LETTER TO THE EDITOR

Late-onset pustular skin eruption in a healthy neonate born from COVID-positive mother: a coincidence or a new skin sign of the infection?

Dear Editor,

We recently came across a male newborn with a diffuse pustular eruption of the trunk and the face appeared on 25th day of life. The baby was born from asymptomatic COVID-19-positive mother and was otherwise healthy. Patient's throat swab PCR diagnostic test for SARS-CoV-2 was negative. A detailed clinical examination revealed monomorphic small pustules predominantly affecting the upper part of the chest and to a minor extent the face (Fig. 1a–b). The lesions quickly self-improved within 1 week leaving a network-like hyperpigmentation and fine desquamation (Fig. 2). Unfortunately, because of fast and spontaneous improvement of the lesions, bacterial and fungal cultures were not obtained from skin lesions. On the basis of the history, cutaneous manifestations, and evolution of the lesion, it was hypothesized a late-onset pustular skin eruption secondary to mother's SARS-CoV-2 infection.

In recent months, an increasing interest has grown among researchers about cutaneous manifestations of COVID, in particular towards a novel finding, namely chilblain-like lesions.[1–5]

To date, skin of neonates born from COVID-positive mother (from now on COVID babies) has been poorly investigated. In particular, 2 cases of cutaneous findings early appearing during

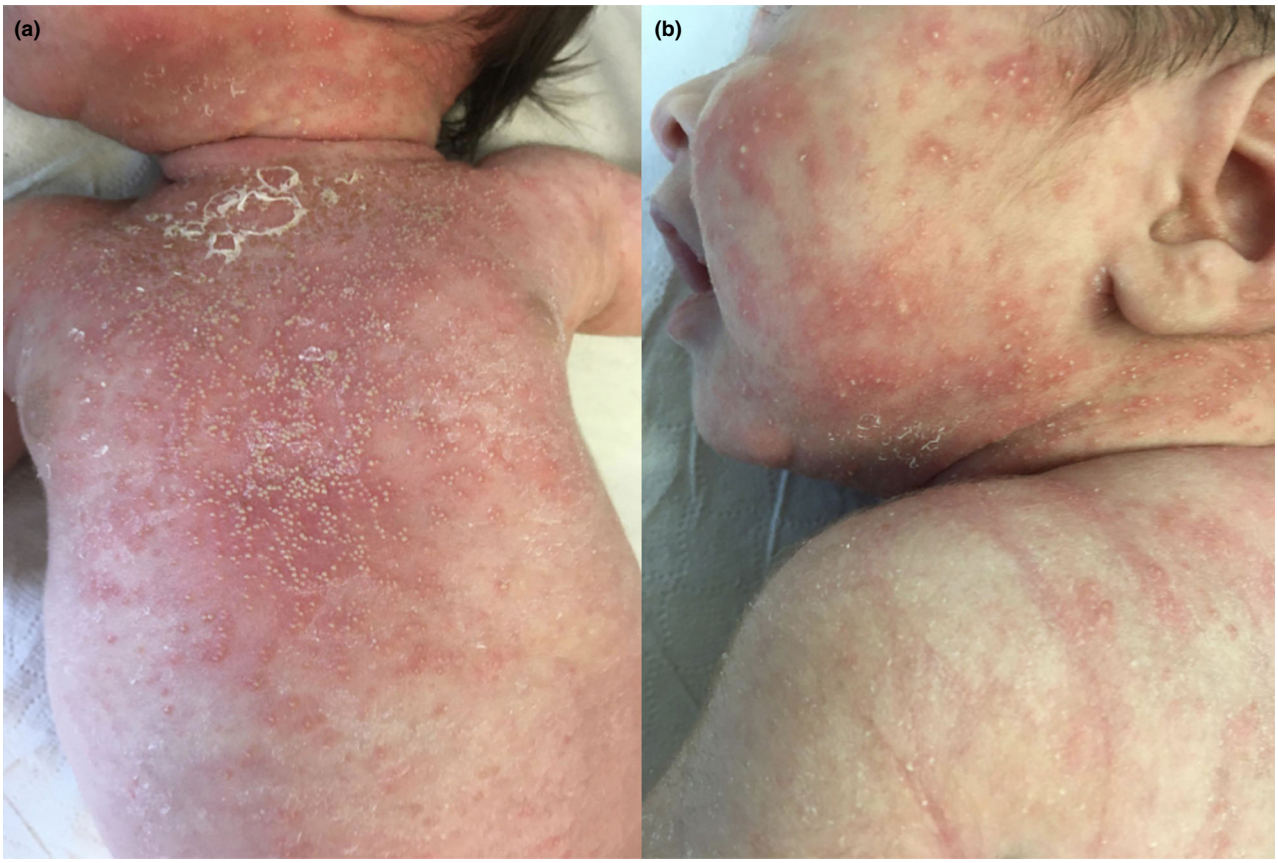

Figure 1 (a) Diffuse pustules of the chest; (b) A detailed view of lesions located on head/neck region.

Figure 2 Spontaneous evolution with scaling and pigmentation one week after the appearance of pustular eruption.

the first day of life in COVID babies were reported by the same authors[6]; one patient presented with a diffuse maculopapular rash associated with ulceration of the forehead, while the second patient showed diffuse small miliary red papules of the forehead. In both patients, skin findings disappeared within a few days without treatment.

Moreover, a case of orange discoloration of the skin of mother and newborn with SARS-CoV-2 infection has been recently reported.[7]

Pustular eruptions of the newborn could be challenging for their similarities in clinical presentation and the large variety of possible differential diagnoses, including among the most seen: (a) infectious diseases, such as candidiasis, bacterial infections and scabies; (b) non-infectious conditions, such as erythema toxicum neonatorum (ETN), transient neonatal pustular melanosis (TNPM), pustular miliaria and neonatal cephalic pustulosis (NCP).[8]

In our patient, infectious aetiology was excludable since neonatal candidiasis is usually present at birth (except for non-congenital candidiasis, moreover with a different presentation), while bacterial infections tend to merge into larger pustules or evolve into blisters and are not self-healing. Among non-infectious conditions, ETN was excluded on a timing basis (it usually appears within the first week of life); despite similarities in residual pigmentation, that is usually less evident in TNPM, the absence of epidermal collarette and above all the late onset excluded this diagnosis; miliaria is caused by obstruction or inflammation of eccrine sweat ducts and it's commonly seen in newborns in the forms of miliaria rubra or miliaria crystalline, whereas it can be rarely observed the deeper pustular form mostly at dorsum, showing few similarities with our patient's rash, presenting with most lesions on the chest; finally, NCP usually presents with a predominant eruption on the face, (not consistent with our patient's presentation), tends to be longer in duration and does not resolve with secondary desquamation.

Given none of the diseases listed in the differential diagnoses thoroughly fits the characteristics of our patient, the hypothesis of a late-onset pustular skin eruption secondary to mother's SARS-CoV-2 infection could be reasonably advanced.

A possible explanation of this eruption could be a transient change of cutaneous microbiome in the newborn exposed to SARS-CoV-2, leading to a pustular eruption quite similar to NCP.[9] Another interesting observation was transitory fetal skin oedema demonstrated by ultrasound in a pregnant woman with COVID, which could explain the 'toxic' effect of the infection on the skin of the newborn and the secondary desquamation.[10]

It is worth noting the description of this patient, as no previous cases of similar eruptions were reported in COVID babies and invite researchers to observe with high attention this group of patients. Further investigations are desirable to understand whether this finding is casual or could have a direct relationship with exposure of SARS-CoV-2 in utero.

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Conflict of interest

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