

MEGALOBLASTIC ANEMIA AND DIABETES IN A YOUNG GIRL

A. MESSAAOUI, A. STOUPA, C. DE LAET, C. VILAIN, A. FERSTER, S. TENOUTASSE, H. DORCHY
UNIVERSITY CHILDREN'S HOSPITAL QUEEN FABIOLA, UNIVERSITÉ LIBRE DE BRUXELLES, BRUSSELS, BELGIUM

● **INTRODUCTION:** Rogers syndrome or thiamine responsive megaloblastic anemia (TRMA) with diabetes mellitus (DM) and deafness is an uncommon early onset autosomal recessive disorder (1). In addition of the typical triad, cardiomyopathy and visual impairment have been observed.

● **CASE REPORT:** We report the case of an eleven-month-old girl with TRMA. She was admitted to the hospital with paleness, hypotonia, diarrhea and fever since 10 days.

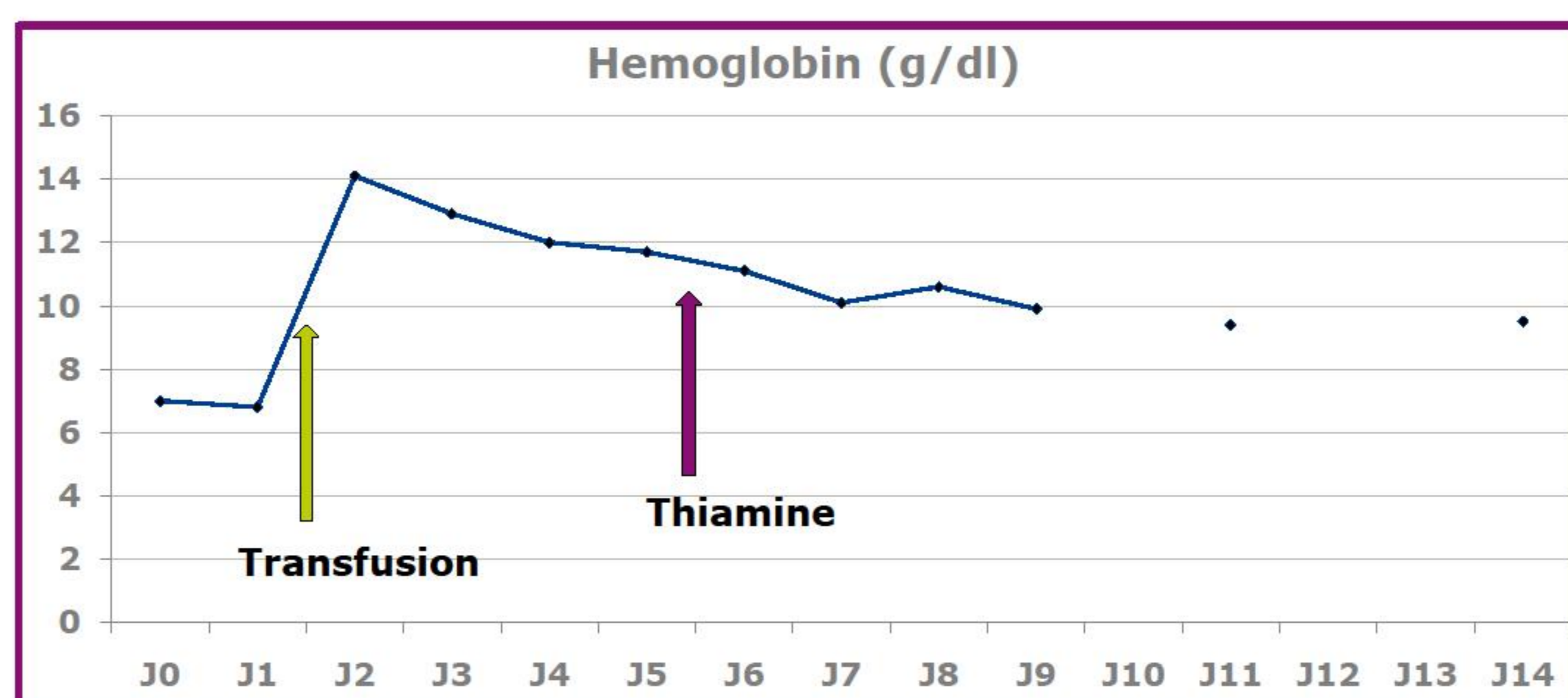
She was born to first degree consanguineous Moroccan parents. She and her twin brother were the last of a family of six siblings. The first child has anemia. The fourth died (unknown cause) at the age of 15 days. Our proband's twin brother died at the age of 6 weeks (pancytopenia, pulmonary aspergillosis, digestive hemorrhage and cardiac insufficiency). Our patient medical history was relevant for hemolytic anemia at the age of 1 month, not followed up.

On physical examination, the girl was pale and dehydrated.

Laboratory investigations revealed hemoglobin 7 g/dl, folic acid 22 µg/l (N 3-20 µg/l), vitamin B12 628 ng/l (N 180-500 ng/l), iron 74 µg/dl, ferritin 202 µg/l. Blood smear showed anisocytosis with a predominance of macrocytic cells. The bone marrow aspirate showed hypercellularity, ringed sideroblasts and abnormal erythropoiesis with megaloblasts. Hemoglobin electrophoresis was normal. On admission, serum glucose was 429 mg/dl, HbA1c 9.4% (N 4.0-6.2%) and C peptide level 0.8 µg/l (N 0.5-3.0 µg/l). IAA, ICA, GADA and IA2A were negative. Electrocardiography and echocardiography were normal. Auditory evoked brainstem responses revealed deep to total sensorineural hearing loss. Electroretinogram findings showed loss of cone response.

Severe macrocytic anemia and hyperglycemia led us to the diagnosis of TRMA and oral thiamine was given 100 mg/d.

Hemoglobin remained stable between 10.9 and 11.5 g/dl. Blood glucose levels were controlled with low insulin doses (0.2 IU/kg/d). Audiometry failed to demonstrate any amelioration. The diagnosis was confirmed by molecular analysis, which showed an homozygote mutation in the nucleic acid sequence of exon 2 introducing a premature stop codon.



● **DISCUSSION:** Our patient presents a TRMA with DM, anemia and deafness associated with ophthalmologic disorders. Treatment with pharmacological doses of vitamin B1 improved the clinical features but had no effect on the hearing loss. The causal gene of TRMA is SLC19A2, encoding a high-affinity thiamine transporter. The defect results in metabolic anomalies in different tissues (2). Diabetes is a non-type 1 DM. The insulin requirement is reduced during thiamine therapy but long-term follow-up shows a progression of pancreatic endocrine insufficiency (3). Various types of anemia, which respond to therapy, are described in TRMA (megaloblastic, sideroblastic, or aplastic). Hearing loss is irreversible (4). Ocular symptoms are inconsistent in association with TRMA.

CONCLUSION: TRMA should be kept in mind in the differential diagnosis of DM and/or megaloblastic anemia especially if consanguinity is present.

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