

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection is likely to be androgen mediated



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Key words: 5- α reductase; ACE2; androgen receptor; androgenetic alopecia; angiotensin converting enzyme 2; COVID-19; dutasteride; finasteride; human skin; retinoids; antiandrogen therapy; SARS-CoV-2; TMPRSS2; transmembrane protease serine 2.

Abbreviations used:

ACE2:	angiotensin converting enzyme 2
COVID-19:	coronavirus disease 2019
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2
TMPRSS2:	transmembrane protease, serine 2

Coronavirus disease 2019 (COVID-19) pandemic fatalities are rare before adrenarche/puberty (<10 years of age), and the vulnerability of males to severe disease¹ has been constantly reported over the past months of pandemic.

The first biologic step required for potential infectivity of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the priming of the spike proteins by transmembrane protease, serine 2 (TMPRSS2). Although other proteases have been described to activate the spikes in vitro, only TMPRSS2 activity is regarded as essential for viral spread and pathogenesis in the infected hosts.² TMPRSS2 may also cleave angiotensin converting enzyme 2 (ACE2) for augmented viral entry.³

Androgen receptor activity has been considered a requirement for the transcription of the TMPRSS2 gene because no other known TMPRSS2 gene promoter has been described in humans to date.^{4,5}

Male vulnerability may be further enhanced by X-linked inheritance of genetic polymorphisms (androgen receptor and ACE2 genes loci are in chromosome X). Obvious dermatologic signs of hyperactivation of androgen receptors are pattern reduction of density of scalp hair, increased density of facial and chest hair, acne, and oily skin. Theoretically, the hyperandrogenic phenotype might correlate with COVID-19 increased viral load, increased viral dissemination, and severity of lung involvement (Infographic 1).

Studies are still required for epidemiologic conclusions. Acknowledging the importance of androgens during the COVID-19 pandemic may offer another targeted therapy for trials, with androgen suppression to reduce host vulnerability when infection risk is high.

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 Funding sources: None.

Conflicts of interest: None disclosed.

IRB approval status: Not applicable.

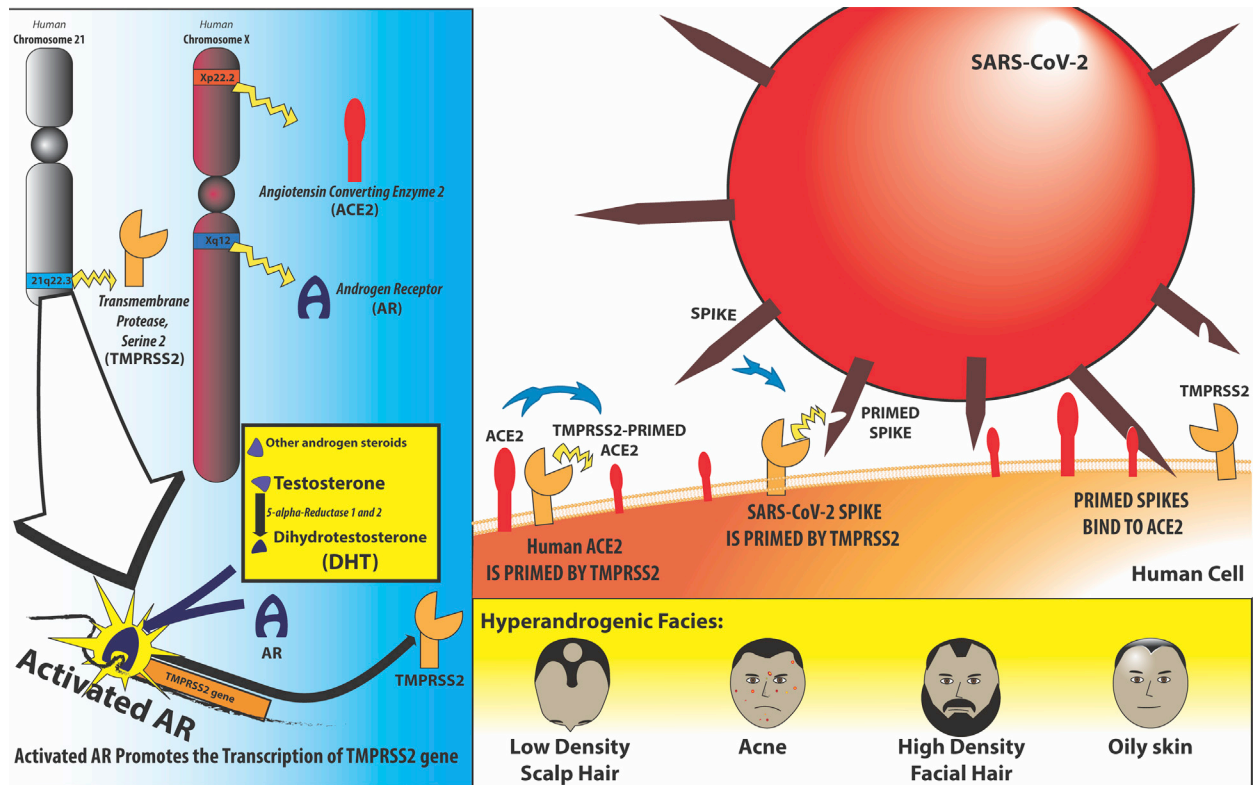
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J Am Acad Dermatol 2020;83:308-9.

0190-9622/\$36.00

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<https://doi.org/10.1016/j.jaad.2020.04.032>



Infographic 1. Androgen-mediated COVID-19.

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