CLINICAL VIGNETTE

Effect of Bone Marrow Suppression on Screening for Severe Combined Immunodeficiency

Safa Q. Albustani, MD, Mustafa Albustani, MD and Sara Alsarray, MD

Introduction

SCID is an inherited condition in which the body is unable to fight off serious and life threatening infections. It is estimated to affect one in 50,000 to 60,000 live births. Methods for screening of newborns for Severe Combined Immunodeficiency (SCID) reported in the literature involve the quantitative assessment of T-cell receptor excision circles (TRECs), as a biomarker of naïve T-cell production. In February 2015, Oklahoma included TRECs as screening method for SCID in newborn screening. We report a case of false positive TREC due to Neonatal lupus erythematosus (NLE) which is a rare passively acquired autoimmune syndrome resulting from the transplacental passage of maternal anti-Ro/SSA and/or anti-La/SSB antibodies to the fetus. Affected infants typically present with characteristic skin lesions, congenital heart block, thrombocytopenia and anemia.[1-3]

Case Presentation

A five-week-old male baby, born by cesarean section at term without complications, was brought to our clinic for evaluation of positive T receptor screening. He was born to 30 year old mother with Sjogren's disease with +SSA antibody. He was initially sent to nursery, where he was noted to have blueberry muffin rash covering his body and was transferred to NICU to rule out sepsis. Physical exam was within normal limit except for oval blueberry muffin like rash on patient scalp, face, back, feet and palm. The patient was diagnosed with neonatal lupus. Upon admission to NICU, labs showed platelet count of 34 with normal hemoglobin and white cell count. Thrombocytopenia worsened over the following two days requiring IVIG treatment. Response was minimal, and he was given second dose of IVIG and started on parenteral steroids. There was some concern from possible retinal hemorrhage prompting platelet transfusion. Pediatric ophthalmology thought the retinal hemorrhage was secondary to the birth process. The patient also had low tone initially which resolved with steroid treatment. EKG and echocardiogram returned normal. Prior to discharge, newborn screening results returned with a Trec of 9 (cutoff >26 Trec). A repeat screen was also positive. Lymphocyte phenotyping was drawn and immunology was consulted. At day 17 the patient was discharged home. Lymphocyte proliferation was normal to mitogens PHA, Con A and PWM (Table 1). FISH analysis of chromosome 22q11 was also normal, ruling out DiGeorge syndrome. Neonatal lupus and its therapy seems to have a deleterious effect on Trec production in the newborn.

Discussion

Neonatal lupus erythematosus (NLE) is an uncommon transplacentally-acquired autoimmune disorder. The most common clinical manifestations are skin rash, congenital atrioventricular block, thrombocytopenia, leukopenia, anemia, and hepatosplenomegaly.[4] Usually, the skin rash resembles subacute cutaneous lupus, but different, rarer, forms of rash have been reported. NLE should be suspected in babies with atypical skin lesions, even if present at birth.[1] Usually most of the NLE related rash resolve within the first few months of life.[5] Newborn screening for SCID with the TREC assay has been a resounding success in the US states in which it is currently being utilized.[6] This case identifies possible factors influencing the validity of newborn screening for SCID. This patient's positive Trec and immune dysregulation was likely a result of neonatal lupus and effect of maternal-derived autoantibodies.[2]

REFERENCES

1. **Gasparello-Almeida R, Feitosa-Oliveira SK**. Neonatal lupus erythematosus: an acquired autoimmune disorder and its cutaneous manifestations. *Isr Med Assoc J*. 2008 Jun;10(6):473-4. PubMed PMID: 18669151.
2. **Chen CM, Hsu YH**. Neonatal lupus erythematosus: a case report. *Gaoxiong Yi Xue Ke Xue Za Zhi*. 1992 May;8(5): 280-4. PubMed PMID: 1619705.
3. **McCallister T, Thompson R, Dunn ST**. Implementation of a Single-Wash, In-Situ, Real-time PCR Screening Procedure for Severe Combined Immunodeficiency in Oklahoma. Oklahoma State Department of Health, Oklahoma City, OK. Available from: https://www.aphl.org/ conferences/Documents/Posters-1-15.pdf
4. **Porcel Chacón R, Tapia Ceballos L, Díaz Cabrera R, Gutiérrez Perandones MT**. Neonatal lupus erythematosis: a five-year case review. *Reumatol Clin*. 2014 May-Jun;10(3):170-3. doi: 10.1016/j.reuma.2013.10. 005. Epub 2013 Dec 2. English, Spanish. PubMed PMID: 24296269.
5. **Savino F, Viola S, Tarasco V, Locatelli E, Ricagni A, Coppo P**. Neonatal lupus erythematosus: a cutaneous cases based update. *Ital J Pediatr*. 2016 Jan 7;42:1. doi: 10.1186/s13052-015-0208-5. PubMed PMID: 26743447; PubMed Central PMCID: PMC4705598.
6. Newborn Screening for Severe Combined Immunodeficiency Disorder. Secretary's Advisory Committee on Heritable Disorders in Newborns and Children. Available

from: http:www.hrsa.gov/advisortycommittees/mchbadvisory/heritabledisorders/recommendations/correspondence/combinedimmunodeficiency.pdf. Accessed January 24, 2016.

Table

MEDIA	PATIENT AVERAGE CPM	PATIENT STIM INDEX	CONTOL AVERAGE CPM	CONTROL STIM INDEX	REFERENCE CPM VALUE
	3169		463		
PHA(10.0 *mcg/ml CULTURE)*	67771	21	101333	219	›45000
PHA (5.0 *mcg/ml CULTURE)*	75972	24	116231	251	›25000
PHA(2.5 *mcg/ml CULTURE)*	89688	28	99649	215	›17000
CONA(25.0 *mcg/ml CULTURE)*	120609	38	56087	121	›13300
CONA(10.0 *mcg/ml CULTURE)*	69574	22	30915	67	›8830
CONA (5.0 *mcg/ml CULTURE)*	29617	9	15516	33	›3593
PWM(25 *mcg/ml CULTURE)*	42077	13	13698	30	›3800
PWM (8.3 *mcg/ml CULTURE)*	55115	17	27706	60	›3500
PWM (2.8 *mcg/ml CULTURE)*	48100	15	29999	65	›3000

Submitted June 22, 2018