Case study

Rheumatoid purpura post covid in children: a case report

ABSTRACT

Rheumatoid purpura (RP), also called Henoch-Schonlein purpura (HSP), is a common IgA-mediated small-vessel vasculitis of childhood that affects multiple systems. It is characterized by a tetrad ofmanifestations, dermatological, abdominal, articular and renal. HSP can occur as a result of upper respiratory tract infections, medications, vaccinations, and malignancies. We report the case of a 28-month-old boy who presented with clinical features of HSP, with positive COVID-19 serology without any other triggering factor of HSP, indicating a possible correlation between the two. The patient was treated with oral prednisolone with rapid clinical improvement. Our report confirms the association between the coronavirus SARS-CoV-2 and infantile HSP that has been reported in literature.

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Keywords:COVID-19;Henoch-SchonleinPurpura;Pediatric

BACKGROUND

Henoch-Schonlein purpura (HSP) is a vasculitis of the small vessels of childhood[1–2]. It is an IgA-mediated disease that involves multiple organs[3]. The diagnosis of HSP is made clinically. Mandatory criteria include palpable purpura in the absence of thrombocytopenia, while supportive criteria involve at least one or more of the following: diffuse abdominal pain of acute onset, arthralgia or arthritis of acute onset, renal involvement in the form proteinuria or hematuria, and histopathological signs of vasculitis or leukocytoclastic proliferation, active glomerulonephritis with predominant IgA deposits[3].

To date, the exact etiology of HSP remains unknown. However, it is thought to be preceded by upper respiratory tract infections (usually caused by species of streptococci, parainflenza virus, and human parvovirus B19), medications, vaccinations, or malignancies[3].

SARS-CoV-2, the single-stranded RNA virus responsible for COVID-19[4-5], often targets the respiratory system. COVID-19 can also lead to extrapulmonary manifestations, including but not limited to cardiac, thrombotic, and dermatological complications[6-7]. In some cases, unpredictable complications arise from the association of COVID-19 infection with HSP vasculitis.Our objective in this report is to describe the case of a previously healthy child affected by a possible association between previous COVID-19 infection and first-onset HSP.

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CASE REPORT

Our patient is a 28-month-old boy, with no particular medical history. Five days before his admission to our service, he presented abdominal pain, diarrhea with moelena, all of which evolved in a context of apyrexia. Two days later, the patient presented with a rash consisting of purpuric lesions of varying sizes distributed over his lower limbs bilaterally (Figure 1), extending from the soles of the feet to the knees. The rash was associated with mild edema of the ankles with pain in both knees. On admission, the patient was conscious but irritable. His neurological examination was unremarkable. He was well hydrated and showed no signs of respiratory distress or jaundice. His vital signs were as follows: temperature of 37^{o}C (measured underarm), heart rate of 105 beats per minute, respiratory rate of 22 breaths per minute, blood pressure of 10/7 mm Hg, and oxygen saturation of 98% on ambient air.

Examination of the lower extremities showed a purpuric rash made up of raised purpuric lesions on both lower extremities with some maculopapular lesions extending from the soles of the feet to the knees. Mild edema was present in the ankles bilaterally. Examination of the

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joints triggered pain on active mobilization of the knees, without inflammatory signs. No enlarged lymph nodes were noted. The cardiovascular exam was unremarkable, with normal heart sounds heard, no added noises or murmurs. The chest examination was normal, although the abdomen was tender to palpation. An abdominal ultrasound was performed urgently due to the abdominal pain with melena, which allowed us to eliminate a possible intestinal intussusception. Complete blood count showed increased white blood cell count (22.2 × 109/L), microcytic anemia (hemoglobin 11.2 g/dL) and mild thrombocytosis (4.9 × 109/L). He had normal hepatic, renal, and electrolyte function. He had no proteinuria or hematuria on urinalysis. Anti-streptolysin-O (ASLO) titer and coagulation profile were normal. Antinuclear antibodies as well as anti DNA antibodies were negative. C-reactive protein was elevated to 160mg/l. Serology for SARS-CoV-2 was positive with an IgG level of 255 AU/ml. The rest of the viral serologies were negative.

The patient was diagnosed with HSP, complicating SARS-CoV-2 infection, fulfilling 3 clinical criteria (palpable purpura and abdominal pain and arthralgia), without renal involvement. The patient was put on parenteral nutrition and treated with prednisolone, and showed good improvement.

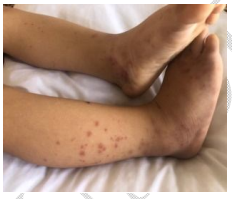

Figure 1: Purpuric lesions of varying sizes distributed over lower limbs bilaterally

DISCUSSION

HSP is an immune-mediated vasculitis involving IgA deposition in the walls of blood vessels, which mainly affects children 3 to 15 years old. The most common trigger for HSP is a

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previous upper respiratory infection. The most common cause of this type is a streptococcal infection, followed by viral infections secondary to parainfluenza virus or human parvovirus B19[9].

The patient's acute presentation of lower extremity arthralgia and maculopapular rash revealed several differential diagnoses, all of which were ruled out either by the previously mentioned investigations or by failure to meet the diagnostic criteria set for such diseases. These differential diagnoses included group A beta-hemolytic streptococcal infection, thrombotic thrombocytopenic purpura (TTP), systemic lupus erythematosus (SLE), juvenile idiopathic arthritis (JIA), Kawasaki disease, multisystem inflammatory syndrome in child (MIS-C).

Group A beta-hemolytic streptococcal infection was ruled out by negative ASLO titer, PTT was ruled out by normal platelet count, SLE was ruled out by negative ANA and anti-dsDNA antibody screen, as well as failure to meet diagnostic criteria, while JIA, Kawasaki disease, and MIS-C were excluded due to failure to meet diagnostic criteria.

To diagnose SLE, 4 of 11 American College of Rheumatology (ACR) criteria must be met[8]. Our patient, however, only experienced one (arthralgia). As for JIA, the ACR criteria state that arthritis must be present for a minimum of 6 weeks[9]. Our patient, on the other hand, only presented with arthralgia. To diagnose Kawasaki disease, fever must be present for at least 5 days, along with four of the other five criteria[10]. Additionally, to diagnose MIS-C, according to the criteria of the Centers for Disease Control and Prevention and WHO, fever is present, along with a number of other criteria that must be met[11]. Our patient, however, did not present with fever or multisystem involvement; therefore, Kawasaki disease and MIS-C were excluded.

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Our patient presented with the clinical signs and symptoms of HSP, as he had both the obligatory criterion, palpable purpura in the absence of thrombocytopenia, and two of the

secondary criteria, abdominal pain and arthralgia of acute onset. The patient was therefore clinically diagnosed with HSP.SARS-CoV-2 IgA is the first immunoglobulin to increase after infection, reinforcing the possible association between IgA vasculitis and COVID-19 infection[9]. It should be noted that there is no diagnostic test to prove the association between HSP and COVID-19 infection. Looking at both the history and laboratory tests of this patient, having had no previous infection with the previously mentioned causative organisms, but positive COVID-19 serology, in addition, a review by AbdelMassih et al [1] reported a link between COVID-19 and Kawasaki disease, another childhood vasculitis. Another case report by Chesser et al [11] reported a link between COVID-19 and acute hemorrhagic edema of infancy in an 8-month-old girl[11]. In both cases, it seems that there is a causal relationship between COVID-19 and post-infectious vasculitis, which only suggests that COVID-19 could possibly be a trigger virus for HSP in our patient.

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CONCLUSION

An association between the novel coronavirus SARS-CoV-2 and childhood vasculitis Henoch-Schonlein purpura (HSP) is reported. An infection by SARS-CoV-2 could be a triggering factor in the emergence of HSP. Ruling out a prior infection with SARS-CoV-2 in pediatric patients presenting with what clinically appears as HSP should be considered.

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DATAAVAILABILITY

No data were used in this study.

REFERENCES

1. Sohagia AB, Gunturu SG, Tong TR, et al. Henoch-Schonlein purpura-a case report and

review of the literature. Gastroenterol Res Pract2010;2010:1–7. doi:10.1155/2010/597648
2. Lim DCE, Cheng LNC, Wong FWS. Could it be Henoch-Schonlein purpura? Aust Fam Physician 2009;38:321–4.
3. Hetland LE, Susrud KS, Lindahl KH, et al. Henoch-Schönlein purpura: a literature review. Acta DermVenereol2017;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.
8. Nat Med 2020;26:1017–32.
9. 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
10. Suso AS, Mon C, Oñate Alonso I, et al. IgA vasculitis with nephritis (Henoch-Schönleinpurpura) in a COVID-19 patient. Kidney Int Rep 2020;5:2074–8.
11. et alAbdelMassih 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
12. Chesser H, Chambliss JM, Zwemer E. Acute hemorrhagic edema of infancy after coronavirus infection with recurrent rash. Case Rep Pediatr2017;2017:1–3.