PYRUVATE KINASE DEFICIENCY – A LONG WAY TO A CORRECT DIAGNOSIS

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Moroz H.I.[1], Kramar T.O.[2], Karpenko N.M. [2], Medvedieva O.P.[3], Kandronkina G.B.[3], Vydyboretz S.[1], Sova V.[3]
[1] Department of Haematology and Transfusiology, Shupyk National Healthcare University, Kyiv, Ukraine
[2] Department of pediatric oncohematology, Regional Oncology Center, Kyiv, Ukraine
[3] National Children's Specialized Hospital «Ohmatdyt», Kyiv, Ukraine

Introdution:
Pyruvate kinase deficiency (PKD) is the most commonly encountered glycolytic enzymopathy associated with anemia. Anemia, jaundice and splenomegaly are regularly present in PK deficiency. The anemia may be profound, occurring in utero or in early infancy, and require regular blood transfusions for survival. The differential diagnosis includes the heterogeneous group of congenital and acquired hemolytic disorders. We present a clinical case of congenital hemolytic non-spherocytic anemia with a correct diagnosis of pyruvate kinase deficiency.

Aim:
To describe a case of a patient with PKD

Case Report

The girl was born in June 2016. She had suffered severe anemia since the neonatal period. After birth complete blood count showed Hb 65 g/L, red blood cell count (RBCs) 1.68 × 109/L, mean corpuscular volume 106.8 fL, mean corpuscular hemoglobin 36.9 pg, mean corpuscular hemoglobin concentration 34.2 pg, red cell distribution width 24.1% and reticulocytes 16.8% . A blood film examination showed marked anisopoikilocytosis, polychromasia, rare elliptocytes, ovalocytes, and spherocytes. She received first erythrocyte transfusion after birth, then she needed transfusions every 1-2 months. Complete hematological examination, differential diagnosis of anemia was performed at the age of 4 months. Direct Coombs' test and Parvovirus B19 PCR analysis were negative, G6PD activity, hemoglobin electrophoresis were normal. Bone marrow aspiration showed erythroid hyperactivity together with a small number of double and multinucleated erythroid precursors, which may indicate CDA. Pyruvate kinase activity we were able to do only at the age of 11 months. The PK enzyme level was normal, which was 1 month after the last transfusion. Unfortunately, we could not analyze hereditary haemolytic anemia panel for 5 years of the disease. Finally, in May 2021, molecular analysis of the PK-LR gene revealed the presence of heterozygous c.1529G> A (p.Arg.510 Gln) mutation. However, no genetic mutation detected concerning CDA (SEC23B, CDAN1).

Discussion

Congenital hemolytic anemias are a group of diseases characterized by premature destruction of erythrocytes as a consequence of intrinsic red blood cells abnormalities. Pyruvate kinase deficiency (PKD) is the most common congenital haemolytic anaemia due to a glycolytic enzyme deficiency. The diagnosis of PKD ia based on the presence of clinical signs and symptoms and laboratory markers of chronic haemolytic anaemia, on reduced PK enzymatic activity and of compound heterozygous and homozygous mutations in PKLR gene.

Conclusions

The diagnostic approach to transfusion-dependent hereditary hemolytic anemia could be challenging related to false normal erythrocyte enzyme studies. Genetic analysis of PK-LR should be performed in patients with regular transfusions.

Key words

Anemia, pyruvate kinase deficiency, genetic analysis