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## DESCRIPTION

A 49-year-old female emergency room nurse presented with painless papular rash that started on both arms and legs and spread to her palms and soles (figure 1). She also endorsed fatigue, low-grade fever and transient arthralgia. She was sent home on topical steroids, which improved her pruritus. After 2 days, she developed an acute left flank pain with persistent rash. CT of the abdominal demonstrated an acute left-sided renal infarction; therefore, apixaban was initiated. Nonetheless, she came back 1 day later with worsening flank pain. A CT angiography showed new right-sided renal infarction in addition to multiple left renal infarctions (figure 2). She was started on intravenous heparin and systemic steroids.

A myriad of tests was conducted to investigate the aetiology of her rash and bilateral renal infarctions. Echocardiography was unremarkable and did not support any paradoxical embolism. Anticardiolipin and β2- glycoprotein antibodies were not elevated; lupus anticoagulant was not checked due to ongoing anticoagulation. Factor V Leiden and Prothrombin G20210A mutations were ruled out. Other thrombophilia work-up showed normal protein C/S levels and antithrombin III activity. With her known history of hypothyroidism and Raynaud disease and the concern for vasculitis, several rheumatological assays (antinuclear antibodies, antineutrophil cytoplasmic antibody, rheumatoid factor, anti-Jo1 antibody, antihistone antibody, etc) were performed and identified no additional autoimmune diseases or abnormal immunological conditions. Extensive infectious work-up including COVID-19 PCR, rapid plasma reagin, serologies for Coxsackie A, Rocky Mountain spotted fever, mycoplasma, Lyme disease, HIV and hepatitis were unremarkable, except for a positive Parvovirus B19 (HPV-B19) IgM antibody. However, her HPV-B19 IgG antibody was negative, which indicated an acute infection.

The patient remained without other symptoms such as cough, mouth sores, dyspnoea or any gastrointestinal disorders. She had two episodes of asymptomatic bradycardia (heart rate down to 30 s). ECG showed sinus bradycardia with no evidence of heart block. Her blood work revealed normal renal and liver functions, normal troponin and brain natriuretic peptide and a mild normocytic anaemia with normal reticulocyte count (table 1). Her flank pain subsided with supportive care and her rash resolved within a few days. She had a loop recorder placed and was discharged on enoxaparin. She recovered on her 3-month follow-up appointment except for mild persistent fatigue. Her labs on follow-up showed normal haemoglobin and a persistently elevated HPV-B19 IgM antibody with a negative HPV PCR. She was switched to apixaban for long-term anticoagulation.

Although often asymptomatic, acute HPV-B19 infection can present with constitutional symptoms, arthralgia and rash. Furthermore, our patient presented with unusual but typical erythematous papular skin lesions and oedema of her hands and feet called papular–purpuric gloves and socks syndrome (PPGSS). PPGSS usually manifests in adolescents and adults, it is different from the well-known slapped cheek syndrome in kids.[1] Atypical HPV-B19-related extra-haematological manifestations such as glomerulonephritis, myositis, myocarditis, vasculitis and nervous system involvement are less common, and often associated with immunological abnormalities.[2] Although very rare, cases of arterial thrombosis as splenic infarction and acute myocardial infarction have been reported, which

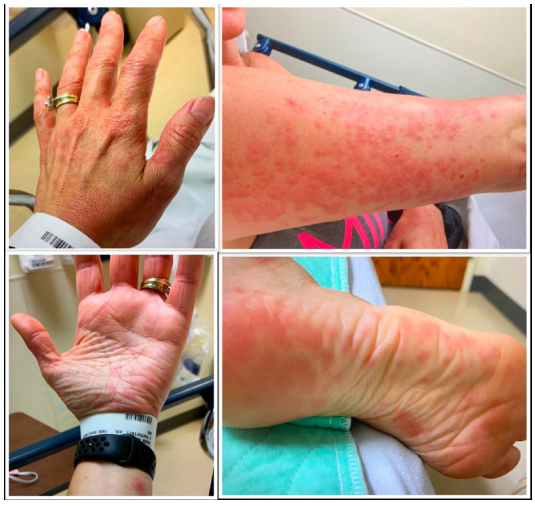

**Figure 1** Erythematous papular rash involving the arms, palms and soles.



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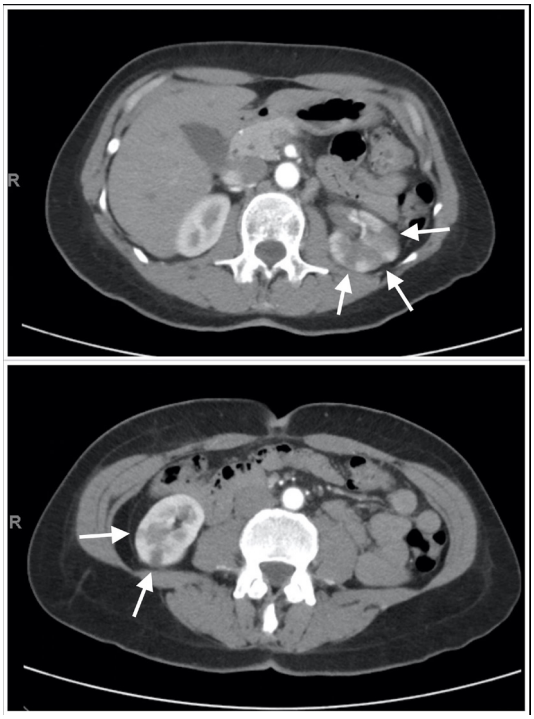

**Figure 2** CT angiography showing bilateral renal infarctions.

has broadened the spectrum of HPV-B19 infection presentations.[2 3]

We describe a case of concurrent PPGSS and bilateral renal infarction as uncommon extra- haematological manifestations correlated with HPV-B19 infection in the same patient. Our case is in accordance with the female predominance of symptomatic HPV-B19 infection and further expands HPV-B19 as a specific aetiology triggering arterial thrombosis. Even with good prognosis and response to supportive care, immunomodulatory agents with corticosteroids and/or intravenous Ig may be necessary in severe cases with neurological complications such as Gillian-Barre syndrome or mononeuritis multiplex.[2]

**Table 1** Complete blood count with differential and reticulocyte count

| Test | Result | Reference range and unit |
|---|---|---|
| White cell count | 7.8 | 3.8–10.6 $\times 10^9$/L |
| Red cells count | 3.60 (L) | 4.15–5.55 $\times 10^{12}$/L |
| Haemoglobin | 118 (L) | 120–15.0 g/L |
| Haematocrit | 34.2 (L) | 36%–46% |
| Mean Corpuscular Volume | 95.0 | 80.0–100.0 fL |
| Mean Corpuscular Hemoglobin | 32.9 | 26.0–34.0 pg |
| Mean Corpuscular Hemoglobin Concentration | 34.6 | 31–37 g/dL |
| Red cell Distribution Width | 12.8 | <14.5% |
| Platelet count | 217 | 150–450 $\times 10^9$/L |
| Neutrophil, % | 76 | % |
| Lymphocyte, % | 11 | % |
| Monocyte, % | 9 | % |
| Eosinophil, % | 3 | % |
| Basophil, % | 1 | % |
| Absolute neutrophil | 5.90 | 1.80–7.70 k/µL |
| Absolute lymphocytes | 0.90 (L) | 1.10–4.00 k/µL |
| Absolute monocytes | 0.70 | 0.00–0.80 k/µL |
| Absolute eosinophils | 0.30 | 0.00–0.70 k/µL |
| Absolute basophils | 0.10 | 0.00–0.20 k/µL |
| Retic per cent | 1.2 | 0.5%–1.5% |
| Retic absolute | 39.5 | 20.7–83.2 k/µL |

## Patient's perspective

I experienced a lot of different things when I was diagnosed with Parvovirus B-19 in August 2020. What I thought was simple rash developed into much more. Over the initial 2 days of the onset of the rash, it spread quickly, despite steroids and antibiotic treatment. It was itchy and I felt like I was burning up from the inside out without a fever. I was isolated to rule out COVID-19 and admitted to the hospital. Within 3 days of onset of the rash, I experienced a blood clot in my left kidney, my heart rate dropped into the 30's. I felt miserable and scared. I underwent a lot of testing while in the intensive care unit. I saw multiple doctors from five different services. I was poked and prodded for labs, had a ton of different tests, and Transesophageal Echo, all resulted without any answers at that time. I was negative for two different COVID-19 tests. After 5 days, I was able to go home on blood thinners. The rash was gone but none of the doctors were able to identify what the rash was or why my kidney threw a blood clot. I felt very fatigued and just felt 'off'. Three days after being discharged, I developed worsening left kidney pain and vomiting. Another CT scan showed I had multiple infarcts throughout both kidneys. I felt some of the worst pain I had ever and felt sick.

I was admitted again and had more testing done, still without answers. My heart rate was still low. The doctors transferred me to a specialty hospital where I saw doctors from five different services. After a couple of days, I started feeling better. While I was there the Parvovirus B-19 result from my first hospital, admission came back positive. This baffled everyone including myself.

Pre-Parvo B-19, I was healthy with controlled hypothyroidism, psoriasis and Raynaud's. I had a cardiac loop recorder implanted to watch for any arrythmia that may cause clots and placed on a blood thinner probably for life. Nine months later, I feel a different kind of fatigue than just being regularly tired. I have daily joint pain, sometimes with swelling. My psoriasis is spreading. I get redness and burning to the soles of my feet and palms of my hands, which I had never experienced before. I do not know the correlation with all the symptoms of then and now, but I still feel the effects of Parvo B-19, both physically and mentally.

## Learning points

- Recognise the wide clinical presentations of acute Parvovirus B19 infection including papular–purpuric gloves and socks syndrome (PPGSS) and arterial thrombosis.
- Management of PPGSS is mainly supportive but immunomodulatory agents with corticosteroids and/or intravenous Ig may be necessary in severe cases.

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