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A Case Of Familial Hemolytic Anemia – A Case Report

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Abstract

Hereditary spherocytosis is a relatively common type of haemolytic anemia . This case of haemolytic anemia which on detailed family screening and investigations turned out to be hereditary spherocytosis.

Keywords: Hereditary Spherocytosis , Hemolytic Anemia

Introduction

Hereditary spherocytosis is caused by RBC membrane structural defect and is characterized by hemolysis of variable intensity causing anemia and intermittent jaundice, splenomegaly, spherocytosis, increased osmotic fragility of the RBCs and responsiveness to splenectomy.The molecular defect in hereditary spherocytosis is a deficiency in spectrin, ankyrin, band 3 or protein 4.2 which are membrane skeletal proteins.

Case Report

A 29 Years Male patient mason by occupation was admitted with yellowish discolouration of eyes on and off-19 yrs. He gives history of easy fatigability during these episodes. He took native treatment for jaundice during the episodes and give history of jaundice at birth. Patient is born to 3rd degree consanguineous parents. Father has jaundice ,elder sister and her two sons had jaundice and his elder two siblings died of jaundice at 4 months of age. His daughter had neonatal hyperbilirubinemia requiring exchange transfusion.

On examination patient had stable vitals pallor and icterus was present .Cardiovascular ,Respiratory and CNS examination was normal .Per abdominal examination revealed live which was palpable 4cm under right costal margin and splenomegaly of 6cm.

Investigations

Hb-10.3gm/dl, **TC** -12000, **DC**- P70% L16%, **Platelet Count** -2.07lakhs, HCT 25.7%, MCV-89.2fl, MCH-37.5pg, **MCHC**-42.6gm/dl.ESR-20mm/hr, **Reticulocyte count**-10%, **Absolute Reticulocyte Count** -6.1%, **Reticulocyte Production Index**-4.08%
RFT Urea -30mg/dl,S Creatinine -0.9mg/dl
LFT Total Bilirubin 5.8mg/dl,Direct- 0.4mg/dl,SGOT -22 IU/L,SGPT-20 IU/L,ALP-56 IU/L,T Protein-8.6gm/dl, Albumin-5.8gm/dl,Globulin – 2.8gm/dl
S LDH – 338IU/L ,Urine routine - normal
ECG,X Ray chest – Normal,
USG Abdomen and KUB -Mild hepatomegaly and moderate splenomegaly.
HIV ,HBsAg,Anti HCV –Negative Thyroid function test – normal range
Peripheral Smear –Red blood cells shows moderate anisopoikilocytosis they are normocytic normochromic admixed with macrocytes,occasional microcytic hypochromic cells and many spherocytes .Ocassional nucleated RBCs seen .WBC's are increased in count with increase in neutrophils. No atypical cells seen. Platelets are adequate in count

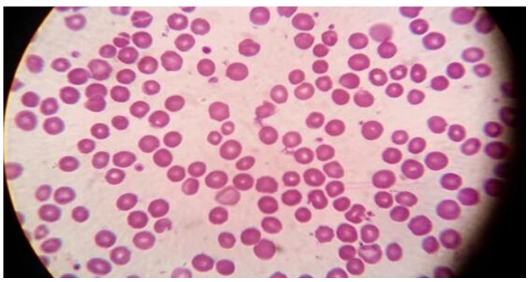

IMAGE 1: PERIPHERAL SMEAR EXAMINATION SHOWING SPHEROCYTES

Direct Coombs test - negative
Blood C&S - no growth Urine C&S - no growth
Serum iron - 151.7microgram/dl Serum ferritin - 119.2ng/ml
Transferrin saturation - 27.1% TIBC - 559.8
Hb Electrophoresis – no abnormal haemoglobin peaks
OSMOTIC FRAGILITY TEST – INCREASED OSMOTIC FRAGILITY

Bone marrow smears are cellular M:E ratio 3:1 Erythroid series is active and shows micronormoblastic and normoblastic type of maturation Leucopoiesis shows normal pattern of maturation no blast or atypical cells seen. Megakaryocytes are occasionally seen.

Family Screening

RELATIONSHIP	DAUGHTER	SISTER	NEPHEW	NEPHEW
AGE	9M	30YRS	12YRS	10YRS
SYMPTOM	+	+	+	+
Hb	10.4	9.3	8.6	9.9
PERIPHERAL SMEAR	MICROCYTIC HYPOCHROMIC ANEMIA WITH SPHEROCYTES	MICROCYTIC HYPOCHROMIC ANEMIA WITH MANY SPHEROCYTES	MICROCYTIC HYPOCHROMIC ANEMIA WITH MANY SPHEROCYTES	MICROCYTIC HYPOCHROMIC ANEMIA WITH SPHEROCYTES
DCT	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE
OSMOTIC FRAGILITY	INCREASED	INCREASED	INCREASED	INCREASED

TABLE 1 FAMILY SCREENING

Final Pedigree Chart

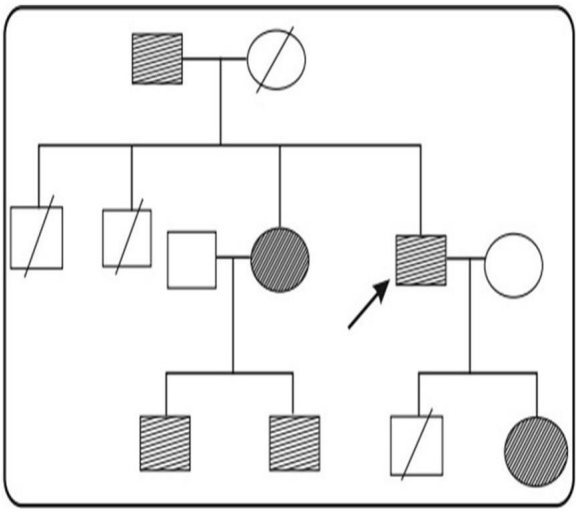

FIGURE 2 PEDIGREE CHART

Treatment - Patient underwent splenectomy

Follow up –Red cell indices are within normal limits post splenectomy. Other affected family members are being motivated for splenectomy .

Discussion

Hereditary spherocytosis (Minkowski Chauffard disease) belongs to the class of congenital hemolytic anemias . Hereditary spherocytosis has been recognized to be a familial hemolytic disorder with an autosomal dominant inheritance. Incomplete penetration and new mutations have been observed in some families. The incidence has been reported to be 1 : 1000 to 1 : 4500 in the western literature,1although it is believed to be quite rare in India.

Clinically, the disease manifests itself depending on the various mutations of genes that encode membrane proteins, their various functional consequences, and the mode of inheritance. (2)Disease is named after the microscopic morphology of erythrocytes sphere-shaped), and this change also makes it more fragile than usual, causing its rupture. (3)

In 1900, Oskar Minkowski was the first to describe this disease and published his observations on familial clusters. (4). These defects decrease the deformability of the erythrocytes and accelerate their degradation in the spleen (5). The most frequentlyaffected genes are those encoding the membrane proteins spectrin ,ankyrin, band 3.

The diagnostic features are the presence of characteristic microspherocytes (red cells are uniform, 6 to 7 microns in size, thicker than normal and show intense staining with lack of central pallor), increased osmotic fragility when the red blood cells are exposed to solutions of varying osmolalities, increased autohemolysis on the incubation of red cells at 37°C (corrected by the addition of glucose). The MCV is slightly reduced in general, and the MCHC is increased. Spheroidicity may be quantitatively assessed by the measurement of the osmotic fragility of the RBC on exposure to hyposmotic solutions causing a net influx of water.1, and spectrin.(6)

The characteristic features in hereditary spherocytosis are anemia, jaundice, splenomegaly and family history. Seventy percent of all people affected by hereditaryspherocytosis suffer from an autosomal dominant trait, while only 15 percent have an autosomal-recessive inheritance. (2)

Splenectomy is considered the standard surgical treatment in moderate and severe forms of hereditary spherocytosis. It is indicated forpatients (particularly children), with recurrent hemolytic crisis, significant splenomegaly, severe aplastic crisis, cholelithiasis and developmental delay. Splenectomy should therefore be carried out as late as possible, preferably after the age of 6 years; before this age it is only warranted in very severe transfusion-dependent

disease and even so, should not be carried out before the age of 3 years (Gallagheret al, 1998) (grade B recommendation).

Conclusion

The methodology of diagnosis and clinical management of HS has changed over the past three decades. For many years, the diagnosis was usually followed almost automatically by splenectomy. The diagnosis was often all too evident, but difficult cases were rarely made easier by performing an osmotic fragility test. There then followed a period when splenectomy fell from favour because of the risks of postsplenectomy sepsis. However, presplenectomy immunization against S. Pneumonia (together with Hib and meningitis C vaccines if not already given as part of routine vaccination) together with prophylactic antibiotic therapy has reduced, although not totally eradicated, the risk.

The indications for splenectomy have become somewhat clearer and it is now possible to classify the majority of cases of HS into mild, moderate and severe. Splenectomy will be of benefit in all cases with severe and some cases with moderate HS, but is not usually necessary in mild cases. However, the final decision will rest on consultation between the family and clinician.

In our case, the patient underwent splenectomy and had recovery of symptoms. The other affected family members are planned for the same. This case highlights the classical pattern of inheritance and the importance of detailed history taking , so that such disorders can be diagnosed early and treated before it is too late.

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