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LETTER TO THE EDITOR

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Acne flare-up due to mask wearing: A current pandemic scenario and its relationship with sleep

To the Editor,

The current COVID-19 pandemic, officially announced in March 2020, has resulted in drastic lifestyle changes. One of these, the necessity of wearing masks, has resulted in a significant increase in acne flare-up. In addition to considering some mechanisms related to acne and masks, we call attention to the secondary psychological damage that the current pandemic has produced in some individuals. As sleep has been significantly affected by the pandemic, we suggest that sleep impairment might have played a part in triggering acne[1] through possible sleep-related cutaneous dysregulation.

Acne is a widely prevalent inflammatory skin disease, in which the pilosebaceous units play an important role. Sebum accumulation, obstruction of the units, and *Cutinubacterium acnes* proliferation all participate in the pathophysiology of acne.[2]

The frequent use of face masks during the day for long periods could increase humidity and sebum production in the sebaceous glands and its concentration on the surface of the skin, prompting acne lesions or aggravating an existing condition.[3-6]

The current pandemic is having a significant negative impact on people's routines, including on eating habits, self-care and self-esteem, and resulting in physical and psychological impairments. We highlight the role of sleep, a crucial mechanism of organism recovery, that could play a part in this outbreak of acne. Poor sleep and sleep deprivation could have a significant impact on endocrinological regulation as a whole, which includes skin homeostasis, and consequently could trigger the pathways of acne development.[2] Acne can be strongly associated with hormonal imbalance, which explains its high prevalence in the teenage population. States of hormonal dysregulation during other stages of life could also be related to triggering acne.[2] Cortisol, for example, increases due to poor sleep, and stressful conditions could promote an inflammatory state possibly associated with an increase in acne lesions. Moreover, individuals that are experiencing greater sleep distress could present impaired sebum regulation caused by changes in testosterone levels.[3]

Facial sebum dysregulation may be enhanced by poor sleep, and can be a precursor of acne development,[3,4] which could be further increased by the use of masks. The higher temperature and humidity on the surface of the skin caused by mask wearing have been described as contributors to sebum concentration.[5-7] It has been reported that an increase of 1°C in facial temperature can increase sebum secretion by 10%, which aggravates acne.[6,7] The role of higher humidity seems to have effect on skin hydration and consequent pore occlusion, as well as being related to inflammation and skin imbalance.[7] A recent study during the pandemic has shown that five patients using masks for at least 4 hours a day for 2 months developed acne. The principal lesions were comedones and papules located on the nose and cheek, with symptoms that included itching and seborrhea. More severe lesions, such as cysts, were less prevalent, as was acne in other regions.[6]

Some studies point to sleep disturbance being related to increased oxidative stress[8] and a higher inflammatory state that could be implicated in acne development. These factors and other comprise what has been called the "skin exposome",[8] a term that includes all types of environmental exposures or other factors than can induce or aggravate skin conditions, including poor sleep. Environmental and endogenous aspects associated with the skin exposome may be enhanced by the use of masks. Therefore, exposome-related factors, such as facial thermal and sebum dysregulation, as well as changes in the skin microbiota, could increase acne (alongside climate and pollution factors, and those associated with sleep).[9,10] The use of masks could result in a higher concentration of CO2 in the transepidermal surface in addition to changes in temperature and humidity.[11–13] Air pollution and its associated gases that include CO2 have already been associated with skin exposome imbalance.[10] This altered dissipation of gas during breathing due to mask use could be an additional factor triggering and aggravating acne.

Poor sleep seems to further aggravate the increased acne caused by the wearing of masks. Although the evidence is not totally clear, sleep distress has been associated with an inflammatory state that may be a trigger to worsen acne.[1] The mechanical and local pathways related to higher local sebum concentration increased humidity and obstruction of the pilosebaceous units of the face caused by masks could therefore be further imbalanced in individuals who have sleep deprivation.[5,6,14] Circadian regulation is already known as a regulator of several skin functions, including those of the sebaceous glands and body temperature.[9,14]

Concerns regarding the pandemic, altered routines, and changes in eating habits could be additional contributors to the impairment of skin homeostasis. People who are worried about the risks of COVID-19 transmission, even if they spend more time at home or wear a mask for a prolonged period when they go out may be less concerned about skin care. In addition, anxiety and depression may

have an effect on sleep quality, or even make individuals less concerned about skin care due to reduced self-esteem. These could be risk factors for the development or worsening of acne. In respect of sleep, a bidirectional relationship may exist[1], with the presence of acne having an impact on sleep due to concerns about appearance, which in turn promotes acne.

In conclusion, in this current pandemic scenario, when greater oxidative stress emerges due to psychological complaints and sleep deprivation, the maintenance of routine dermatological care is crucial to maintain skin homeostasis and minimize cutaneous issues.[15] Skin repair can be enhanced by good sleep[15]; thus, medical intervention by a sleep specialist may be required. Further studies are warranted to better elucidate the role of sleep in relation to mask wearing and acne, and to develop better medical practice which aims to offer a better quality of life to those individuals suffering from this condition during the current pandemic.

KEYWORDS

acne, dermatology, face masks, pandemic, sleep

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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