Papular Purpuric Rash Due to Parvovirus B19 with Distribution on the Distal Extremities and the Face

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We describe 3 patients who presented with a distinctive clinical picture of the purpuric rash called “gloves-and-socks syndrome” which was characterized by an acral distribution of the rash that involved not only the distal part of the extremities but also the chin and perioral area. Serologic analysis for parvovirus B19 yielded positive results. Parvovirus B19 should be included in the evaluation of febrile purpura.

Human parvovirus B19 infection is a recognized cause of several clinical syndromes, such as aplastic crisis in chronic hemolytic anemia, hydrops fetalis, and arthropathy. It also has been associated with dermatologic manifestations, namely, the classic rash of erythema infectiosum, vesiculopustular rash, purpura in the absence of thrombocytopenia, Schönlein-Henoch purpura, and “gloves-and-socks syndrome” (PPGSS) [1]. Here we describe 3 patients with a new clinical presentation of parvovirus B19 infection as a petechial rash that involves the chin and perioral area in addition to the PPGSS distribution on the distal extremities.

Case 1. A 17-year-old boy was admitted to Schneider Children’s Medical Center for evaluation of fever and petechial rash of 3 days’ duration. A physical examination revealed he was in good general condition with no acute distress. The following clinical signs were noted: temperature, 39.5°C; blood pressure, 98/54 mm Hg; and pulse rate, 111 beats/min. No signs of meningeal irritation were seen. Inspection of the skin revealed a petechial rash on the chin and perioral area (figure 1), as well as on the extremities, including the hands and feet (figure 2). Other findings of the physical examination were normal.

Laboratory tests revealed the following values: erythrocyte sedimentation rate, 10 mm/h; WBC count, 2940 cells/mm³ (64% neutrophils); hemoglobin level, 12 g/dL; and platelet count, 95,000 platelets/mm³. Coagulation tests and liver and kidney function tests yielded normal results. Blood culture results were negative, as were results of cultures for adenovirus and enteroviruses and results of serologic analysis for cytomegalovirus, Epstein-Barr virus, and Rickettsia and Ehrlichia species. ELISA revealed IgM to parvovirus B19, but not IgG (Parvo Scan, B19 IgM and IgG; Eurodiagnostica) [2, 3].

The patient was treated initially with ceftriaxone and doxycycline. The fever and rash resolved within 3–4 days, and the patient was discharged in excellent condition. A second titer determination 6 weeks later showed a questionable titer of IgM but a moderately positive titer of IgG to parvovirus B19.

Case 2. An 18-year-old boy was referred to Schneider Children’s Medical Center for evaluation of a purpuric rash accompanied by fever. On physical examination, his temperature was 38.8°C; a diffuse purpuric rash in a PPGSS distribution was noted, in addition to a perioral rash (figure 3) and enanthem of the buccal mucosa.

Laboratory workup revealed the following values: sedimentation rate, 8 mm/h; C-reactive protein, 4.3 mg/dL (normal, <0.5 mg/dL); and complete blood count: hemoglobin, 14 g/dL; WBC count, 8000/mm³; and platelets, 240,000/mm³. Initial serologic analysis for parvovirus B19 yielded positive results for IgM and negative results for IgG. Serologic analysis for cytomegalovirus, Epstein-Barr virus, and Rickettsia yielded negative results.

The rash and fever resolved within a few days. Four weeks later, serologic studies were again performed and revealed a strongly positive titer of IgG for parvovirus B19 and weakly positive titer of IgM.

Case 3. A 12-year-old girl was referred to Schneider Children’s Medical Center because of acute onset of purpuric rash and fever. On examination, her temperature was 38.2°C and she was in no acute distress. A petechial rash was noted on her chin and distal extremities. Results of a complete blood count were within normal limits. She was treated with doxycycline. Serologic analysis for Rickettsia yielded negative results, but serologic analysis for parvovirus B19 yielded positive results for IgM and weakly positive results for IgG. The rash resolved within 7 days. Eight weeks later, analysis of a second serum specimen for parvovirus B19 yielded results negative for IgM and positive for IgG.

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Discussion. Human parvovirus B19, a single-stranded DNA virus, can cause a myriad of disease manifestations through different pathogenetic mechanisms, such as lysis of human erythroid progenitor cells in the bone marrow and the spleen, leading to aplastic crisis; immune-mediated mechanisms, manifesting as arthritis and rash; and injury of vascular endothelial cells, leading to different types of vasculitis [4, 5].

A rare, less recognized clinical presentation of parvovirus B19 infection is papular-purpuric PPGSS. Harms et al. [6] was the first to describe this syndrome, in 1990, as an acute, self-limited dermatosis. However, its etiologic association with parvovirus 19 was not known until 1991, when Bagot and Revuz [7] reported that IgM to the virus was present in a patient’s serum.

Since the original report in 1990, PPGSS has been documented in >30 patients. In two-thirds of them, the syndrome was related to acute parvovirus B19 infection, although other viruses also have been implicated. Most of the cases were observed in the spring and summer and almost always occurred in young adults [8–27].

The clinical manifestations of PPGSS include exanthem, mucosal lesions, lymphadenopathy, and systemic symptoms, such as low-grade fever, anorexia, and arthralgias. The rash is characterized by a painful and pruritic symmetric erythema and edema with papular-purpuric lesions of the hands and feet, with sharp demarcation at the wrists and ankles. Mucosal manifestations include petechiae, pharyngeal erythema, swollen lips, and painful oral erosions [23]. Dysuria with vulvar edema and erythema also been described [28]. The syndrome is self-limited and resolves within 7–14 days, accompanied by desquamation.

Laboratory findings include mild leukopenia, transient thrombocytopenia, and elevated liver enzyme levels. The erythrocyte sedimentation rate and the C-reactive protein level are infrequently increased. Parvovirus B19 may be confirmed as the causative agent on the basis of serologic analysis or by PCR analysis for DNA in the serum and in cutaneous biopsy specimens [15].

The reported histopathologic findings are nonspecific and include a predominantly CD3/CD30 lymphocytic, perivascular infiltrate of the papillary dermis associated with extrav-
describe a distinctive clinical picture of PPGSS, acropetechial syndrome, which involves the perioral area in addition to the extremities. Like the classic syndrome, this presentation seems predominantly to affect young adults and has the same clinical course. We suggest that acropetechial syndrome induced by parvovirus B19 should be included in the differential diagnosis of febrile purpura, especially in adolescents or young adults and in the absence of signs of toxicity. Awareness of this clinical syndrome may prevent unnecessary laboratory testing and treatment.

References