

## **Case Report**

### **Noonan syndrome: ACTH induced hypertensive emergency**

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**Abstract:** Noonan syndrome, an autosomal dominant disorder affecting both sexes is characterized by dysmorphic features with cardiac malformations with seizures. However, association of infantile spasm with Noonan syndrome and more so ACTH induced hypertensive emergency in these patients is very rare. We hereby reported an infant who presented with dysmorphic features with refractory seizures and later developed hypertensive emergency due to ACTH therapy.

**Keywords:** Noonan, ACTH.

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#### **INTRODUCTION**

Noonan syndrome first described in 1963 affects 1: 2500 children world-wide is characterized by dysmorphic features in form of hypertelorism, webbed neck, low set ears, optic disc hypoplasia, congenital heart disease in form of pulmonary stenosis (50-60%), hypertrophic cardiomyopathy (12-35%), atrial septal defect (10-25%), ventricular septal defect (5-20%), mental retardation and seizure disorder (13%)[1].

#### **CASE REPORT**

9 months old infant came with complaint of difficulty in breathing since birth and cough and fever for last 10days. Baby was a product of non-consanguineous marriage born to 25 years old mother vaginally and there was no evidence of encephalopathy. Mother was complaining of difficulty in feeding with suck rest cycle noted since day 7 of life. For these respiratory complaints baby was evaluated and echocardiography was done which revealed moderate pulmonary stenosis at 2 weeks of age. There was no history of bluish discoloration, swelling over body. However, baby developed seizures at 1 month of age. Parents consulted physician and antiepileptic (phenytoin) was started. Except for EEG which was suggestive of abnormal electrical discharge rest of laboratory investigations were normal for age. Child was put on ACTH in view of possibility of infantile spasms suggested on the basis of EEG hypsarrythmic pattern and spasms with developmental delay. Fundus examination showed optic atrophy with pallor disc. Pt

was discharged after clinical response on valproate and ACTH (40 units/m<sup>2</sup>). After 2 months, patient again presented with complaints of cough, cough, fever and found to have raised blood pressure 130/110mm Hg and encephalopathy. Diagnosis of Hypertensive encephalopathy was kept and was started on nitroprusside infusion and other antihypertensive drugs (enalapril and prazosin) were added. ACTH was discontinued after once blood pressure was controlled. Baby again developed seizures for which levitracetam was also introduced. Plasma level of ACTH was significantly raised (90 pg/ml). Baby is now in follow up and is doing well with no hypertension.

On examination baby has weighing 4.5 kg and length was 58cm. Child had dysmorphic features in the form of hydrocephalus, hypertelorism, low set ears, AF wide open, low hair lin , webbed neck, extra pad of fat on shoulder. Systemic examination was normal except P2 was. ECHO done was suggestive of pulmonary stenosis (PS) with mitral regurgitation (MR) and tricuspid regurgitation (TR). ECG showed features of right axis deviation and right ventricular hypertrophy. USG Abdomen was normal, skull showed dilated ventricles and fundus examination showed optic atrophy. Kidney functions were within normal limits. There was no evidence of bleeding diathesis clinically as well laboratory-wise. In view of dysmorphic features with PS, a possibility of Noonan syndrome was kept and mutation study of father and mother were done,

father showed balanced translocation and confirmed the diagnosis.

## **DISCUSSION**

Noonan syndrome is characterized by dysmorphic features in form of hypertelorism, webbed neck, low set ears, optic disc hypoplasia, congenital heart disease in form of pulmonary stenosis, hypertrophic cardiomyopathy, atrial septal defect, ventricular septal defect, mental retardation and seizure disorder. This patient also presented with similar dysmorphic features with refractory seizures treated with ACTH therapy with a probable diagnosis of infantile spasm. Infantile spasms with developmental delay with abnormal neuroimaging in form of hydrocephalus have been reported in patients with Noonan phenotype [1]. ACTH therapy is well documented as first line treatment for treatment of infantile spasm and hypertension is well known side effect associated with ACTH therapy for last 2-3 decades and which is reversible when the therapy is weaned off. In a study by Raili Riikonen hypertension was documented in 65% of patients receiving ACTH therapy for infantile spasms [2]. However, there have been no case reports of hypertensive emergency caused by ACTH therapy in patients with infantile spasms and so in case of Noonan syndrome. Hypertrophic cardiomyopathy has been well documented in patients receiving corticotrophin treatment [3, 4]. It has been documented that myocardial changes occur before and during the development of systolic hypertension in these patients. Hence blood pressure monitoring is very much important in patients on ACTH therapy and a high suspicion of hypertensive encephalopathy should be kept even if a syndromic child came with encephalopathy specially when a patient is on ACTH therapy or drugs causing hypertension apart from other causes.

## **REFERENCES:**

1. Adachi M, Yu abe, Yoko Aki, Yoichi Matsubara; Epilepsy in RAS/ MAPK syndrome: two cases of cardio-facio-cutaneous syndrome with epileptic encephalopathy and a literature review, *Seizure*, 2012; 21: 55-60.
2. Raili Riikonen, Marta Donner; ACTH therapy in infantile spasms: side effects, *Archives of Disease in Childhood*, 1980; 55: 664-672.
3. Starc TJ, Bierman FZ, Pavlakis SG, Challenger ME, DE Vivo DC, Gersony WM; Cardiac size and function during adrenocorticotrophic hormone-induced systolic systemic hypertension in infants. *Am J Cardiol*, 1994; 73(1):57-64.
4. Bobele GB, Ward KE, Bodensteiner JB; Hypertrophic cardiomyopathy during corticotrophin therapy for infantile spasms. A clinical and echocardiographic study. *Am J Dis Child*, 1993; 147(2):223-5.