

# A child with Henoch-Schonlein purpura secondary to a COVID-19 infection

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## SUMMARY

Henoch-Schonlein purpura (HSP) is a common IgA-mediated small vessel vasculitis of childhood that affects several systems. It is characterised by a tetrad of dermatological, abdominal, joint and renal manifestations. HSP can occur secondary to upper respiratory tract infections, medications, vaccinations and malignancies. COVID-19 is caused by SARS-CoV-2, a single-stranded RNA virus from the Beta-Coronaviridae family, and often presents as a respiratory infection with symptoms ranging from a mild common cold-like illness to severe pneumonia. It has also been reported to exhibit extrapulmonary manifestations, including but not limited to cardiac, thrombotic, hepatocellular and dermatological complications. We report a case of a 4-year-old boy who presented with clinical features of HSP, with detailed history that revealed a recent recovery from a COVID-19 upper respiratory tract infection, indicating a possible correlation between the two.

## BACKGROUND

Henoch-Schonlein purpura (HSP) is a common small vessel vasculitis of childhood.<sup>1-3</sup> It is an IgA-mediated, self-limiting disease that involves multiple organs.<sup>1-3</sup> The diagnosis of HSP is made clinically based on the revised criteria developed by the European League Against Rheumatism, the Paediatric Rheumatology International Trials Organization and the Paediatric Rheumatology European Society (EULAR/PRINTO/PRES) in 2010, which consists of mandatory and supportive criteria.<sup>3</sup> The mandatory criterion includes palpable purpura in the absence of thrombocytopenia, while the supportive criteria involve at least one or more of the following: acute-onset diffuse abdominal pain, acute-onset arthralgia or arthritis, renal involvement in the form of proteinuria or haematuria, and histopathological evidence of leucocytoclastic vasculitis or proliferative glomerulonephritis with predominant IgA deposits.<sup>3</sup>

To this day, the exact aetiology of HSP remains unknown. It is however thought to be preceded by upper respiratory tract infections (commonly caused by streptococcal species, parainfluenza virus and human parvovirus B19), medications, vaccinations or malignancies.<sup>3</sup>

SARS-CoV-2 is a single-stranded RNA virus responsible for COVID-19.<sup>4,5</sup> It often targets the respiratory system, with presentations ranging from a mild common cold-like illness to severe and potentially fatal conditions secondary to pneumonia, such as acute respiratory distress syndrome or septic shock.<sup>5</sup> COVID-19 can also result in

extrapulmonary manifestations, including but not limited to cardiac, thrombotic and dermatological complications.<sup>6,7</sup>

The aim of this case publication is to report a possible association between a preceding COVID-19 infection and a first onset of HSP in a previously well child.

## CASE PRESENTATION

A 4-year-old boy presented accompanied by his father with a 1-day history of rash in his lower limbs. He had an acute onset of pruritic, non-blanching, maculopapular rash of varying sizes distributed all over his lower limbs bilaterally, extending from the soles up to the knees. The rash was also present in minimal amounts in his buttocks. It was associated with mild oedema in the ankles associated with ankle pain, resulting in difficulty in weight-bearing and leading to limping with walking. The father reported that the child was not complaining of fever, abdominal pain, diarrhoea or haematuria and that this was the first occurrence of such episode. The patient had recently recovered from an upper respiratory tract infection caused by COVID-19, exactly 37 days prior to presenting with his skin lesions. He was confirmed to be positive for COVID-19 by a PCR test done on two separate occasions 5 days apart. The test was done in view of the child having fever and influenza-like symptoms which lasted for 1 week. The child did not require hospital admission for treatment. His medical history was otherwise unremarkable.

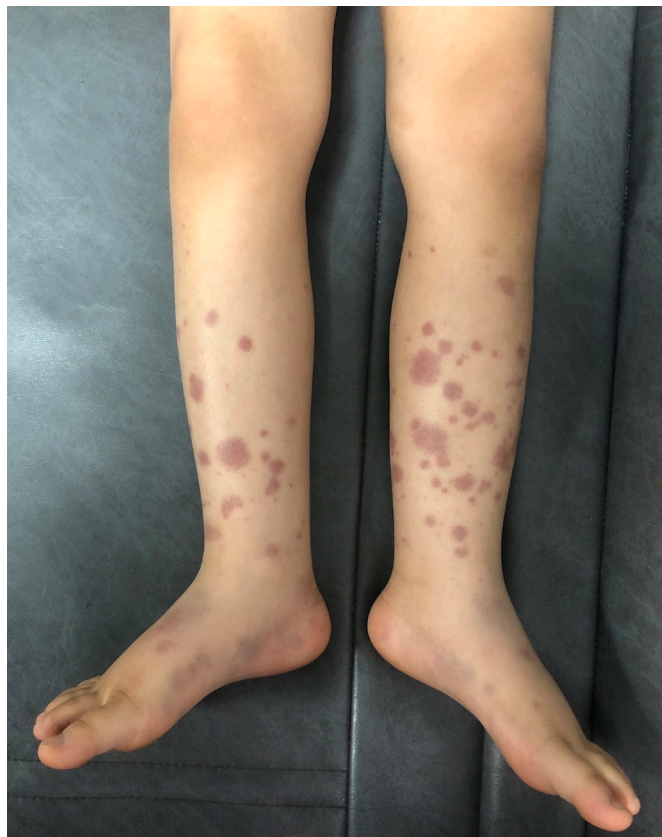
The patient was alert and conscious, but irritable. He was well hydrated and showed no signs of respiratory distress or jaundice. His vital signs were as follows: temperature of 36.9°C (measured axillary), heart rate of 98 beats per minute, respiratory rate of 22 breaths per minute, blood pressure of 102/56 mm Hg and oxygen saturation of 98% on room air.

Lower limb examination showed diffuse, non-blanching, maculopapular rash in both lower limbs, extending from the soles up to the knees, and also minimally involving the buttocks (figure 1). Non-pitting oedema was present in the ankles bilaterally. Examination of the ankle joints revealed absence of erythema; however, restricted active movements were noted. Passive movement of the joint, along with gait, could not be assessed due to reluctance of the patient. No enlargement of lymph nodes was noted. Cardiovascular examination was unremarkable, with normal S1 and S2 sounds heard, with no added sounds or murmurs. Chest examination was clear with equal bilateral air entry and no added sounds. The abdomen was soft and lax,



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**Figure 1** The patient's lower limb rash characteristic of Henoch-Schonlein purpura.

without tenderness or organomegaly. Neurological examination was unremarkable, with intact cranial nerves, motor and sensory examination, and absent neurocutaneous lesions.

### INVESTIGATIONS

Laboratory investigations revealed normal full blood count, normal electrolytes, normal liver and renal function tests, as well as normal coagulation profile, erythrocyte sedimentation rate and C reactive protein values. An anti-streptolysin-O (ASLO) titre was also normal, as were the anti-nuclear antibody, anti-double stranded DNA antibody, and serum IgA, IgG and IgM. Urine dipstick was unremarkable, as was the urine analysis which showed a white cell count (WCC) of  $0-5 \times 10^9/L$  and red blood cell (RBC) count of  $0-2 \times 10^{12}/L$ . Urine culture report showed no evidence of growth.

### DIFFERENTIAL DIAGNOSIS

The patient's acute presentation of lower limb arthralgia and maculopapular rash highlighted several differential diagnoses, all of which have been ruled out by either the previously mentioned investigations or failure to fulfil the diagnostic criteria set for such diseases. These differential diagnoses included a group A beta-haemolytic streptococcal infection, thrombotic thrombocytopenic purpura (TTP), systemic lupus erythematosus (SLE), juvenile idiopathic arthritis (JIA), Kawasaki disease, multisystem inflammatory syndrome in children (MIS-C) and non-accidental injury.

A group A beta-haemolytic streptococcal infection was ruled out by the negative ASLO titre, TTP was ruled out by the normal platelet level, SLE was ruled out by a negative ANA and anti-dsDNA antibody screen, as well as not fulfilling the diagnostic

criteria, while JIA, Kawasaki disease and MIS-C were ruled out due to failure to fulfil the diagnostic criteria.

To diagnose SLE, 4 out of the 11 American College of Rheumatology (ACR) criteria should be met.<sup>8</sup> Our patient, however, met only one (arthrititis). As for JIA, the ACR criteria states that arthrititis should be present for a minimum duration of 6 weeks.<sup>9</sup> Our patient, on the other hand, only presented with arthralgia of 1-day duration. To diagnose Kawasaki disease, fever must be present for at least 5 days, along with four out of five other criteria.<sup>10</sup> In addition, to diagnose MIS-C, in both the Centers for Disease Control and Prevention and WHO criteria, fever must be present, along with a number of other criteria that have to be met.<sup>11</sup> Our patient, however, did not present with fever nor did he exhibit any multisystemic involvement; therefore, both Kawasaki disease and MIS-C were ruled out. Non-accidental injury was also ruled out as the child's skin lesions were purpuric in nature, distributed along both lower limbs and the buttocks, which are typical sites of HSP lesions, with no signs of bruises, scalds or lacerations in his body.

The patient's clinical presentation fit the EULAR/PRINTO/PRES criteria for HSP as it fulfilled the mandatory criterion, characteristic rash in the absence of thrombocytopenia, and one of the supportive criteria, acute arthralgia of the ankle joints. The patient was therefore clinically diagnosed with HSP.

### TREATMENT

The patient was treated symptomatically with pro re nata (PRN) paracetamol for joint pain and was discharged the following day as he had remained pain-free and was able to weight-bear. He was given a follow-up appointment in the outpatient clinic after 1 week with repeat urinalysis.

### OUTCOME AND FOLLOW-UP

At 1-week follow-up in the clinic, the rash was still present bilaterally in the lower limbs, but otherwise the patient had no other complaints. His urine dipstick revealed trace blood, but urinalysis was unremarkable as the WCC was still  $0-5$  and RBC  $0-2$ . He was given another appointment in the clinic after 2 months for follow up of his urinalysis and renal function tests.

### DISCUSSION

Our patient had the clinical signs and symptoms of HSP, fulfilling the EULAR/PRINTO/PRES criteria as he had both the mandatory criterion, palpable purpura in the absence of thrombocytopenia, and one of the supporting criteria, arthralgia of acute onset.

The most common triggering factor for HSP is a preceding upper respiratory tract infection. The most common cause of such is a streptococcal infection, followed by viral infections secondary to parainfluenza virus or human parvovirus B19.<sup>12</sup> Looking at both the history and laboratory investigations of this patient, having had no prior infection with the previously mentioned causative organisms, but a prior upper respiratory tract infection with COVID-19, it only suggests that COVID-19 could possibly be an HSP-triggering virus.

The only occurrence of HSP in a person with a COVID-19 infection, to our knowledge, was reported in a 78-year-old man who presented with cutaneous vasculitis, arthritis and nephritic syndrome following COVID-19 pneumonia. A kidney biopsy revealed the presence of an IgA vasculitis, thus confirming the diagnosis.<sup>12</sup>

Moreover, a review by AbdelMassih *et al*<sup>13</sup> reported a link between COVID-19 and another childhood vasculitis, Kawasaki

disease. Another case report by Chesser *et al* also reported a link between COVID-19 and acute haemorrhagic oedema of infancy in an 8-month-old girl.<sup>14</sup> In both cases, it appears that there is a causal relationship between COVID-19 and postinfectious vasculitis.

Although more research is needed to determine the role of SARS-CoV-2 in the pathogenesis of IgA-mediated vasculitis, HSP's frequent association with respiratory viruses and the recent COVID-19 upper respiratory tract infection in our patient and the COVID-19 pneumonia in Suso *et al*'s<sup>12</sup> patient suggest that there may be a link between the two.

### Learning points

- ▶ An association between the novel coronavirus SARS-CoV-2 and childhood vasculitis Henoch-Schönlein purpura is reported.
- ▶ An upper respiratory tract infection by SARS-CoV-2 could be a triggering factor in the emergence of Henoch-Schönlein purpura.
- ▶ Ruling out a prior infection with SARS-CoV-2 in paediatric patients presenting with what clinically appears as Henoch-Schönlein purpura should be considered.

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### REFERENCES

- 1 Sohagia AB, Gunturu SG, Tong TR, *et al*. Henoch-Schönlein purpura—a case report and review of the literature. *Gastroenterol Res Pract* 2010;2010:1–7. doi:10.1155/2010/597648
- 2 Lim DCE, Cheng LNC, Wong FWS. Could it be Henoch-Schönlein purpura? *Aust Fam Physician* 2009;38:321–4.
- 3 Hetland LE, Susrud KS, Lindahl KH, *et al*. Henoch-Schönlein purpura: a literature review. *Acta Derm Venereol* 2017;97:1160–6.
- 4 Douedi S, Miskoff J. Novel coronavirus 2019 (COVID-19). *Medicine* 2020;99:e20207.
- 5 Beeching N, Fletcher T, Fowler R. Coronavirus disease 2019 (COVID-19) - Symptoms, diagnosis and treatment | BMJ Best Practice US [Internet], 2020. Available: <https://bestpractice.bmj.com/topics/en-us/3000168>
- 6 Feldman S, Freeman E. Coronavirus disease 2019 (COVID-19): Cutaneous manifestations and issues related to dermatologic care [Internet]. Uptodate.com, 2020. Available: <https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19-cutaneous-manifestations-and-issues-related-to-dermatologic-care/print>
- 7 Gupta A, Madhavan MV, Sehgal K, *et al*. Extrapulmonary manifestations of COVID-19. *Nat Med* 2020;26:1017–32.
- 8 Levy D. Childhood-onset systemic lupus erythematosus (SLE): Clinical manifestations and diagnosis [Internet]. Uptodate.com, 2020. Available: <https://www.uptodate.com/contents/childhood-onset-systemic-lupus-erythematosus-sle-clinical-manifestations-and-diagnosis#H75107738>
- 9 Kimura Y. Systemic juvenile idiopathic arthritis: Clinical manifestations and diagnosis [Internet]. Uptodate.com, 2020. Available: <https://www.uptodate.com/contents/systemic-juvenile-idiopathic-arthritis-clinical-manifestations-and-diagnosis#H8>
- 10 Sundel R. Kawasaki disease: Clinical features and diagnosis [Internet]. Uptodate.com, 2020. Available: <https://www.uptodate.com/contents/kawasaki-disease-clinical-features-and-diagnosis#H3449497313>
- 11 Uptodate.com. CDC and WHO case definitions of multisystem inflammatory syndrome in children [Internet], 2020. Available: [https://www.uptodate.com/contents/image?imageKey=PEDS%2F128201&topicKey=ID%2F127454&source=see\\_link](https://www.uptodate.com/contents/image?imageKey=PEDS%2F128201&topicKey=ID%2F127454&source=see_link)
- 12 Suso AS, Mon C, Oñate Alonso I, *et al*. IgA vasculitis with nephritis (Henoch-Schönlein purpura) in a COVID-19 patient. *Kidney Int Rep* 2020;5:2074–8.
- 13 *et al* AbdelMassih A, AbdelAzeam A, Ayad A. Unleashing the mysterious link between COVID-19 and a famous childhood vasculitis: Kawasaki disease. *Egyptian Pediatric Association Gazette* [Internet], 2020. Available: [https://www.researchgate.net/publication/342918969\\_Unleashing\\_the\\_mysterious\\_link\\_between\\_COVID-19\\_and\\_a\\_famous\\_childhood\\_vasculitis\\_Kawasaki\\_disease](https://www.researchgate.net/publication/342918969_Unleashing_the_mysterious_link_between_COVID-19_and_a_famous_childhood_vasculitis_Kawasaki_disease)
- 14 Chesser H, Chambliss JM, Zwemer E. Acute hemorrhagic edema of infancy after coronavirus infection with recurrent rash. *Case Rep Pediatr* 2017;2017:1–3.

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