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Aplastic crisis due to human parvovirus B19

Sayato Fukui [a,b,*], Atsuko Hojo [a], Umihiko Sawada [a], Yoshimasa Kura [a]

[a] Department of Hematology, Kasukabe Medical Center, Japan
[b] Department of General Medicine, Juntendo University Faculty of Medicine, Japan

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Case illustration

A 32-year-old woman presented with arthralgia and faintness. She had no relevant medical history and was not taking any oral medication. For the past week she had been experiencing a slight fever and bilateral knee pain. She visited a nearby medical practitioner because the faintness had gradually worsened. A blood test detected 7.1 g/dL of hemoglobin, so she was referred to our hospital the next day.

At the consultation, her vital signs were: Glasgow Coma Scale, E4V5M6; temperature, 38.0 °C; blood pressure, 116/68 mmHg; pulse, 90 bpm; respirations, 14/min; and percutaneous oxygen saturation, 99%. Physical examination revealed mild skin rash. The blood test results were: hemoglobin, 7.1 g/dL; reticulocyte, 2.8%; mean corpuscular hemoglobin concentration (MCHC), 38.6%; and C-reactive protein level, 0.29 mg/dL. The patient also revealed that her 5-year-old child was absent from kindergarten that day because of fever.

The arthralgia and mild skin rash prompted additional blood tests, which showed that she was positive for human parvovirus B19 IgM. Her child also tested positive for human parvovirus B19 IgM. However, the cause of the anemia could not be explained at this stage. Since the MCHC was elevated, a peripheral blood smear was conducted, which revealed spherical erythrocytes (Fig. 1). Upon suspicion of hereditary spherocytosis, an erythrocyte osmotic resistance test was performed (Fig. 2-1, 2-2). In hereditary spherocytosis, the membrane is abnormally small and easily hemolyzed, leaving little room for water to be taken in from the outside. The cause of the anemia was determined to be an aplastic crisis of hereditary erythrocytosis induced by acute human parvovirus B19.

Hereditary erythrocytosis (HS), first described in 1871, is a disease that results in anemia due to the destruction of red blood cells caused by a genetic abnormality of the erythrocyte membrane. The main symptoms are anemia, splenomegaly, gallstones, and jaundice [1]. In this case, the mother had a history of cholecystectomy for cholelithiasis. Parvovirus B19 infection is also associated with erythema infectiosum [2]. Parvovirus B19 infection can result in an aplastic crisis in patients with underlying chronic hemolytic anemia, including HS [2]. This case resolved spontaneously; however, splenectomy may be considered in cases of repeated aplastic crisis [3].

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Ethical approval

No ethical approval was required for this publication.

Consent

Informed consent was obtained from the patient.

Author contributions

The authors treated the patient, drafted and critically reviewed the manuscript, and approved the final version.

* Correspondence to: Department of General Medicine, Juntendo University Faculty of Medicine, 2-1-1 Hongo, Bunkyo-ku, Tokyo 113-8421, Japan.
E-mail address: sfukui@juntendo.ac.jp (S. Fukui).

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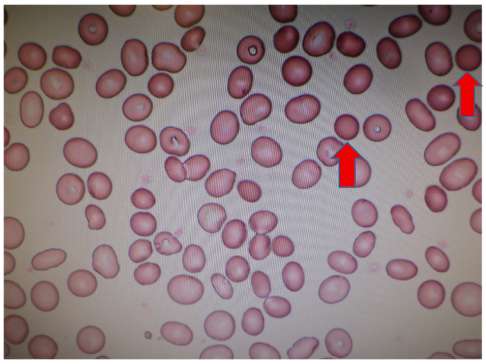

Fig. 1. Peripheral blood smear showing small, spherical, darkly-stained red blood cells (red arrows). (May Giemsa staining, magnification ×400).

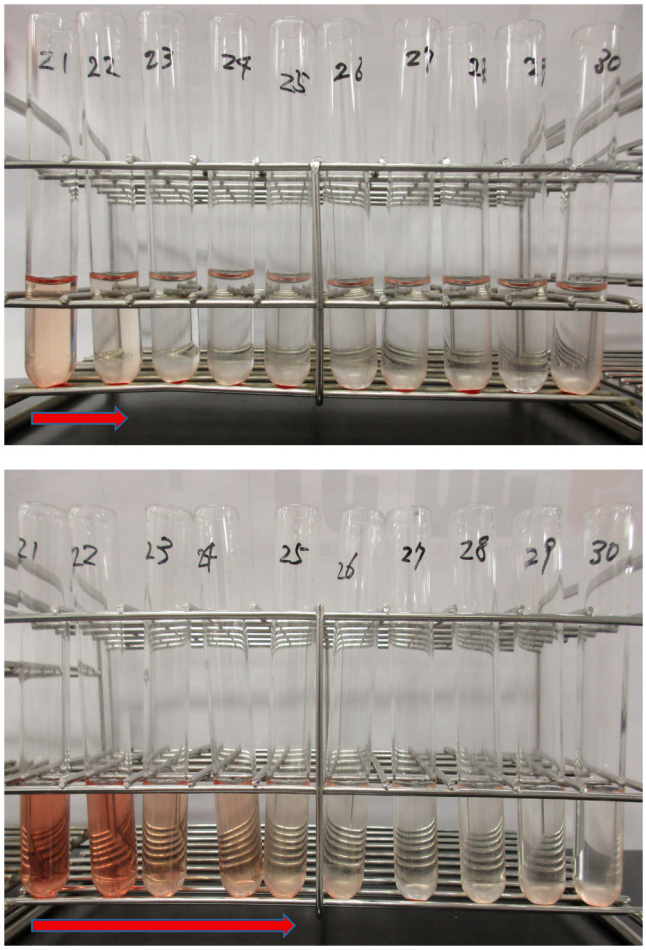

Fig. 2. Erythrocyte osmotic resistance test: Control (2-1), this case (2-2). Prepare test tubes containing solutions with NaCl concentrations set from hypotonic to hypertonic in 0.05% increments (hypotonic: 21× hypertonic: 30). Normal erythrocytes have normal erythrocyte membranes and deformability, so they can hemolyze in hypotonic water but also can tolerate hypertonic water without hemolysing because of the small amount of incoming water (2–1; Control). However, in hereditary spherocytosis (HS), the membrane is abnormal and small, leaving little room for water to enter, and hemolysis occurs easily (2–2; this case). Hemolyzed test tubes: red arrows.

Declaration of Competing Interest

None declared.

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References

[1] Vanlair C, Masius J. De la microthemie. Bull Acad R Med Belg 1871;5:515–611.
[2] Schwarz TF, Boroń-Kaczmarska A. Infection with parvovirus B 19 virus in humans. Pol Tyg Lek 1993;48:240–2.
[3] Schilling RF. Spherocytosis, splenectomy, strokes, and heat attacks. Lancet 1997; 350:1677–8. https://doi.org/10.1016/s0140-6736(05)64276-6.