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LETTER

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Coronavirus disease 2019 and epidermolysis bullosa: Report of three cases

Dear Editor,

Recent demonstration of angiotensin I converting enzyme 2 (ACE2) and transmembrane protease, serine 2 (TMPRSS) expressions, both necessary for entry of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) into the host cells, in human epidermis suggests that skin might be a cellular host and a potential transmission route for the virus, especially in skin fragility conditions.[1] Epidermolysis bullosa (EB) is a skin fragility disorder caused by mutations in genes expressed in the cutaneous basement membrane zone.[2,3] While an international consensus panel recently provided recommendations for prevention and multidisciplinary care of EB patients during the coronavirus 2019 (COVID-19) pandemic,[4] the phenotypic outcome of these patients in comparison to the general patient population has not been reported; however, EB patients, particularly those with syndromic forms, may be at higher risk for infection with severe complications.[4,5] Here, we reported three EB patients infected by COVID-19 during this pandemic.

FAMILY 1

Two female siblings from a family with four EB patients were referred for COVID-19 (Figure 1A). The phenotype of the patients was compatible with severe generalized recessive dystrophic EB with a homozygous sequence variant in *COL7A1*: NM_000094.3: c.6091G>A, p.Gly2031Ser disclosed by Sanger sequencing (Figure 1B,D).[6] This family had a party attended by two children with common cold symptoms. After a week, these siblings experienced intermittent fever, dry cough, and myalgia with positive nasopharyngeal swab polymerase chain reaction test (PCR) test for SARS-CoV-2. The symptoms of the younger 32-year-old sister were mild; during subsequent 2 weeks of home quarantine, her general condition improved. However, the 35-year-old sister was hospitalized following exacerbation of symptoms including severe shortness of breath. The vital signs include temperature of 38.3°C, respiratory rate of 24/min, and oxygen saturation with oxygen mask of 92%. Low-dose spiral chest computed tomography (CT) revealed large areas of ground-glass opacities compatible with COVID-19 (Figure 1C). The patient was treated with a combination of lopinavir/ritonavir and hydroxychloroquine. Her symptoms resolved after 8 days of admission.

FAMILY 2

The third patient, affected by syndromic type of EB simplex with a homozygous donor splice site mutation in *CD151*: NM_004357.5: c.351+2T>C, was a 35-year-old male who experienced low-grade fever, pleuritic chest pain, myalgia, and dry cough (Figure 1E-G).[7] This mutation was disclosed by gene-targeted next-generation sequencing panel for EB.[8] He initially adhered to most recommendations of isolation; however, he worked as a construction worker and experienced mild signs of infection. A nasopharyngeal swab specimen for SARS-CoV-2 was positive. As his symptoms were mild, home quarantine was recommended. After 1 week, his symptoms were resolved without any specific treatment.

Patients with chronic diseases such as EB may face health issues during the COVID-19 pandemic.[9] It has been suggested that disrupted epidermal barrier may provide an entry route for SARS-CoV-2.[10] At the same time, compliance to the World Health Organization (WHO) hand hygiene protocols could be challenging for EB patients due to erosions on their hands. Recommendations for EB patients in the COVID-19 pandemic emphasize the use of mild hand cleansers that do not exacerbate the skin conditions along with frequent application of petrolatum-based emollients; the EB patients should also replace their outer layer of the dressings or bandages frequently. Importantly, their family members should follow all the precautions to avoid virus transmission to the patients.[4,5]

Our patients did not experience a severe course of COVID-19 despite some EB-related complications, including severe anemia, esophageal strictures, and growth retardation; in addition, one of the kidneys of the third patient was nonfunctional. Two patients experienced transient symptoms while in home quarantine, and the third one required hospitalization. Thus, the severity of the COVID-19 in these EB patients was in the spectrum experienced by the generalpatient population. However, further clinical studies are required to investigate the prevalence and course of COVID-19 in EB patients.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

Hassan Vahidnezhad initiated the study and wrote the draft of the paper. Leila Youssefian analyzed the genetic data. Fahimeh Abdollahimajd and Mohammad Reza Pourani provided clinical

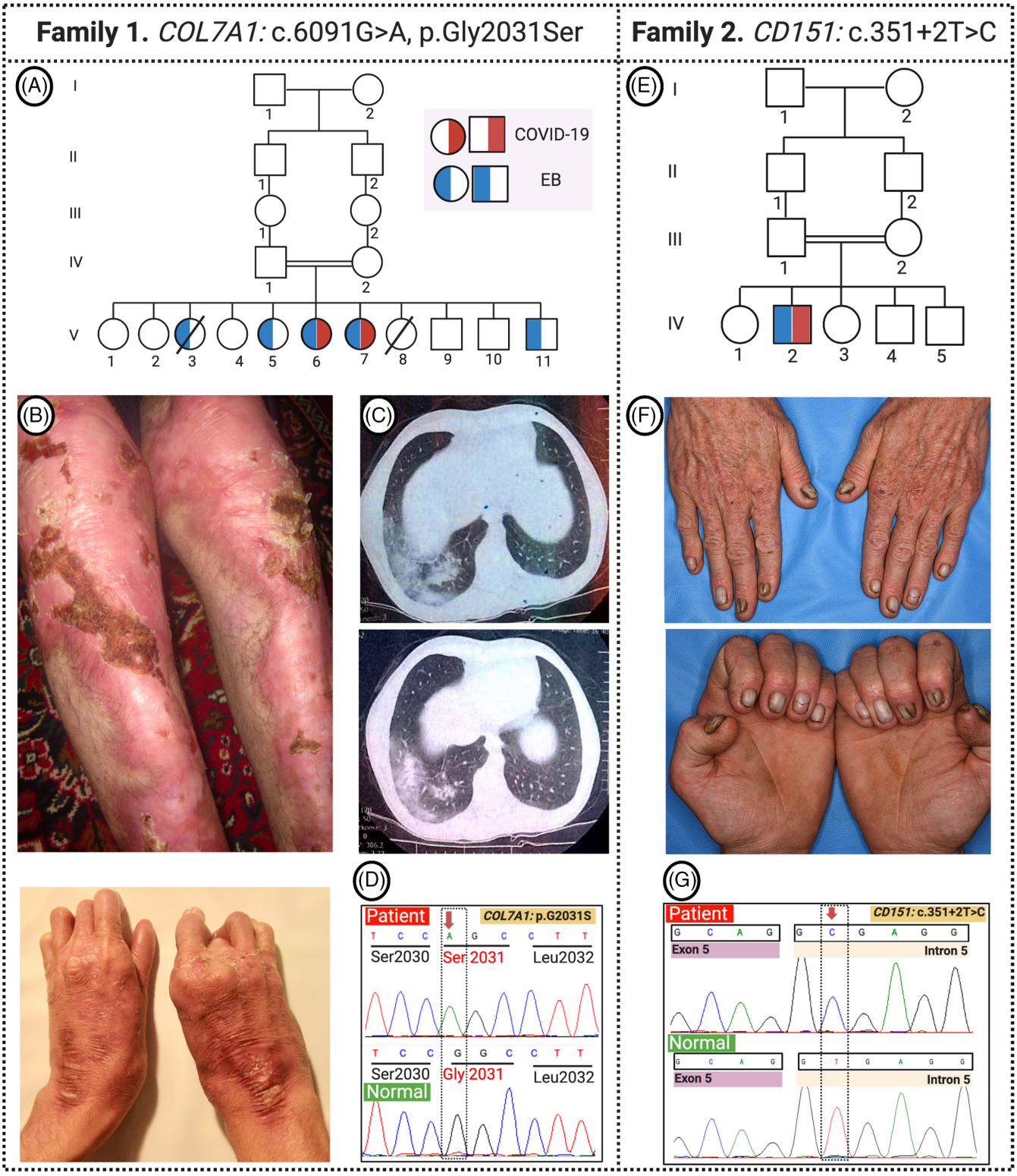

FIGURE 1 Clinical manifestations and genotyping of epidermolysis bullosa (EB) patients with a confirmed infection caused by coronavirus disease 2019 (COVID-19). A, The large consanguineous pedigree of recessive dystrophic EB (RDEB) patients with COVID-19 infection. B, The pathognomonic phenotype of RDEB patients, including erosions and scarring on feet and mitten deformities of the hands. C, A representative image of large areas of ground-glass opacities with reticular and interlobular septal thickening related to V-6. D, Sanger sequencing of polymerase chain reaction (PCR)-amplified exon 73 of *COL7A1* disclosed homozygous variant of p.Gly2031Ser. E, The consanguineous pedigree of an EB patient with *CD151* mutation. F, Clinical presentations include acrogeria and erosions on the dorsal aspect of hands and nail dystrophy. G, Sanger sequencing confirmed the homozygous canonical splicing variant of *CD151*:c.351+2T>C mutation detected by next-generation sequencing

information. Jouni Uitto supervised the project and completed the manuscript. All authors have read and approved the final version for publication.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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