# CASE REPORT

# PURPURIC-LIKE RASH AS CUTANEOUS ERUPTIONS IN PARVOVIRUS B19 INFECTION IN THAI INFANT

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Abstract. An 8-month-old girl presented with fever, rash, and diarrhea. Physical examination revealed multiple well-circumscribed, brownish-black, purpuric-like rashes on the face, arms, and legs with cervical and suboccipital lymphadenopathy. Laboratory findings showed mild anemia with thrombocytopenia and positive polymerase chain reaction for parvovirus B19 DNA in the serum. The patient recovered uneventfully with symptomatic and supportive treatment. Since the infection can manifest in many dermatological patterns, it should also be included in the differential diagnosis of febrile illness with purpuric rash in children.

## INTRODUCTION

Parvovirus B19 infection is common worldwide and has been implicated in several diseases. The infection in a pregnant woman followed by transplacental transmission to the fetus can lead to miscarriage or hydrops fetalis (Levy *et al,* 1997). The virus also exacerbates, or in a compensated state provokes, severe anemia in patients with increased destruction of red cells and prompt higher demand for erythrocytes by causing abrupt cessation of red-cell production (Young and Brown, 2004). Arthropathy, not only arthralgia, but also inflammatory arthritis occurs in about 50 % of adults (Naides, 1998). Erythema infectiosum, or fifth disease, is the most common clinical picture associated with the virus in children (Koch, 2000; Wiss, 2003). In addition, there have been occasional reports of parvovirus B19 infection associated with other dermatologic manifestations. We hereby report a child who presented with fever and purpuric-like rash.

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## CASE REPORT

An eight-month-old girl was admitted to our infectious ward with a presentation of high fever, rash, and diarrhea before admission. A week prior to the admission, she had high fever, coryzal symptoms, and rash. The rash first appeared on the face and both feet, and progressed to involve both arms. Two days later, she developed a febrile seizure that lasted for a few minutes and was treated with a diazepam rectal suppository at a private clinic. On the following day (the 3rd day of illness), the rash gradually darkened and the fever subsided significantly, while the diarrhea occurred two days later (the 5th day of illness). She had been healthy before the illness. However, she had been exposed to a neighbor who had developed an undiagnosed exanthematous disease. Physical examination revealed an afe-

brile and active girl. Multiple well-circumscribed, brownish-black and purpuric-like rashes appeared on the face, arms, and legs. Cervical and suboccipital lymphadenopathy was observed. The other findings were unremarkable.

Laboratory results showed a hemoglobin level of 10 g/dl, with mean corpuscular volume (MCV) 59 fl, mean corpuscular hemoglobin (MCH) 18 pg and red blood cell distribution width (RDW) 16.2. White blood cell count was 15,000 /mm$^3$ with differential count of 7% neutrophils, 60% lymphocytes, 12% atypical lymphocytes, and 21% monocytes; and the platelet count was 51,000 /mm$^3$. Hypochromic microcytic red blood cells and mild anisopoikilocytosis were observed on a peripheral blood smear. The diagnosis of viral infection was based on the history, physical examination, and basic laboratory results. The causative organism was confirmed by electrophoresis of polymerase chain reaction amplification of parvovirus B19 DNA in the serum. The electrophoresis was performed with a known 276 base-pair parvovirus B19 positive DNA sample (AY 251006) as positive control (Fig 1). The method of parvovirus B19 detection had been previously reported (Sanphasitvong *et al,* 2005). Diarrhea and vomiting was gradually resolved with supportive and symptomatic treatment.

## DISCUSSION

Parvovirus B19 is a single-stranded DNA virus. It has the highest prevalence in school-aged children, with 70 % of cases occurring between 5 and 15 years of age (Koch, 2000). Serological studies show increasing prevalence with age (Wiss, 2003). The seroprevalence of parvovirus B19 infection in Thailand has been shown to be 10.94% in young adults (Bhattarakosol *et al,* 2003) and 20.16% in all age groups (Poovorawan *et al*, 2000). It is thought to be transmitted primarily by the respiratory route via droplets (Koch, 2000; Wiss, 2003). In addition, parvovirus B19 is also transmissible by blood and blood products (Koch, 2000). Parvovirus B19 infection is usually brief and self-limited in healthy individuals; in immunosuppressed patients, however, the infection may be chronic and persistent (Sklavounou-Andrikopoulou *et al*, 2004).

Since the primary target of parvovirus B19 infection is the erythroid cell line, transient aplastic crisis as a direct result of viral infection is one of the manifestations (Koch, 2000). The other clinical entities such as exanthem and arthritis appeared to be postinfectious phenomena related to immune response (Koch, 2000).

Concerning the wide spectrum of cutaneous manifestations, erythema infectiosum, or fifth disease (characterized by a “slapped-cheek” appearance), is the most common

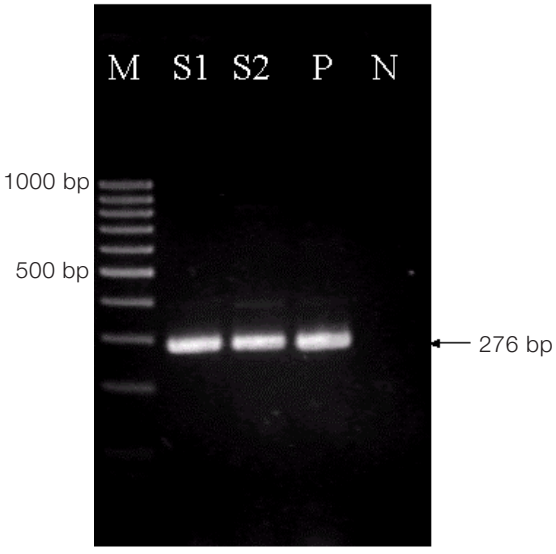


Fig 1–Agarose gel electrophoresis of PCR amplification of parvovirus B19 DNA in the serum; S: specimen (S1: patient’s specimen, S2: another’s specimen); P: positive control; N: negative control.

manifestation of parvovirus B19 infection in children (Drago *et al*, 1999; Koch, 2000; Wiss, 2003). The rash associated with fifth disease may be evanescent, and its recurrence can be provoked by exposure to sunlight, heat, emotion, or exercise (Young and Brown, 2004). The others are papular-purpuric gloves and socks syndrome (Petter *et al,* 2001; Alfadley *et al*, 2003; Hsieh and Huang, 2004), asymmetric periflexural exanthem of childhood (Gelmetti and Caputo, 2001; Nahm *et al,* 2002), acute hepatitis and purpuric exanthem (Drago *et al*, 1999), vesicopustular eruptions (Naides *et al,* 1988), Henoch Schönlein purpura (Ferguson *et al*, 1996), and systemic lupus erythematosus (Diaz *et al,* 2002). Its systemic features are rare in children (Sklavounou-Andrikopoulou *et al*, 2004).

The papular-purpuric gloves and socks syndrome occurs mostly in young adults and has been shown to be related to several possible viral infections (Petter *et al*, 2001). It characteristically consists of pruritic and painful edema and erythema with subsequent acral petechia localized at the distal part of the upper and lower extremities in a gloves-and-socks pattern; sometimes it is associated with oral lesions (Hsieh and Huang, 2004). It may accompany general symptoms such as anorexia, lymphadenopathy, or respiratory and gastrointestinal symptoms (Alfadley *et al*, 2003).

Asymmetric periflexural exanthem of childhood is typically described as a maculopapular scarlatiniform eruption involving one axillary fold with a centrifugal spread to the thorax and the proximal part of the corresponding arm, but rarely involving an antecubital or popliteal fold (Nahm *et al*, 2002). The alternative term is “unilateral laterothoracic exanthem in childhood” (Gelmetti and Caputo, 2001).

The brownish-black rash, purpuric-like eruption in our patient is interesting. Even though the distribution is not typical of either the gloves-and-socks pattern or asymmetric periflexural exanthem of childhood, parvovirus B19 infection should be considered because of its purpuric-like appearance.

Laboratory diagnosis of parvovirus B19 infection relies on serologic and DNA tests (Young and Brown, 2004). Serological tests can be proved by specific anti-HPV B19 IgM antibodies or seroconversion of anti-HPV B19 IgG antibodies in paired sera (Koch, 2000). Nevertheless, in many parvovirus B19 – associated purpuric rash, specific IgM antibodies have not been demonstrated in the serum at the time of the initial presentation (Alfadley *et al*, 2003; Sklavounou-Andrikopoulou *et al*, 2004). The diagnosis for this patient, due to the purpuric-like rash, was confirmed by polymerase chain reaction for parvovirus B19 DNA in the serum.

To date, there is no specific antiviral therapy for the disease. Intravenous immunoglobulin (IVIG) has been used with some success to treat anemia and bone marrow failure in immunocompromized children (Koch, 2000). Our patient recovered uneventfully with only symptomatic and supportive treatments.

In summary, Parvovirus B19 is common worldwide. The infection can manifest in many clinical patterns, ranging from an asymptomatic condition to life-threatening disease. Concerning cutaneous manifestations, erythema infectiosum, papular-purpuric gloves and stocks syndrome, asymmetric periflexural exanthem of childhood, purpuric exanthem, vesicopustular eruptions, Henoch Schönlein purpura and systemic lupus erythematosus have been established an association with parvovirus B19 infection.

Because parvovirus B19 infection manifests a wide spectrum of dermatological pictures, it needs to include parvovirus B19 infection in the differential diagnosis of fever with purpuric rash.

## ACKNOWLEDGEMENTS

This work was supported in part by the Center of Excellence in Viral Hepatitis, Faculty of Medicine, Chulalongkorn University; and the Thailand Research Fund, Senior Research Scholar.

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