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## Androgenetic alopecia in COVID-19: Compared to age-matched epidemiologic studies and hospital outcomes with or without the Gabrin sign

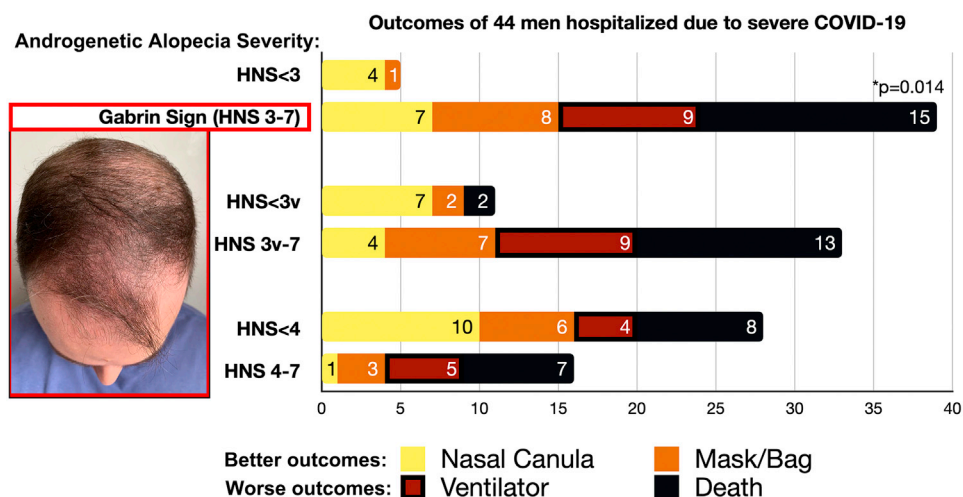


*To the Editor:* We greatly appreciate the various comments to our original article.<sup>1</sup> We also would like to thank dermatologists worldwide who have contributed to the knowledge of COVID-19 and androgenetic alopecia (AGA). Attempts to compare data with other epidemiologic studies are interesting, but caution must be used and attention to detail is required. For example, Nanes<sup>2</sup> attempted comparisons using the remote Hamilton scale without converting scores to the current Hamilton-Norwood scale (HNS). Nanes also attempted to compare studies that used scores from dermatologist examination with studies that used self-administered surveys as their methodology.<sup>2</sup> Refined comparative analyses were available in the Supplementary Materials of our original article (available via Mendeley at <https://dx.doi.org/10.17632/jk63cthxbr.2>), which included a disclaimer.<sup>1</sup>

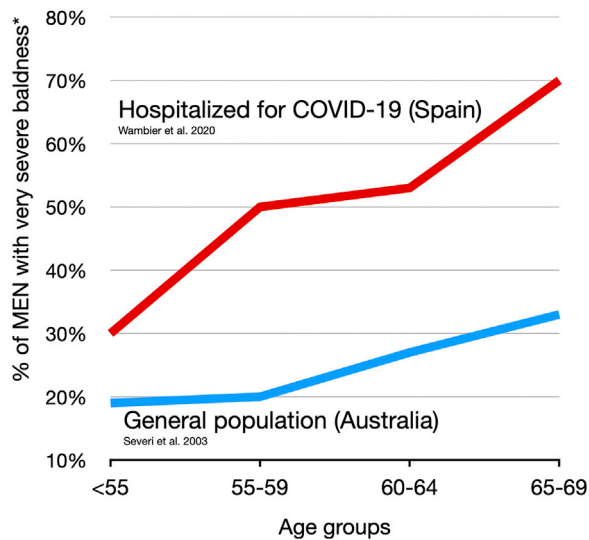
We would like to motivate other groups to evaluate AGA in their populations, specifically comparing outcomes in COVID-19—positive individuals. For example, our Indian colleagues, in a pilot

observational prospective study (raw data available via Mendeley at <https://dx.doi.org/10.17632/jdkx76y8fz.1>), examined outcomes in admitted patients with COVID-19 by AGA severity. In their cohort of 44 men admitted for severe COVID-19, all patients had clinically significant AGA. However, the most severe outcomes (respiratory failure requiring ventilators or fatal outcomes) happened when HNS was greater than 2. One patient was 45 years old and had no previous comorbidities; he required prolonged intensive care unit stay due to ventilator use and had an HNS score of 3v. Thus, in general terms, we prefer to classify patients with severe AGA (HNS score, 3-7) as having the Gabrin sign (Fig 1). This definition of the Gabrin sign is currently being used as an inclusion criterion in a randomized controlled clinical trial for early COVID-19 therapy (NCT04446429).

A comparison of proportions by age range (50-69 y) and severity of HNS with the Norwood study<sup>3</sup> shows an increase of relative proportions for an HNS score of 2 to 7 of 7%, HNS score of 3 to 7 of 26%, and HNS score of 4 to 7 of 33%. This gap becomes particularly obvious when comparing the frequencies of HNS scores of 4 to 7 in the age range of 55 to 69 years (Fig 2),<sup>4</sup> which is the age group that contains the median age of the 122 men hospitalized with COVID-19.<sup>1</sup> Severe AGA in young men also



**Fig 1.** The Gabrin sign. Severe AGA with an HNS score of greater than 3 in the context of COVID-19 infection is associated with worse hospital outcomes. The photograph shows a 37-year-old man hospitalized in Brazil for severe COVID-19, without comorbidities; he required a ventilator for 10 days. The bars depict outcomes of a pilot study performed in India in May 2020 among 44 men who had AGA scored with HNS. The Gabrin sign was associated with worse hospital outcomes (use of ventilator and deaths), Fisher's exact test,  $P = .014$ . All men had an HNS score of greater than 1. Only men with the Gabrin sign had worse outcomes (red and black bars). Proportions of worse outcomes increased with higher HNS scores (HNS score of 3-7, 62%; HNS score of 3v-7: 67%; and HNS score of 4-7: 75%). AGA, Androgenetic alopecia; HNS, Hamilton-Norwood scale.



**Fig 2.** Age-matched comparison of AGA of very severe baldness between the Australian 2003 data (general population) versus the Spanish 2020 data (hospitalized men with severe COVID-19). Patients with COVID-19 showed higher frequencies of very severe baldness at all age groups. The gap significantly increases after 55 years. The majority of patients hospitalized because of severe COVID-19 older than 55 years presented with very severe baldness. Very severe baldness accounted for “frontal and vertex” in the data from Severi et al.<sup>4</sup> and HNS score of 4 to 7 in the data from Wambier et al.<sup>1</sup> More details are available via Mendeley at <https://dx.doi.org/10.17632/jk63cthxbr.2>. AGA, Androgenetic alopecia.

confers increased vulnerability. To further exemplify this, we present in this reply letter one of our unpublished patients from Brazil: a previously healthy 37-year-old physician (HNS score of 5) (depicted in Fig 1) with no previous comorbidities; he required hospitalization for 21 days, which included 16 days in the intensive care unit (ventilator for 10 days and hemodialysis for 5 days).

Because vaccines are still not available and the epidemic is affecting men disproportionately, particularly bald individuals, more emphasis could be given to investigations directed at antiandrogen therapies, which are routinely prescribed both for hair loss and benign prostatic hyperplasia as the standard of care (such as dutasteride and finasteride). Finally, severe AGA, (HNS score, 3-7)—the Gabrin sign—is an objective phenotype that reflects individual androgen sensitivity throughout decades of life. AGA is associated with individual vulnerability to severe acute respiratory syndrome

coronavirus 2 infection through the androgen gateway.<sup>5</sup> It is remarkable that severe outcomes such as the requirement for a ventilator and/or fatalities have occurred in men with this phenotype without other known comorbidities at younger age groups, such as 35 to 45 years.

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Funding sources: None.

Conflicts of interest: None disclosed.

IRB approval status: Not applicable.

Reprints not available from the authors.

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