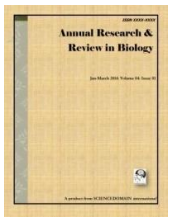

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Robert's Syndrome in an 8 Month Infant

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Authors' contributions

This work was carried out in collaboration between all authors. Author AS designed the study, wrote the protocol and final manuscript. Author MA gathered the initial data. Authors SK and MS managed the literature searches and gathered the photos. All authors read and approved the final manuscript

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Case Study

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ABSTRACT

Background: Robert's syndrome is an extremely rare autosomal recessive genetic disorder. The Gene of this syndrome is located on chromosome 8 and it is characterized by craniofacial anomalies and deformity in the limbs. Upper limbs are more involved compared to lower parts. In many cases thumb is involved. This syndrome is also called pseudo-thalidomide syndrome. The affected individuals are smaller pre and post natally, compared to others.
Case Presentation: Here an 8-month-old infant is introduced by prenatal and postnatal growth retardation accompanied by craniofacial and limb anomalies. For whom Robert's syndrome was diagnosed based on clinical and genetic findings.
Discussion: in infants born with craniofacial anomalies and limb deformities, Robert's syndrome is one of the options, which is extremely rare and only 150 cases are reported to now. Half of these are mentally retarded and they die in their childhood and their main death cause is not yet described.

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Keywords: Robert's; syndrome; anomaly; retardation.

1. INTRODUCTION

Robert's syndrome is a rare autosomal recessive disorder, which was described by John Robert's in 1919 in a male infant with bilateral cleft lip and tetra-phocomelia [1]. Formerly, most of the anomalies observed in infants were attributed to thalidomide intake, but this drug is not being used anymore. However, since the clinical manifestation of this syndrome is similar to anomalies created by thalidomide intake during pregnancy, this syndrome is also called pseudo-thalidomide syndrome [2] and probably in both cases, the chromosomal disorder is the same. In 1969, Hermann reported a case in which the parents were relatives. The father's first name started with S and the mother's with C. therefore, this syndrome was called S-C syndrome [3]. In 1995, Hugo Vega and Miriam Gordillo, two Colombian geneticists, realized that Robert's syndrome is characteristics by mutation of ESCO2 gene located on chromosome 8. This gene encodes a protein, which is required for correct separation of the chromosome during cell division and it plays an important role in creating the stick, which keeps the chromosome till they are ready to be divided [4]. Robert's syndrome affects both males and females equally [2,5,6]. Intrauterine growth retardation is frequent in this syndrome.

In some cases, there is renal and cardiac involvement in Robert's syndrome. The main eye involvement in Robert's syndrome is hypertelorism, but exophthalmos and corneal clouding may be present too. In Robert's syndrome, the hair is thin and sparse and it is silver blonde. Sometimes there is blood involvement as platelet decrease (thrombocytopenia).

After Robert's syndrome diagnosis, radiologic checking of the limbs, craniofacial and hand anomalies are required. In addition, ophthalmological evaluations, echocardiography, and kidney ultrasound should be conducted to perform required interventions if required. Close to 50% of the patients with Robert's syndrome are mentally retarded. Therefore, periodic follow-up should be done with regard to mental and brain function.

2. CASE PRESENTATION

A term boy infant, born through caesarean, was visited at the time of birth with limb anomalies. It was the first child of the family and his parents were distant relatives. The father was 30 and the mother was 27 years old, both healthy. There was no abortion or stillbirth history in the mother. She did not have any disease before or during pregnancy and has not taken any special drugs or has not been exposed to X-ray or chemicals. Congenital illness's history was negative in parent's families. Ultrasound conducted in week 34, the fetus was IUGR and amniotic fluid was reported lower than normal. At birth, the infant was 1600 g, 45 cm height and 27 cm head circumference, all of which were lower than 5 percentile. Weight, height and head circumference at 8th month are 5400 g, 54 and 36 cm respectively, all of which are lower than 3 percentile.

During examination, the infant was microcephal with blonde sparse hair. The anterior fontanelle has been closed by 3 months. Eyes were light gray and the pupils reacted to light without corneal clouding. However, hypertelorism was present. The nose bridge was flat and the nostrils were both open. There were no cleft lip or palate but high arched palate was seen. The philtrum was short, with small chin, short neck and ears bigger than normal (Fig. 1).

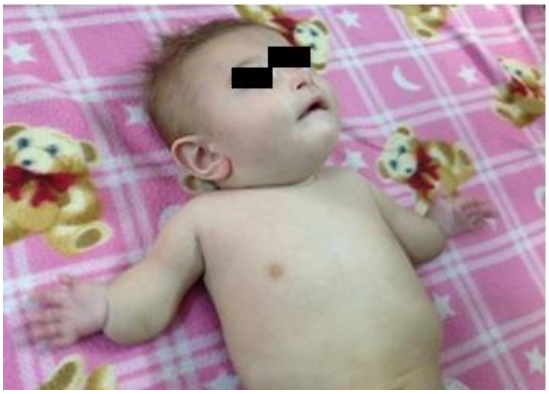

Fig. 1. In this image, hair is sparse and silver blonde, eyes are light gray, the chin is small and the palate is high arched. Upper limbs are short and there is thumb hypoplasia

There are deformities in upper and lower limbs (with higher intensity in upper limbs). Considerable shortness of upper limbs on both sides can be observed along with hypoplasia of the thumb. In lower limbs, the knees were in flexion contracture position, the distance between the first and second toes' is high (Fig. 2)

and there exist shortness in Achilles tendon, (Fig. 3). In the graph taken from the body the 12th ribs are not formed. In upper limbs, the arm bone is fully formed but there were no forearm bones on both sides. In lower limbs, the fibula bone was formed; the tibia bone was bent and slender. Epiphyses were round and hypoplastic (Fig. 4).

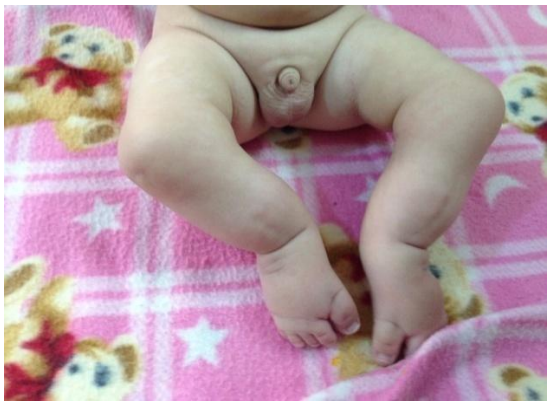

Fig. 2. Knees are in flexion position. There is curvature in the leg and distance between the first and second toes

In hand X-ray, the first metacarpal bone is not formed and the fourth and fifth metacarpals are fused together (Fig. 5).

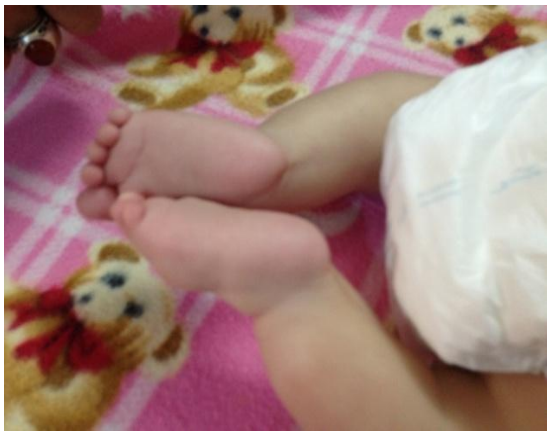

Fig. 3. Achilles tendon shortness is observed on both sides

In chest examination, there was distance increase between 2 nipples. Abdomen and genitalia examination was normal. Abdomen and kidneys' ultrasound was normal too. Echocardiography reported no problem. Neurological examination and developmental screening was natural and acceptable based on ASQ forms. Blood cells count (CBC) was done, which was normal and there were no decrease in any class of cells; the patient's karyotype was normal.

In brain CT without contrast, lissencephaly, schizencephaly, or structural problems of the brain were not seen However, there were skull sutures' fusion and craniosynostosis.

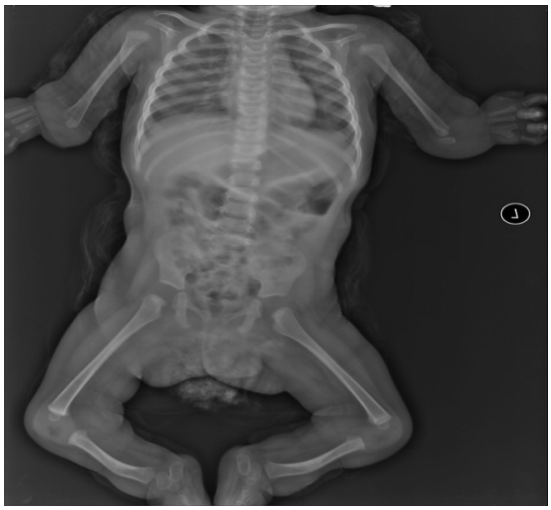

Fig. 4. In X-ray of the whole body, the absence of 12th ribs, forearm and fibula bones, tibia bone bowing, and round and hypoplastic epiphyses are observed

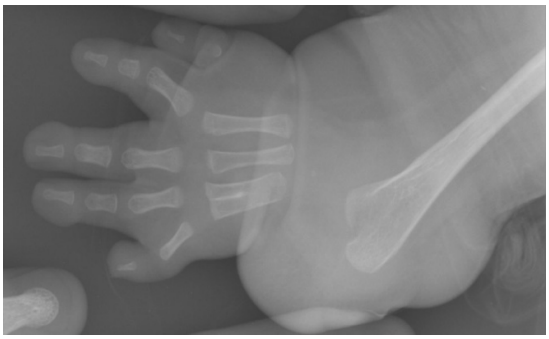

Fig. 5. In hand X-ray, the absence of first metacarpal bone formation and fusion of 4th and 5th metacarpals is observed

With regard to prenatal and postnatal retardation as well as craniofacial and limb anomalies, this infant was genetically screened, who was homozigot, with regard to Robert's syndrome and mutation in ESCO2 gene on 8P21 chromosome was reported, for which Robert's syndrome was diagnosed after considering clinical symptoms and genetic screening.

3. DISCUSSION

Robert's syndrome is an extremely rare genetic syndrome all around the world. To now, only 150 subjects are reported with this syndrome. This disease is autosomal recessive and affects both males and females equally. The responsible gene in this syndrome causes abnormality in mitosis phase and there is premature centromere separation, which is because of the rejection or the absence of tension between chromatids, it causes the premature separation of long chromatids arm in prophase or metaphase. Chromosomal abnormalities are present in half of the cases [7]. Limb anomalies may be present as the absence of one limb or developmental defect of that limb. Because of the similarities between this syndrome and manifestations resulted from thalidomide intake during pregnancy, it is called pseudo-thalidomide syndrome as well. In Robert's syndrome, there exists pre and postnatal retardation and sometimes its symptoms are observed in the ultrasound during pregnancy. In some cases, detailed ultrasound could assist the prenatal diagnosis, but verifying the diagnosis requires some checking; such as amniocentesis (weeks 15-18), cordocentesis (weeks 11-12) sampling the fetal cells (chorionic villus sample) and genetic checking. Of course, genetic checking is not routine, except in those families with genetic mutations and families with the history of a child with Robert's syndrome, detailed prenatal checking is required to have a healthy child later.

In many neonates with this syndrome, there is cleft lip and palate, which makes them prone to being effected by respiratory and ear infections and even hearing loss. Therefore, surgery of cleft lip and palate should be conducted at the right time and hearing should be evaluated periodically. Most of the infants with Robert's syndrome die in childhood but the exact cause of death is still unknown. There is no special treatment for this syndrome and often there are interventions, which improve their life quality, such as surgical correction of limbs and hands abnormalities, cleft lip and palate surgery to assist better nutrition and reduce recurrent otitis and hearing lass.

Craniositostosis, as a rare manifestation of Robert's syndrome, is regarded as differential diagnosis of Baller-Gerold syndrome [8].

Eylon et al. [9] and Al Kaissi et al. reported femoral-tibial sinostosis in two children with Robert's syndrome [6]. Developmental disorder of limbs along with femoral-tibial synostosis in Robert's syndrome is in differential diagnosis with TAR syndrome (Thrombocytopenia Absent Radii) and schinzel phocomelia syndrome.

Rabia et al. [2] reported Robert's syndrome in a 2 years old child with upper and lower limbs' anomalies along with bilateral agenesis of radius, ulna and fibula bones and fourth and fifth metacarpal fusion. The 8-month-old infant introduced in this study, had considerable prenatal and postnatal growth retardation. Face and head anomaly was manifested as microcephaly, small chin, short philtrum and neck, extreme shortness of upper limbs and the lack of first metacarpal radius and bilateral ulna bone formation, thumb hypoplasia, 4^{th} and 5^{th} metacarpal fusion tibia bowing and the lack of fibula bone formation and curved knees. Cranyosinostosis, which is a rare manifestation of Robert's syndrome, was present in this infant. Ultrasound screening of abdomen and pelvis, echocardiography and ocular examination were normal in this infant. In genetic screening, the report of mutation in ESCO2 gene on eighth chromosome, Robert's syndrome was diagnosed for this infant. Since his parents have decided to have another child, they were referred to genetics center for further tests.

CONSENT

The parents signed a case report consent for publication.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Robert's JB. A child with double cleft of lip and palate, protrusion of the intermaxillary portion of the upper jaw and imperfect development of the bones of the four extremities. Ann Surg. 1919;70:252.
2. Rabia A, Sahar W, Tahir M.A child with Robert's syndrome. Journal of the College of Physicians and Surgeons Pakistan. 2011;21(7):431-433.
3. Herrmann J, Feingold M, Tuffli G, Opitz J. A familial dysmorphogenetic syndrome of limb deformities, characteristic facial appearance and associated anomalies:

The 'pseudothalidomide' or 'SC-syndrome. Birth Defects Orig Art Ser. 1969;3:81-89.

4. Vega H, Waisfisz Q, Gordillo M, Sakai N, Yanagihara I, Yamada M, et al. Robert's syndrome is caused by mutations in ESCO2, a human homolog of yeast ECO1 that is essential for the establishment of sister chromatid cohesion. Nat Genet. 2005;37:468-70.
5. Temtamy SA, Ismail S, Helmy NA. Robert's syndrome: Study of four new Egyptian cases with comparison of clinical and cytogenetic findings. Genet Couns 2006;17:1-13.
6. Al Kaissi A, Robert C, Klaushofer K, Grill F. Femoral-tibial –synostosis in a child with Robert's syndrome (pseudothalidomide): A case report. Cases J. 2008;1:109.
7. Fryns J, Goddeeris P, Moerman F, Herman F, Berghe H. The tetraphocomelia-cleft palate syndrome in identical twins. Hum Genet 1980;53:279-281.
8. Huson SM, Rodgers CS, Hall CM, Winter RM. The Baller-Gerold syndrome: Phenotypic and cytogenetic overlap with Robert's syndrome. J Med Genet. 1990;27:371-375.
9. Eylon S, Beeri M, Joseph K, Meyer S. Femoro-tibial ankylosis in a child with Robert's syndrome: An "aggressive" approach to habilitation. J Pediatr Orthop. 2007;27(8):926-929.

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