

Parvovirus B19 Infection

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A 55-year-old white woman presented with new-onset acute bilateral hand swelling and numbness, upper-limb motor weakness, generalized fatigue, bilateral popliteal inflammation, and a transient episode of left-sided jaw tetany with spontaneous resolution.

At presentation, the patient was afebrile, with no reported chest pain or dyspnea. She reported having been in relatively good health before the onset of symptoms 5 days previously. While waiting for an appointment with a rheumatologist, she had been self-treating with oral ibuprofen (600 mg), applying heating pads to her arms, and wearing cock-up wrist splints during sleep in an effort to decrease the bilateral numbness of her hands.

Her current medications were as follows: amlodipine, 10 mg daily; hydrochlorothiazide/triamterene (25 mg/37.5 mg), 1 capsule daily; levothyroxine, 125 µg daily; vitamin D, 2000 IU daily; and metformin, 850 mg twice daily. The metformin had been newly prescribed 2 weeks prior by an endocrinologist for an elevated hemoglobin A1c level and metabolic syndrome.

Her medical history included controlled hypertension and hypothyroidism (Hashimoto thyroiditis), and she was overweight, with body mass index of 29 kg/m². She had a 30-year history of antinuclear antibody (ANA) positivity, diagnosed at age 22 years. She had had a full rheumatology workup at that time and had had annual rheumatologic follow-up visits for 2

decades, during which time she had had 3 uncomplicated pregnancies, then had been discharged from rheumatologic care, since no signs or symptoms of systemic lupus erythematosus had been evident.

Physical examination revealed bilateral inflammation of the digits and the metatarsal region (**Figure 1**). The patient was unable to perform gross or fine motor skills with an inability to make a fist or grasp items. The bilateral deltoid muscles appeared swollen and tender to palpation. She was unable to extend her arms more than 30°. Periorbital swelling was present (**Figure 2**).



Figure 1. The patient's hand showing swelling at presentation (left) compared with a previous photograph of the hand at baseline (right).



Figure 2. Periorbital swelling at presentation.

What's the most likely etiology of the patient's current symptoms?

- A. Carpal tunnel syndrome
- B. Food or drug reaction
- C. Autoimmune disease
- D. Lyme disease
- E. Amyotrophic lateral sclerosis
- F. Viral syndrome

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Answer: F, Viral Syndrome

Believing the symptoms to be a possible result of the recently prescribed metformin, the patient stopped taking that medication and visited the endocrinologist. The endocrinologist did not believe the patient had lactic acidosis from metformin—although myalgia is a symptom of lactic acidosis, the latter is a rare side effect of metformin in a relatively healthy patient with normal pH and kidney function.¹ The endocrinologist ordered the following laboratory tests: urinalysis, blood urea nitrogen, creatinine, uric acid, creatine kinase, complete blood cell count, erythrocyte sedimentation rate, Lyme titers, cyclic citrullinated peptide IgG/IgA antibodies, albumin/globulin ratio, anti-double-stranded DNA, and complement. As her symptoms migrated and progressed over the next few days, the patient made an appointment with a rheumatologist, who additionally ordered tests for C-reactive protein (CRP) and antinuclear antibodies (ANA).

All of the patient's laboratory test results were within normal limits, except for the following: platelet count, $432 \times 10^3/\mu\text{L}$ (reference range, $150\text{-}379 \times 10^3/\mu\text{L}$); albumin to globulin ratio, 4.1 (reference range, 1.2-2.2); blood urea nitrogen (BUN) to creatinine ratio, 24 (reference range, 9-23); CRP, 6.1 mg/L (reference range, 0.0-4.9 mg/L); and ANA, positive, with a speckled pattern on immunofluorescence assay, which suggested the presence of anti-DFS70 antibodies, which has a low prevalence in systemic autoimmune rheumatic disease.

The rheumatologist subsequently ordered parvovirus B19 tests, the results of which were positive for IgG and IgM antibodies, indicating a more acute infection.

Differential Diagnosis

The signs and symptoms of carpal tunnel syndrome are more localized, with radiation to limbs involved, rather than generalized and migratory.

Lactic acidosis is a potential adverse effect of metformin use, although it is uncommon unless accompanied by excessive dehydration or intense exercise. The patient presented as minimally dehydrated, but BUN and creatinine levels individually were within normal limits. Upon further

inquiry, the patient had been prescribed metformin, 500 mg twice a day orally, without incident in the past.

The patient had a 30-year history of a positive ANA titer but without further elevation over that time. Her 3 pregnancies and other stressors had not led to an exacerbation of systemic lupus erythematosus, so although it remained in the differential, it was unlikely. Still, autoimmune disease remained of high concern due to the inflammation of the joints of the hands and knees, suggesting the possibility of rheumatoid arthritis and warranting further diagnostic laboratory workup.

Lyme disease was unlikely, given that the patient had done no gardening or hiking or other outdoor nature activities over the preceding winter months, and she had no outdoor pets in the home.

Amyotrophic lateral sclerosis is a rare disease of the nervous system that presents with muscle weakness and loss of coordination with difficulty grasping items; it more often affects the male population, however.

Discussion. Parvovirus B19 infection is extremely common, with acquisition of immunity predominantly during childhood and adolescence, with antibody seroprevalence of 90% in adulthood.² The viral syndrome is also referred to as fifth disease or erythema infectiosum and classically presents in children as a “slapped cheeks” appearance.^{2,3}

Adults usually do not develop the slapped-cheek rash seen in children. The most common presentation in adults is a polyarthropathy syndrome characterized by symmetric joint soreness lasting days to weeks.^{2,4} For this reason, parvovirus B19 infection should be considered in the differential diagnosis for rheumatologic workup. Most commonly affected are the smaller joints of the hands, wrists, elbows, knees, and ankles.

The infection in adults often occurs in immunocompromised individuals with reactivation of latent virus and waning IgG antibody rather than new secondary infection.⁵ Secondary symptomatic parvovirus B19 infection in healthy adults is uncommon but may be seen in community outbreaks.

Outcome of the case. It is believed that this patient had a reinfection rather than reactivation of parvovirus B19. On further discussion with the patient, who is a practicing health care provider, she reported that she had recently worked on a hospital kidney transplantation floor for several weeks with many immunocompromised patients, which may have been the source of parvovirus exposure.

Although this case was frightening to the patient and a challenging diagnosis for the provider, her symptoms of inflammation, muscle weakness, myalgia, and fatigue resolved spontaneously.

within a week, consistent with a viral syndrome, and without any further sequelae or need for treatment.

References:

1. Huang W, Castelino RL, Peterson GM. Lactic acidosis and the relationship with metformin usage: case reports. *Medicine (Baltimore)*. 2016;95(46):e4998.
2. Cennimo DJ, Dieudonne A. Parvovirus B19 infection. Medscape. <https://emedicine.medscape.com/article/961063-overview>. Updated December 6, 2018. Accessed May 24, 2019.
3. Parvovirus B19 and fifth disease. Centers for Disease Control and Prevention. <https://www.cdc.gov/parvovirusb19/>. Reviewed November 17, 2017. Accessed May 24, 2019.
4. Parvovirus infection. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/parvovirus-infection/symptoms-causes/syc-20376085>. Published May 16, 2018. Accessed May 24, 2019.
5. Kaufmann J, Buccola JM, Stead W, Rowley C, Wong M, Bates CK. Secondary symptomatic parvovirus B19 infection in a healthy adult. *J Gen Intern Med*. 2007;22(6):877-878.