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DOI: 10.1111/jdv.17803

Non-invasive instrumental examinations of cutaneous, adnexal and mucosal manifestations after SARS-COV-2 infection in adult and children

Dear Editor,

On March 2020, COVID-19 has been declared as a pandemic emergency by World Health Organization (WHO). Initially, high attention was directed on life-threatening pulmonary and cardiovascular symptoms but soon the knowledge of the first cutaneous manifestations by Italian dermatologists opened a new vision on the disease.^{1,2}

The authors conducted an observational study with cross-sectional design from March 15th 2020 to October 10th 2020. All patients were positive for nasopharyngeal swab and/or SARS-CoV2 serology. Our cohort was stratified into two groups, a paediatric group of patients aged below 18 years and an adult group consisting of their parents. Data included demographic characteristics (age, sex, place of living), observed cutaneous lesions (urticaria, vasculitis, erythematous rash, perniosis), adnexal and mucosal involvement, specific symptoms related to COVID-19 onset, outcome and duration (including fever, diarrhoea, dyspnoea, cough, anosmia, ageusia, myalgia), inflammatory markers, comorbidities, use of supplemental oxygen therapy and COVID-19-directed treatments. Written informed consent was obtained from all the patients. Adnexal involvement was estimated by

dermoscopy and cutaneous ultrasonography (US). Comparison of proportions between subgroups of patients was carried out by Chi-squared test and Fisher's test when the first method could not be used due to the small number of cases.

Thirty-eight patients were enlisted by Pediatric Department and the outpatient Dermatologic Service.

Twenty-three patients were adults with age ranging from 35 to 72 years, eight patients (35%) were male and 15 (65%) female, 12/23 (52%) had no previous disease.

Eleven out of 23 adult patients (48%) had comorbidities: hypertension (7/11 64%), thyroid disease (3/11 27%), asthma (1/11 – 9%), fibromyalgia, celiac disease, dyslipidaemia, diabetes and renal insufficiency.

Fifteen children were recruited with age ranging from 4 to 17 years, seven patients (47%) were male and eight (53%) female, 13/15 (87%) had no previous disease.

One paediatric patient had asthma (7%) and another patient had celiac disease and allergy.

Cutaneous, adnexal and mucosal manifestations of SARS-COV-2 in adult and paediatric patients were respectively vasculitis (0/23 in adults vs. 5/15 – *P* value: 0.006), defluvium (12/23 vs. 1/15 – *P* value < 0.005), mucositis (7/23 vs. 1/15 – *P* value: 0.11), onychodystrophy (7/23 vs. 0/15 – *P* value: 0.0291), urticarial (1/23 vs. 0/15 – *P* value: 1), erythematous rash (2/23 vs. 0/15 – *P* value: 0.51), perniosis (0/23 vs. 0/15 – *P* value: 1).

Dermoscopic and capillaroscopic exams revealed microvascular abnormalities: (10/23 vs. 5/15 – *P* value: 0.74; Fig. 1); the trichoscopy showed miniaturization (11/23 vs. 3/15 – *P* value: 0.10;



Figure 1 Microvascular abnormalities of the nailfold capillaries, dermoscopic exam of the nail (10 \times).



Figure 2 Hair miniaturization, trichoscopy (10×).

Fig. 2) and cutaneous ultrasonography revealed altered vascularization of the nail matrix (10/23 adults and 8/15 paediatric patients – *P* value: 0.74).

Most common cutaneous manifestations in adults are generalized or localized maculopapular eruptions, urticaria, pseudochilblain and acro-ischaemic lesions, varicelliform rash, livedoid lesions, erythema multiforme-like vasculitis, herpes lesions, purpuric lesions, acute generalized exanthematous pustulosis-like rash and many others.³

Children present a milder course compared with adults being mostly asymptomatic or oligosymptomatic with rare cutaneous manifestations.^{4–6}

In paediatric group, acral ischaemic lesions represented a more frequent sign than in adult patients, whereas *telogen effluvium* was the most common feature among 23 adult patients.

Adnexal involvement like telogen effluvium (TE) has been associated to COVID-19 infection. In particular, SARS-CoV-2 determines a proinflammatory state activating the cytokine cascade involving IFN and IL-6. In particular, IL-6 dose-dependently inhibits hair follicles stem cells proliferation, functionally blocking the transition from telogen to anagen.⁷

In accordance with literature, in this study, only adult patients showed nail manifestations (onychodystrophy) compared with paediatric patients, who appeared about 2 months after diagnosis of Covid-19.⁸

Our study summarized the principal clinical characteristics of skin lesions, in post-COVID-19 infection period among adult and paediatric patients.

Acknowledgements

The patients in this manuscript have given written informed consent to publication of their case details.

Conflicts of interest

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Funding source

The authors report no involvement in the research by the sponsor that could have influenced the outcome of this work.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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DOI: 10.1111/jdv.17805