Splenectomized patients had mean contents of 64.4% and 79.1% for typical and severe HS (53.2% and 74.3% for the propositi). Corrected ankyrin deficiency and 6 cases had combined spectrin and ankyrin deficiencies.

As in other studies, combined spectrin and ankyrin deficiency was the most prevalent abnormality in our patients. Spectrin deficiency is usually due to a primary decrease of ankyrin deficiency and normal or increased spectrin and ankyrin contents have been reported elsewhere. Our results might be due to variations in relative prevalences and methodological limitations because SDS-PAGE in continuous systems tends to undervalue protein bands. This fact could explain our small number of HS cases with band 3 deficit and the lack of significant differences in protein contents between unsplitenkated and splenectomized patients. SDS-PAGE in discontinuous systems with gradient gels yields a more accurate evaluation of protein bands.

**References**


**Acute Parvovirus B19 infection as a cause of autoimmune hemolytic anemia**

A patient with homozygous beta-delta thalassemia developed a severe cold hemagglutinin disease with reticulocytopenia. Acute parvovirus B19 infection was suspected because of the presence of anti-B19 IgM in serum and viral DNA analysis in bone marrow. Evidence of recent B19 infection should be sought in patients with autoimmune hemolytic anemia (AIHA).

Sir,

Human parvovirus B19 (B19) has been reported rarely as producing autoimmune hemolytic anemia (AIHA). In this report, a case of severe AIHA fol-
Following acute B19 infection is described. A 5-year old girl with homozygous βδ thalassemia (Hb basal values: 7-8 g/dL) was admitted to our hospital because of a six-day period of fever. She presented with a fine facial rash and petechiae in her armpits and on her palate. Complete blood count showed: Hb 4.3 g/dL, white blood cell count (WBC) 3.6 x10⁹/L, platelets 48x10⁹/L. Specific IgM and IgG anti-B19 were positive (ELISA), and she was diagnosed as having a transient aplastic crisis due to B19 infection. Shortly thereafter, she was discharged from the hospital in a good clinical state and the following hemogram: WBC 11.2x10⁹/L, Hb 7.4 g/dL, platelets 449x10⁹/L.

Four days later the patient was readmitted due to the reappearance of fever (40º C) and progressive paleness. Hb value was 4.4 g/dL, with a reticulocyte count of 0.8%, hemoglobinuria (14 g/dL), hemoglobinemia (2.5 g/L), and undetectable serum haptoglobin level. LDH and total bilirubin were 7,663 UI/L and 2.3 mg/dL, respectively. Leukocyte and platelet counts were normal. Bone marrow examination revealed erythroid hyperplasia (myeloid/erythroid ratio 1:8). IgG and IgM anti B-19 antibodies were positive and B19 infection was confirmed by DNA analysis in a bone marrow sample.5

Immunohematologic studies showed a positive direct antiglobulin test (IgG, C3d+), and a positive antibody screening test (titer <1:1024). When cooled at 4º C serum strongly agglutinated test cells (titer: >1:2,056), with agglutination persisting at 30ºC (titer: 1:64). The antibody disappeared after treating the serum with dithithreitol, suggesting it was IgM. Studies with antibodies against I, i, P, and Pr antigens showed no specificity. The eluate, Donath-Landsteiner and in vitro test for monophasic acid hemolysins yielded negative results.

Treatment with prednisone, intravenous immune globulin and transfusion of warmed RBCs was started immediately. However, hemolytic activity persisted (Hb value of 3.7 g/dL), and four plasma exchanges were then performed. Transfusion requirements were reduced, hemoglobinemia disappeared, and LDH levels decreased (1,500 IU/L). Three weeks after the last plasma exchange the hemoglobin level returned to baseline values (7-8 g/dL). The girl’s clinical course is shown in Figure 1. B19 uses the high-frequency red cell P antigen as a specific receptor for infection, leading to several hematologic manifestations.6,7 However, AIHA has been rarely observed; only four similar cases are reported (Table 1).1-4 Unlike the previous cases, the B19 infection in our case was diagnosed based on the demonstration of viral DNA in bone marrow. Likewise, although clinical manifestations were similar to the previously reported cases, the clinical course in this child was more aggressive. The patient also had reticulocytopenia, but her bone marrow showed erythroid hyperplasia, suggesting that the antibody had some effect on maturing red-cell precursors, preventing their extrusion into the circula-

![Figure 1. Course of AIHA due to B19 infection. Black arrows indicate red blood cell transfusions (RBC). White arrows indicate plasma exchanges (PE).](image-url)

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Abbreviations: DAT: Direct antiglobulin test; IVIG: Intravenous immunoglobulin; NA: Not available; RBC: Red blood cell; PE: Plasma exchange.

Table 1. Autoimmune hemolytic anemia due to acute B19 infection.
Nevertheless, it is also possible that the bone marrow examination actually showed relative erythroid hypoplasia. Many patients with homozygous thalassemia have intense erythropoietic marrow activity, with M:E ratios of 1:20. Thus, in this case, a M:E ratio of 1:8 may not truly reflect hyperplasia relative to this child’s baseline condition.

Due to the different results reported in the immunohematologic studies, a definite explanation about the mechanism of B19-AIHA is still lacking. Some authors have reported a positive Donath-Landsteiner test after B19-AIHA. This was not found in our patient.

We believe that evidence of acute B19 infection should be sought in patients with AIHA, particularly when associated with reticulocytopenia. Likewise, B19 should be listed among the viral illness associated with acute AIHA.

Key words
Autoimmune hemolytic anemia, IgM antibody, parvovirus B19, reticulocytopenia.

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References