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PEARL SYNDROME WITH JACOB SYNDROME : A RARE ASSOCIATION

Neonatology

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ABSTRACT

The association of bilateral anotia or microtia with cardiac malformations is well known. One such association was reported by Pearl comprising of facial nerve palsy, anotia and congenital heart disease. It has been reported as a result of teratogenic effect of retinoic acid, thalidomide or as a variant of goldenhar syndrome. Jacob syndrome (47, XYY) is the second most common chromosomal disorder in males after klinefelters syndrome characterized by the presence of an extra Y chromosome. We present a case of unusual association of pearl syndrome with Jacob syndrome in a male neonate. To our best knowledge, till date no case with these comorbid conditions has been reported in English literature.

KEYWORDS

Pearl syndrome, Jacob Syndrome, male neonate.

INTRODUCTION

Absence or miniature form of external ear known as anotia or microtia is most commonly associated with congenital disorders like renal anomalies or short stature-small patella syndrome. Pearl in 1984 described the presence of anotia with facial palsy and congenital heart disease in two female patients, the triad now known as Pearl syndrome. Jacob syndrome is an aneuploidy of sex chromosomes where a male receives an extra Y chromosome resulting in 47, XYY chromosomes instead of 46, XY. It occurs in 1 in 1000 live born male individuals , although most of them are undiagnosed or diagnosed later in their life due to normal phenotype at birth[3]. There is no reported case in English literature reflecting the co-occurrence of these two syndromes in an individual. Therefore, we hereby report a case of this unusual association in a 16 days old male baby.

Case Report

A 16 days old male baby was referred from a private hospital with a diagnosis of dysmorphic features along with acynotic congenital heart disease and feeding difficulties. He was born at term to a primigravida mother through normal vaginal delivery and cried after stimulation. The apgar scores were 4 and 7 at 1 minute and 5 minutes. Baby had feeding problems and was referred to higher center for further evaluation and management.

On general physical examination he had right parietal cephalhae matoma, bilateral microtia, left side lower motor neuron type facial palsy, wide nasal bridge and retrognathia. Systemic examination – bilateral air entry was equal with no evidence of respiratory distress. On auscultation he had grade 4 pansystolic murmur at left lower sternal border. Abdominal examination was normal with no organomegaly. On CNS examination baby had poor cry and left side lower motor type facial palsy.(Figure. 1) Motor examination showed normal tone in all four limbs with normal movement of limbs. Moro's reflex was normal and symmetrical.

A 2-dimensional echo was done which revealed large perimembranous ventricular septal defect (VSD) with left to right shunt (20 mmHg gradient), tiny patent ductus arteriosus (PDA) with left to right shunt and small atrial septal defect with left to right shunt. Also, left pulmonary artery origin stenosis with gradient 28-30 mm Hg and mild right ventricular hypertrophy was noted. However, the ventricular function was normal. Pelvic and genital sonography showed bilateral undescended testis in inguinal canal with minimal coarsening of echotexture, the scrotum was empty and small in size.

MRI brain with MR angiography and MR venography was done which showed right cephalohematoma only. CT scan parietal bone revealed atresia of bilateral external auditory canal along with parietal bone atresia on left side. Head of mallei and short process of incii appeared dysplastic on both sides. Bilateral cochlea , cochlear ducts and semicircular canals were normal. Brainstem auditory evoked response (BAER) was planned to be done in follow up.

Ophthalmological evaluation showed no ophthalmologic abnormality. Sepsis work up was done twice, showed negative sepsis screen on both the occasions with blood culture sterile. His blood sugar, serum calcium and renal function tests were within normal range.

Based on the phenotypic findings of bilateral microtia, facial palsy and congenital heart disease a diagnosis of pearl syndrome was offered. Karyotype was done which showed presence of an extra Y chromosome which indicated the patient had 47XYY chromosomes instead of 46XY. (Figure. 2)

Thus, coming to a final diagnosis of unusual association of Pearl syndrome with Jacob syndrome.Mother had no history of exposure of retinoic acid, thalidomide or any other medication/radiation during pregnancy.

DISCUSSION

Abnormalities in auricular development in form of microtia or anotia can be found isolated or in association with various syndromes. Isolated cases are usually responsible for conductive hearing loss along with microtia / anotia. Inheritance of these cases is either autosomal dominant or multifactorial. The syndromic cases are associated with thalidomide embryopathy, retinoic acid embryopathy, trisomies, congenital viral infections like rubella, fetal alcoholic syndrome, Meir-Gorlin syndrome, diabetic embropathy, otomandibulofacial, a variant of Goldenhar syndrome etc[3]. Amongst these thalidomide embropathy, retinoic acid embropathy and variant of Goldenhar syndrome include triad of facial paralysis, congenital heart disease and microtia/anotia[4,5].On the contrary, Jacob syndrome (47XYY) was found in association of the present case.

Pearl described this triad of anotia, facial paralysis and congenital heart disease first in 1984. Cardiofacial syndromes described in literature are found to be commonly having 22q11 deletions however external auditory canal abnormalities are not a part of these syndromes[6]. Clinical exome sequencing was done in our case which showed no such deletion or pathogenic variation causative of reported phenotype. However additional findings showed duplications encompassing Y chromosome correlating with karyotype of XXY.

Jacobs syndrome (47XYY) involves an extra Y chromosome which results from parental non-disjunction during the second meiotic division. Individuals with Jacob syndrome (47XYY) usually have normal phenotype at birth and have no specific clinical features. This results in delayed diagnosis of these cases in adolescence or adulthood (mean age of diagnosis 17.1 years)[7-9]. At later age these individuals have tall height, personalty disorders, low intelligence quotient, infertility and psychiatric problems[8-10]. A study conducted by Lalatta on boys with 47XYY karyotype showed that they have specific facial phenotype involving the malar and ocular region. They also noted broad nasal bridge, low set ears, mild hypertelorism and mild flat malar region in these individuals[11]. The present case also had broad nasal bridge and retrognathia.

The present case had abnormal presentation at birth with triad of Pearl syndrome which unfolded the associated abnormal karyotype. No case till date has been reported with this unusual presentation. However, the etiology of occurrence of overlapping symptoms of Jacob and Pearl syndrome in the present case remains a mystery

To conclude, Pearl syndrome is not usually related with any abnormality in karyotype. The present case highlights the importance of karyotyping to be done in such case which lead to early diagnosis of Jacob syndrome. The early and timely diagnosis of Jacob syndrome, which is usually diagnosed at later age of life, is helpful for better management, counseling of parents for the outcomes of the disease in future.

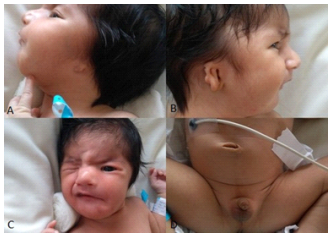

Figure 1. Clinical images (A). left anotia (B) right microtia (C) Asymmetrical crying facies due to left sided facial palsy (D) Small sized scrotal sac.

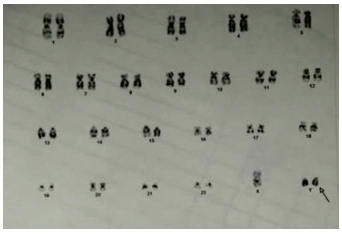

Figure 2. Karyotype showing extra Y chromosome (Arrow marked), 47, XYY.

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