

A response to “Male balding is a major risk factor for severe COVID-19”

To the Editor: We read with great interest Male Balding is a Major Risk Factor for Severe COVID-19 by Lee et al¹ regarding androgenic alopecia as a risk factor for COVID-19 severe symptomatology. A recent study by Wambier et al² observed similar findings regarding androgenic alopecia and COVID-19. Yet, the relationship between scalp health, androgenic alopecia, and COVID-19 has not been explored. We examined the current, yet limited, literature regarding the role of the scalp in preventing transmission of COVID-19.

Trüeb et al³ describes the importance of scalp and hair health. The scalp has a large number of terminal hairs and microbes creating a unique microenvironment. Hair is a mechanical barrier, blocking ultraviolet radiation from reaching the scalp skin and facilitates moisture retention.³ Aging and male sex hormones can compromise hair growth, resulting in androgenic alopecia. Alteration of hair production and pre-existing photo-aging results in scalp atrophy and increased exposure to ultraviolet radiation.³ These effects change scalp volume, alter cellularity of the epidermis, and elevate dermal inflammatory cells.³ Premature balding increases risk of scalp damage, as there is a loss of elasticity and moisturized protective barrier. Furthermore, scalp balding increases the expression of oxidative stress markers resulting in DNA damage.³ The combination of factors sensitizes scalp skin environmental stress and pathogens, including viruses such as COVID-19.¹⁻⁴

COVID-19 is spread via mucosal and skin barriers. ACE2 was recently identified as a vital receptor for cell entry of SARS-CoV-2.⁴ Cells with high levels of ACE2 expression, such as pulmonary pneumocytes and keratinocytes, are vulnerable to infections.^{2,4} Increased expression of ACE2 in epidermal keratinocyte cells has been indicated as a possible transmission route of SARS-CoV-2, particularly in conditions compromising skin barrier function.⁴ ACE2 receptor expression is influenced by male sex hormones.² Androgenic hormones play a central role in the pathogenesis of androgenic alopecia, which results in loss of an important scalp protective barrier. Scalp health may be preventative against the transmission of COVID-19, as male pattern balding has been implicated in the development of severe symptomatology.¹⁻³ Through suppression of male sex hormones, medications

preventing androgenic alopecia may alter ACE2 receptor expression. Accordingly, maintenance of scalp health may be essential in preventing transmission by sustaining a robust skin barrier.²

Scalp hair is a potential protective factor against COVID-19 transmission. Studies are needed to evaluate this relationship, as understanding the link will aid in the creation of appropriate public health measures and treatment options. Potential considerations for exploration include the association between COVID-19 and the effects in other etiologies of alopecia including alopecia areata and frontal fibrosing alopecia. Lastly, human culture determines body coverage with clothes; however, the scalp is usually exposed, and, along with the face and acral areas, become the only zones of temperature control. Thus, there may be a link between neurovascular responses to temperature changes from the scalp and disease incidence that peak seasonally in subtropical areas including human coronavirus strains and potentially COVID-19.⁵ Further research is warranted to study the link between hair coverage and systemic disease.

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