Abstract Reviews

Sharing late-breaking advancements and key developments from abstracts presented by key experts in the field of dermatology at the European Academy of Dermatology and Venereology (EADV) Congress 2021.

Androgenetic Alopecia: Predictive Factor for COVID-19 Severity

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BACKGROUND

Since December 2019, the new severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) from Wuhan, China, has been the aetiological agent of COVID-19 disease, an infectious disease that has evolved into a global pandemic.[1] Androgenetic alopecia (AGA), the most common type of alopecia,[2] is an androgen-dependent condition, the main androgen responsible for the follicular pathology being dihydrotestosterone.[3]

MATERIALS AND METHODS

The authors reviewed nine articles studying the high rates of AGA in patients hospitalised with severe forms of COVID-19 that have been published in the last year. The multifaceted nature of this disease has been an incentive for many medical specialties to try to uncover its mechanisms, and dermatology is playing a part in this journey. The authors summarised the information they gathered on the topic and obtained the following results.

RESULTS

Recent studies suggest that males with AGA have a disproportionate risk relative to females

of developing severe, symptomatic forms of COVID-19 through an androgen-mediated vulnerability to SARS-CoV-2.[4-6] Sensitivity to androgen hormones is determined by genetic variants of the androgen receptor (AR). X-linked genetic polymorphisms that have been associated with androgenetic alopecia, benign prostatic hyperplasia, prostate cancer,[7] and polycystic ovary syndrome[8] may be responsible for an increase in host susceptibility, with AR being the only known promoter of transmembrane protease serine 2 (TMPRSS2). TMPRSS2 is an enzyme involved in SARS-CoV-2 infectivity by initiating the virus' spike protein, a key step in viral replication and cell–virus fusion.[5] In addition to theoretical molecular and epidemiological mechanisms, several studies have reported high rates of androgenetic alopecia in patients hospitalised with severe forms of COVID-19.[2,4-6,9,10]

CONCLUSION

The mechanism of regulation of TMPRSS2 by androgen hormones may explain the increased susceptibility of males to COVID-19. This pathophysiological process can also motivate the less symptomatic forms of children, given their reduced AR expression.[5] The investigation of the potential association between androgens and the severity of COVID-19 disease is justified in view of evaluating androgen suppression therapy as a potential treatment for COVID-19 infection. ■

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Histopathological Findings in COVID-19 Necrotic Lesions

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Keywords: COVID-19, histopathology, necrotic lesion, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), skin.

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BACKGROUND

One year after the identification of the novel severe acute respiratory syndrome 2 (SARS-CoV-2) infection in Wuhan, China, and the outbreak of the virus worldwide, the pandemic state persists, and the management of COVID-19 remains burdensome, with the number of people infected daily increasing progressively in most countries and the death rate being alarmingly elevated.[1] Since the elevated rate of infectivity of the virus, the authorisation of histological examination has been a harsh process, with high-risk of contagiousness even in qualified medical personnel.[2] However, thanks to the recently published histological reports, more about the pathogenic mechanism underlying viral-derived tissue damage has been understood. In this report, the authors describe a patient hospitalised for COVID-19 who developed necrotic acral lesions that were biopsied.

CASE REPORT

An 83-year-old female came to the emergency department because of acute respiratory distress, which required oxygen therapy. An oronasal swab was performed to identify SARS-CoV-2 RNA and the test resulted positive. Due to her rapidly deteriorating clinical condition, the patient was admitted to the infectious disease ward. Five days after her inpatient stay, she developed vesicular lesions on the lower

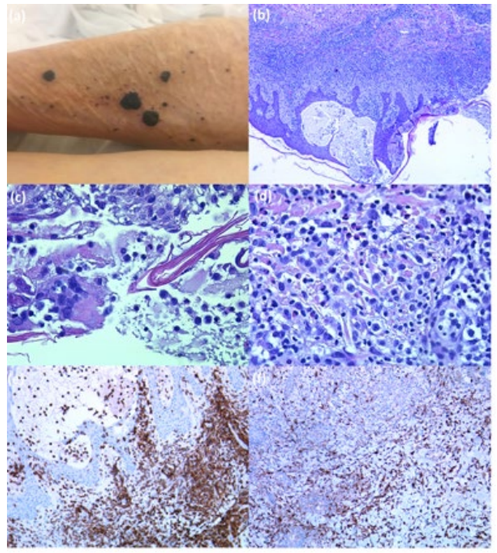

Figure 1: Gross and microscopy appearance of the necrotic lesions of a patient with COVID-19.

A) Multiple necrotic lesions on the lower limb of the patient. There are four main lesions and numerous other lesions with smaller diameters. **B)** Histological examination showing an intraepidermal vesicle and dense inflammatory infiltrate within the dermis (H&E 10x). **C)** Histology of the necrotic lesions. The lumen of the blister contains histiocytes and multinucleated giant cells (H&E 40x). **D)** Histology of the necrotic lesions. Many eosinophils associated with lymphocytes and histiocytes in the superficial dermis (H&E 40x). **E)** Numerous dermal and intraepidermal inflammatory cells are T lymphocytes as demonstrated with anti-CD3 rabbit monoclonal primary antibody 2GV6 (100x immunohistochemistry with haematoxylin counterstain using Ventana Ultraview DAB detection Kit in a Ventana BenchMark Ultra Processor® [Ventana Medical Systems, Tuscon, Arizona, USA). **F)** Histology of the necrotic lesions. The lymphocytes are mixed with numerous macrophages as demonstrated with anti-CD68 (KP-1) antibody (100x immunohistochemistry with haematoxylin counterstain using Ventana Ultraview DAB detection Kit in a Ventana BenchMark Ultra Processor®).
CD: cluster of differentiation; H&E: haematoxylin and eosin staining.