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Archives de pédiatrie 28 (2021) 573–575

Available online at ScienceDirect www.sciencedirect.com

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Short communication

SARS-CoV-2-associated Henoch–Schönlein purpura in a 13-year-old girl

Charlotte Borocco[a,*], Céline Lafay[a], Inès Plantard[b], Jeremy Gottlieb[c], Isabelle Koné-Paut[a], Caroline Galeotti[a,b]

[a] *Pediatric Rheumatology, centre de référence des maladies autoinflammatoires et de l'amylose inflammatoire, CEREMAIA, Assistance Publique-Hôpitaux de Paris, Université Paris-Sud, Bicêtre Hospital, 78 rue du General Leclerc, 94275 Le Kremlin-Bicêtre cedex, France*

[b] *Pediatric Emergency Care, Assistance Publique-Hôpitaux de Paris, Université Paris-Sud, Bicêtre Hospital, 78 rue du General Leclerc, 94275 Le Kremlin-Bicêtre cedex, France*

[c] *Department of Dermatology, Assistance Publique-Hôpitaux de Paris, Université Paris-Sud, Bicêtre Hospital, 78 rue du General Leclerc, 94275 Le Kremlin-Bicêtre cedex, France*

ARTICLE INFO

Article History:
Received 10 July 2020
Revised 19 April 2021
Accepted 13 June 2021
Available online 9 July 2021

Edited by: B. Chabrol

Keywords:
Henoch–Schönlein purpura
SARS-CoV-2
Epstein–Barr virus
Children
Vasculitis

ABSTRACT

In the context of the current coronavirus disease 2019 (COVID-19) pandemic, cutaneous lesions are being described. Here, we report on a 13-year-old girl with SARS-CoV-2-associated Henoch–Schönlein purpura and Epstein–Barr virus (EBV) infection. She presented without any respiratory symptoms, only a purpuric skin rash, abdominal pain, low-grade fever, and pharyngitis. Virology tests by polymerase chain reaction (PCR) were positive for SARS-CoV-2 and EBV. The potential association of Henoch–Schönlein purpura and SARS-CoV-2 should be kept in mind in order to reduce the spread of the virus, particularly in children with few respiratory symptoms.

1. Introduction

Patients affected by coronavirus disease 2019 (COVID-19) most often present with respiratory signs. Pediatric patients appear to be less symptomatic with 4.4–21% reported as asymptomatic [1]. The cutaneous signs associated with COVID-19 have been increasingly described, with numerous presentations of vascular lesions. We present the case of a 13-year-old patient with Henoch–Schönlein purpura (HSP), who was infected with both SARS-CoV-2 and Epstein–Barr virus (EBV).

2. Case report

The patient was admitted in April 2020 to a pediatric emergency unit of the Paris region (France), for purpura and abdominal pain. She had a medical history of panhypopituitarism secondary to a suprasellar germinoma treated by surgery, chemotherapy, and radiotherapy in 2012. She was in remission in January 2013 and had a 7.5-year follow-up. Her substitutive treatment included thyroid and growth hormones, desmopressin, and hydrocortisone. The patient had no other condition, neither Raynaud syndrome nor alopecia. Her family was from Maghreb and there was no pertinent family history reported. She presented initially with infiltrated purpuric and ecchymosis lesions on her lower limbs and buttocks, as well as an ankle edema (Fig. 1A–C), which lasted for 13 days. Secondarily, she had a transient low-grade fever and intense abdominal pain, for which she was referred to the pediatric emergency care. She had no family contact with COVID-19 or EBV infection or any other contact with COVID-19 (French lockdown). Physical examination showed the aforementioned rash, a mild epigastric pain, and a sore throat without fever or cough. She had no splenomegaly and no palpable lymph nodes. Her blood pressure was normal.

Rapid test results for group A streptococcus were negative. An abdominal ultrasound showed infracentimetric mesenteric lymphadenopathies. Neither proteinuria nor hematuria was detected on the urinalysis. A complete blood count revealed leukocytosis of 15.24×10^9/L with neutrophilia (9.49×10^9/L) and moderate lymphocytosis (4.57×10^9/L) without activated lymphocytes; the hemoglobin level was 15.4 g/dL and platelet count was 313×10^9/L. The C-reactive protein levels was 84 mg/L. Hepatic and renal function test results were normal. Prothrombin time (PT) was 71% (normal range >70%) and kaolin cephalin clotting time was 1.06 (normal < 1.15). The serum immunoglobulin (Ig) profile was: IgG 13.6 g/L (normal range = 6.55–12.6); IgM 1.24 g/L (normal range = 0.65–1.85); and IgA 2.64 g/L (normal range = 0.52–1.68). Antinuclear antibodies

* Corresponding author.
E-mail address: charlotte.borocco@aphp.fr (C. Borocco).

https://doi.org/10.1016/j.arcped.2021.06.004
0929-693X/

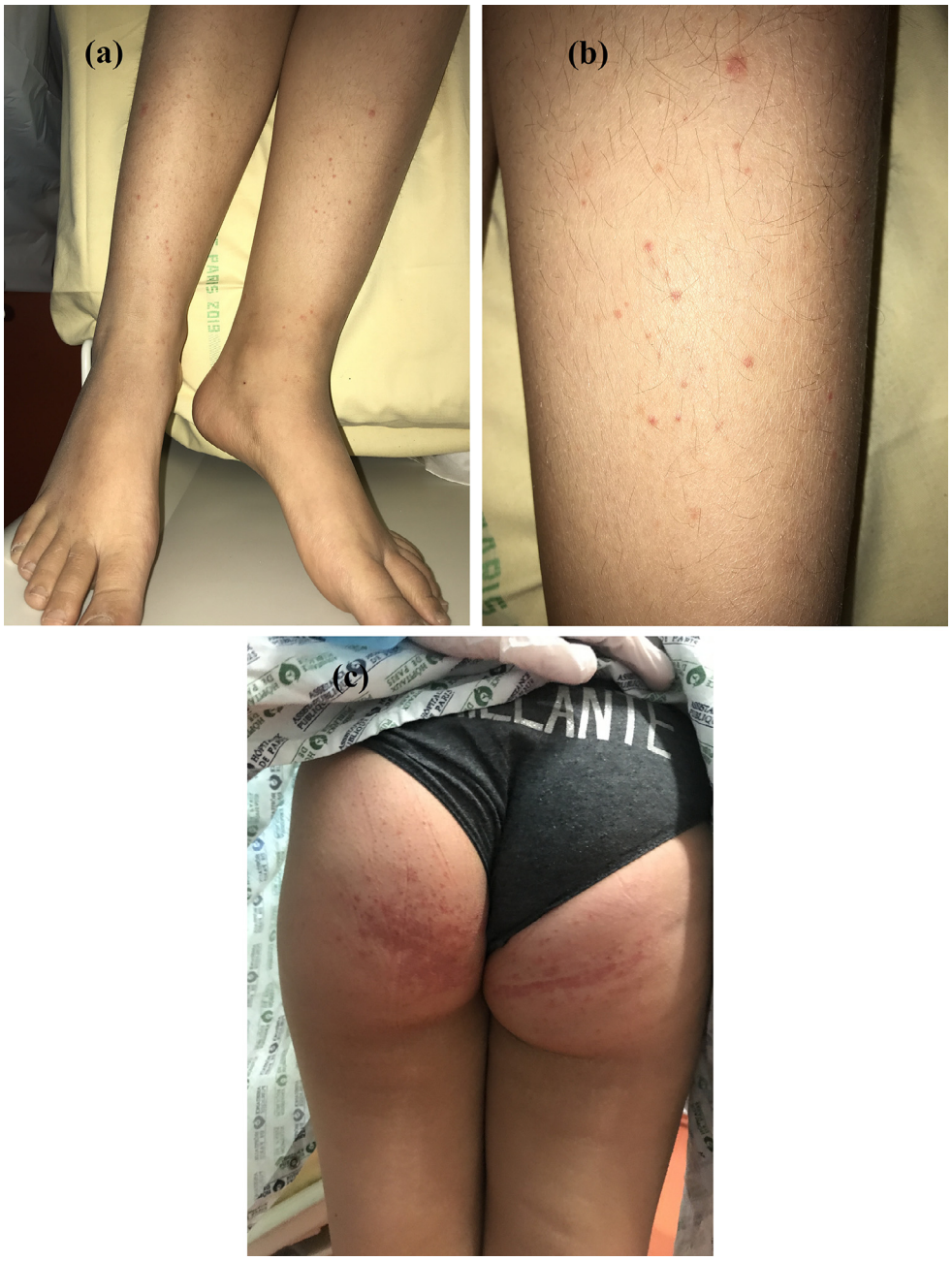

Fig. 1. A, B, C: Purpuric lesions of the lower limbs and buttocks in a 13-year-old girl lasting 13 days.

(ANA) were absent. Reverse transcription polymerase chain reaction (RT-PCR) assay for SARS-CoV-2 was performed on a nasopharyngeal swab and was positive as was a blood PCR assay for EBV (15,900 copies/mL). Blood culture was negative.

We concluded on a case of EBV and SARS-CoV-2-induced HSP. The status of EBV primary infection or reactivation remained unknown in the absence of an EBV serology test. Finally, her clinical evolution was favorable and she was discharged after 24-h hospitalization. She received exclusively pain relievers. She had no complications from COVID-19 or HSP at follow-up and did not present with HSP nephritis at the 1-year follow-up in April 2021.

3. Discussion

Here, we report on a patient with HSP associated with EBV infection and SARS-CoV-2. Purpuric lesions are particularly common in children, very often in the context of HSP. Indeed HSP, small-vessel immunoglobulin A (IgA) vasculitis, is the most frequent vasculitis in children. According to the EULAR/PRINTO/PRES criteria, diagnosis is based on the presence of purpura of the lower extremities and on one of four criteria: abdominal pain; histopathology (IgA); arthritis or arthralgia; and renal involvement. We considered the diagnosis of HSP in this patient because the diagnostic criteria were met, even if the age was not typical. Indeed, she had typical vasculitis with palpable rash over typically involved areas, periarticular edema, arthralgia, and abdominal pain. We could not obtain histopathologic confirmation because her rash did not contain new active lesions. She did not present with enough other clinical or laboratory biological signs to consider a systemic pathology or another vasculitis. Nevertheless, laboratory tests were repeated during her follow-up to ensure this.

Although the pathophysiology of IgA vasculitis remains not very well-known, many authors suggest the presence of an infectious

agent triggering this pathology in patients. In children, studies have found a link between HSP and infections with streptococcus, *Helicobacter pylori*, mycoplasma [2] or respiratory syncytial virus, influenza. and norovirus [3]. A few rare cases of HSP associated with EBV have been described in the literature but still remain uncommon [4–6]. The association between HSP and SARS-CoV-2 in this patient therefore seems noteworthy even if a double infectious trigger can be retained.

In adult patients, cases of endotheliitis caused directly by SARS-CoV-2 are now being described [7]. Autopsy reports of deceased patients diagnosed with COVID-19 found viral particles and an accumulation of inflammatory cells and apoptosis cells in the endothelium of multiple organs. Small vessels of glomerular capillary loops, submucosal vessels of the small intestine, small vessels of the lung and heart, and lymphocytic vessels in the lung, heart, kidney, and liver were predominantly affected. We can therefore speculate on a direct pathogenic attack of the virus on the small vessels in the whole body. Several skin biopsies carried out in different studies also show lesions of vasculitis and microthrombi [8].

It is known that SARS-CoV-2 uses angiotensin-converting enzyme 2 (ACE2) to infect its host, facilitating virus entry and replication [9]. ACE2 is present in many organs such as the lungs, heart, on enterocytes of the small intestine, or in the arterial and venous endothelial cells and is currently a potential target for the development of therapeutics against COVID-19 [9]. Recombinant human ACE2 is also studied as a potential target therapy in HSP, decreasing damage to endothelial cells [10]. Thus, SARS-CoV-2 could, via ACE2, induce HSP-like lesions of cutaneous and digestive vasculitis.

4. Conclusion

Faced with a pandemic that continues to spread, particularly in pediatric populations with few symptoms, we herewith draw the attention of pediatricians about possible cases of HSP associated with COVID-19 and urge them to increase their vigilance with regard to these patients. COVID-19 may be revealed by vascular skin manifestations such as HSP. Pediatricians should be vigilant for this type of skin involvement in order to reduce the spread of the virus.

Declaration of Competing Interest

The authors have no conflicts of interest relevant to this article to disclose.

Funding source

The project was carried out without any specific support.

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