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Case Report

Ring chromosome 15 presenting as short stature, intellectual disability and café-au-lait spots

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ABSTRACT

Ring Chromosome 15 results from loss of genetic material from both ends of chromosome 15 and joining of the ends to form ring. Only 50 cases are reported in literature with none from India. We report a case of 17 years old female approached us for short stature and low intelligence. On examination we noticed childish facial features, microcephaly and cafe-au-lait spots in significant number and size. Her karyotype result was 46xx r15. CONCLUSION: Ring chromosome 15 syndromes should be considered in a case having short stature with cafe-au-lait spots. Timely recognition and hereditary tendency counselling is required.

Keywords: Café-au-lait spots, Low intelligence, Ring chromosome 15, Short stature

INTRODUCTION

Ring chromosome 15 (r(15)) syndrome is an uncommon chromosome anomaly first described by Jacobsen in 1966.[1] Only 50 cases of ring chromosome 15 are reported in literature with none from India.[2] Growth deficiency, mental retardation and congenital malformation were common phenotypes.Congenital malformations included eye anomalies (e.g. macular defects, hyperopia, strabismus and heterochromia), ear abnormalities (e.g. dysplastic ears and hearing loss), café-au-lait macules and cardiac anomalies.[2,3] However, it was still unclear whether these manifestations were really associated with r(15) as it was so rarely reported. So we are reporting this rare condition.

CASE REPORT

A 17 yrs old adolescent female approached us for short stature and low intelligence. She was first in birth order, born of non-consanguineous marriage. The younger male sibling was normal. Her birth weight was 1.25 kg as told by parents with term gestation. Antenatal history was insignificant. Mid Parental height was normal. At the time of presentation her height was 126.5 cm and weight 27.2 kg. Upper segment and lower segment ratio was 1.05:1 with arm span of 125 cm. Her height was <-3SD for age and sex. Head circumference was 45.5cms. She was studying in 8th standard with poor school performance. She had menarche at age of 15 years and at present she was in SMR stage 4. On detail physical examination she had childish facial features, microcephaly with significant number and size of café-aulait spots all over body. She had no features suggestive of congenital heart defect, webbed neck, cubitus valgus, shielded chest, simian crease, clinodactyly etc. Ultrasound of abdomen showed uterus, ovaries and adenexa normal for her age.

At first she was investigated for short stature. Her investigations revealed hypothyroidism with normal IGF-1 and IGFBP-3(CLIA Method). Her bone age was less

than chronological age. She was started on thyroxine 50 microgram. Meanwhile her blood sample was sent for karyotyping. Cytogenetic study was done with GTG Banding with trypsin and Giemsa with 450-550 band pattern (ISCN).

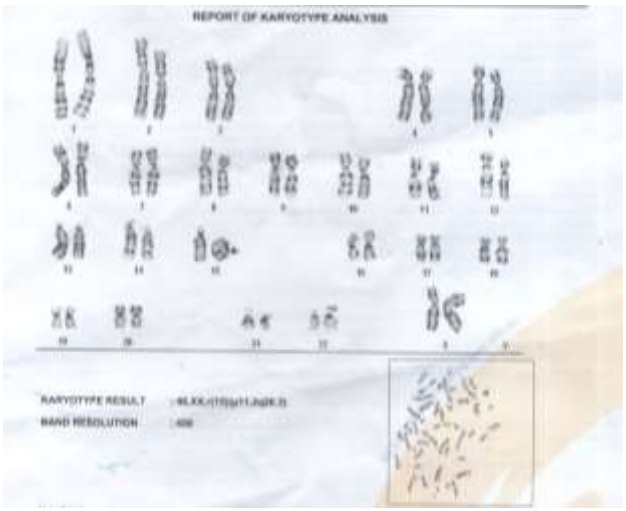

Figure 1: Karyotype analysis of the patient.

Figure 2: Childish facial features, significant number and size of café-au-lait spots all over body).

Her karyotyping result was 46 xx r15 p11.2 q26.3. The segments distal to breakpoint were deleted. No mosaicism was detected. Parental karyotype was not done due to financial aspect.

DISCUSSION

Ring chromosome 15, first described by Jacobson in 1966, is a rare genetic disorder.[1] A ring chromosome is formed when both ends of a chromosome are deleted and the ends are then joined to form a ring. Depending on the amount of chromosome material that is lacking or in excess (if the ring is in addition to the normal chromosomes), a patient with a ring chromosome can appear normal or nearly normal or can have intellectual disability and multiple congenital anomalies.[4]

Ring 15 chromosome presents mainly as antenatal and perinatal growth retardation, continuing till childhood, learning and speech delay with microcephaly. Few cases may have hypotonia, heart defect, club foot, cryptorchidism; triangular facies with wide eyes unusual shaped ears, broad nasal bridge, short hands and fingers, clinodactyly and pigmented patches on skin (café-au-lait spots). Mosaic children may have less severe involvement.[3,5]

Effect on growth is due to loss of particular gene called IGF-1r near the end of long arm of chromosome 15. More proximal the defect, severe the retardation.[2,5]

Other causes of café-au-lait spots with mental retardation are Russell silver syndrome (RSS), tuberous sclerosis, fanconi anemia, ataxia telangiectasia and McCune Albright syndrome which are excluded by clinical signs and symptoms. RSS and Chromosome 15 Ring may share several features, including growth retardation and short stature, a triangular-shaped face, finger abnormalities, cafe-au-lait spots, and other abnormalities. Certain features are typically more marked in those with Chromosome 15 Ring, such as mental retardation, smallness of the head and other facial abnormalities, congenital heart defects, and digital malformations. Thus, the presence of such findings in association with RSS features should lead to chromosomal analysis to help confirm or exclude the presence of Chromosome 15 Ring.[6]

CONCLUSION

Ring chromosome 15 syndrome should be considered in cases having short stature and mental retardation with cafe au lait spots. Timely recognition and hereditary tendency counselling is required.

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REFERENCES

1. Jacobsen P. A ring chromosome in the 13-15 groups associated with microcephalic dwarfism, mental retardation and emotional immaturity. Hereditas 1966;55:188-91.
2. Glass IA, Rauen KA, Chen E, Parkes J, Alberston DG, Pinkel D, et al. Ring chromosome 15: characterization by array CGH. Hum Genet. 2006;118:611-7.
3. Butler MG, Fogo AB, Fuchs DA, Collins FS, Dev VG, Phillips JA 3rd. Two patients with ring chromosome 15 syndrome. Am J Med Genet. 1988;29:149-54.
4. Bacino CA, Lee B. Abnormalities of chromosome structure. In: Robert M. Kliegman, Bonita F. Stanton, Joseph W. St Geme, Nina F. Schor, editors.

Nelson textbook of paediatrics, 20th edition. Philadelphia: Saunders, Elsevier. 2016:620.
5. Tumer Z, Harboe TL, Blennow E, Kalscheuer VM, Tommerup N, Brondum-Nielsen K. Molecular cytogenetic characterization of ring chromosome 15 in three unrelated patients. Am J Med Genet. 2004;130A:340-4.
6. Chromosome 15 Ring. Nord. http://rarediseases.org/ rare-diseases/ chromosome-15-ring/.

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