflammation.<sup>[4,6]</sup>

The fungal organisms that are most ruled out for the development of acne due to the use of masks are the *malassezia furfur*, since it is a commensal with healthy skin, and plays an important role in the etiopathogenesis for seborrheic dermatitis and *pityrosporum folliculitis*.<sup>[7]</sup>

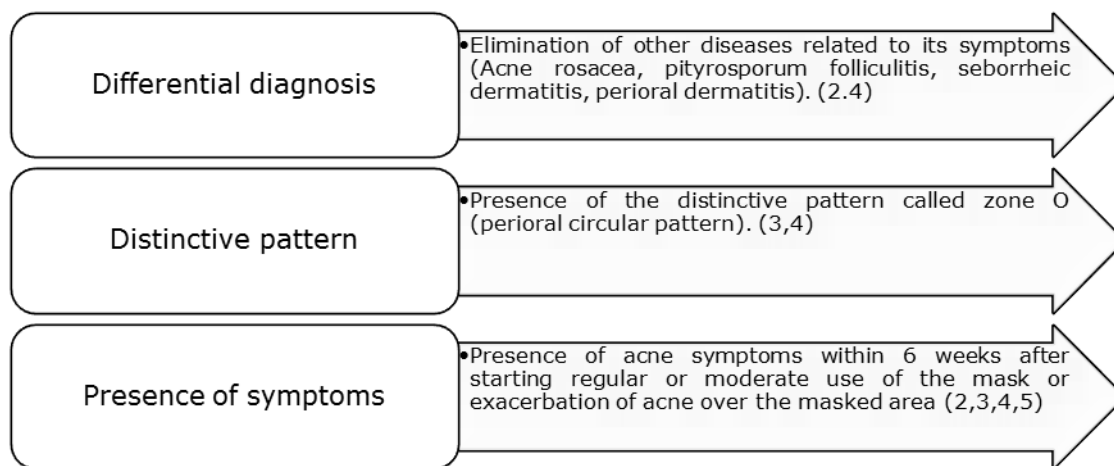
One of the effects of the constant use of masks is the increase of the temperature in the skin, which would lead to a greater retention of sweat in normal individuals, worsening the symptoms in those patients who present facial hyperhidrosis. This is an important etiopathogenic factor for the development or exacerbation of atopic dermatitis, caused by specific IgE-mediated hypersensitivity (type I) to sweat content.<sup>[8]</sup>

These aspects related to thermal changes (humid and warm) would contribute to shaping an adequate environment for the development of fungal and yeast infections, including *malassezia* and *candidiasis*, both of which begin with healthy skin.<sup>[9]</sup>

Different types of masks are created based on textile dyes, so it must be assumed whether or not these would influence the development of allergic contact dermatitis in areas of contact with the mask. Disperse dyes are a leading cause of textile-related allergy patch test positivity.<sup>[9,10]</sup>

### RELEVANT ASPECTS IN DIAGNOSIS AND MANAGEMENT

Proposed clinical diagnostic criteria for Maskne.



For the maintenance of a healthy skin barrier or microbiome, the use of mild antibacterial cleansers and moisturizers formulated as prescription emollient devices is recommended.<sup>[11]</sup> There are different products to manage acne that would impair the handling of Maskne, among them we find retinoids,  $\alpha$ -hydroxy acids, sulfur, salicylic acid, benzoyl peroxide. For this reason, not all existing products would contribute positively to management, on the contrary, they would attribute a poor prognosis for their management by aggravating the existing picture.<sup>[12]</sup>

Among the treatments proposed to date to treat Maskne, we find botanical active ingredients with antimicrobial, sebum regulating, antioxidant, and anti-inflammatory properties. In order to ensure better tolerance and efficacy of the drug by minimizing local irritation, hydrogel carrier formulations of combined topical compounds of retinoids and antibiotics can be additionally implemented.<sup>[13]</sup>

Currently, there is an increase in the use of products implemented as sunscreen, for this reason this factor could be attributed as a risk factor for the development of

maskne, since the occlusion that occurs in the use of masks could increase the sensitivity and comedogenicity of sunscreen.<sup>[14,15]</sup>

Different masks have been made that could minimize the use of sunscreens, in order to avoid both extremes. On the one hand, the use of sunscreen and a mask could aggravate the existing picture of acne and on the other extreme, not using or applying sunscreen could have consequences for the care of our skin.<sup>[16]</sup>

The use of masks with ultraviolet protection factor, should replace the use of sunscreen, avoiding constant reapplication. This factor is relevant only in the lower half of the face, since it is the one with the mask. For this reason, when exposing the upper half, it would be advisable to apply sunscreen in the areas that are not protected by the masks, in order to avoid complications and favor better skin care.<sup>[17]</sup>

The natural fibers of the masks absorb moisture, having a higher saturation of liquids. Contributing to the alteration of the bacterial flora by contributing to a greater spread. The use of this type of mask contributes to greater discomfort and a feeling of stickiness. To avoid the spread of biofluids, masks based on synthetic biofunctional textiles should be used, since they have a high evaporation and cooling coefficient and are resistant to water.<sup>[18]</sup>

For people with topical conditions, the use of this type of mask is recommended, since the high number of threads and tightly woven fabrics have a higher ultraviolet protection factor (UPF) and minimize friction between the fabric and the skin.<sup>[19]</sup>

Among the recommendations that are proposed for the realization of the masks we find.<sup>[3,20]</sup>

1. Cloth masks should emit abrasive metal parts that also contribute to nickel sensitization.
2. Reusable cloth masks must allow movement when speaking, with minimal displacement over the orifices.

It has been shown that within the areas of the skin the one that is most affected by the use of masks is the nasal bridge, being the most common site of skin damage due to personal protective equipment, following the cheeks. As demonstrated by the study carried out by Lan et al, in which a survey of 542 doctors and nurses was conducted during the COVID-19 pandemic. Among the most common symptoms and signs we find.<sup>[7,20]</sup>

1. Dryness / tightness
2. Flaking
3. Sensitivity
4. Erythema
5. Itching
6. Maceration
7. Fissure
8. Papula

9. Burning / pain

## DISCUSSION

Dysbiosis of the skin microbiota produced by the constant use of masks leads to the selection of virulent and pathogenic strains of *C. acnes*. One of the effects of the constant use of masks is the increase in skin temperature, contributing to the development of fungal and yeast infections. Botanical actives with antimicrobial, sebum regulating, antioxidant, and anti-inflammatory properties are the therapeutic approaches proposed to date.

The study by Damiani et al, which enrolled a total of 66 patients, 30 patients with acne and 36 patients with rosacea. They demonstrated that after 6 weeks of mask and quarantine, patients with rosacea showed a worsening in both the results reported by the doctor and the patient, reporting a decrease in the quality of life.<sup>[5]</sup> As this study reports, face masks appear to trigger acne and rosacea flare-ups.

A strength of the current study is the methodology implemented, with respect to the literature search, and steps in the selection of relevant articles, quality assessment and data extraction. However, this study has several limitations, which should be taken into account before reaching a conclusion, within these are the little evidence from analysis of clinical trials to determine the appropriate therapeutic approach for each patient, taking into account possible comorbidities. That each one could have.

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