

A MIDDLE AGED WOMAN WITH MOSAIC TURNER SYNDROME: A CASE REPORT

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Abstract

Turner syndrome is a disorder of females is characterized by the absence of all or part of a normal second sex chromosome. Turner syndrome occurs in 1 in 4000 live-born girls and approximately 5 to 10 percent of them have mosaic isochromosome 45,X/46,X,i(Xq).

Turner syndrome is associated with reduced adult height and with gonadal dysgenesis, leading to insufficient circulating levels of female sex steroids and to infertility. Osteoporosis and high risk of fractures are features in adults with Turner syndrome.

In this study, we present a delayed case of Turner syndrome with primary amenorrhea, short stature, osteoporosis and high risk of fractures. This case has ignored due to social and economic conditions, therefore we think that the patient can be considered for publication.

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Introduction

Turner syndrome, a disorder of females is characterized by the absence of all or part of a normal second sex chromosome, leading to a constellation of physical findings that often includes congenital lymph edema, short stature, and gonadal dysgenesis.^{1,2,3}

Turner syndrome occurs in 1 in 4000 live-born girls. The most frequent chromosome constitution in Turner syndrome is 45,X without second sex chromosome. However, about 50 percent of cases have other karyotypes. About one quarter of Turner syndrome cases involve mosaic karyotypes, in which only a proportion of cells are 45,X. The most common karyotypes and their approximate relative prevalences are as follows; 50 percent of cases 45,X, 15 percent of cases 46,X,i(Xq), 15 percent of cases 45,X/46,XX, about 5 percent of cases 45,X/46,X i(Xq), about 5 percent of cases 45,X, other X

abnormality and about 5 percent of cases other 45,X/? Mosaics.^{1,2,4}

Osteoporosis, reduced volumetric bone mineral density (vBMD), and an increased risk of fracture have been reported as features of Turner syndrome (TS) not only in adults but also in children. Osteoporosis may result from an inherited bone structure defect associated with other skeletal and connective tissue anomalies of the syndrome or, more likely, from estrogen deficiency. Estrogen replacement and treatment of short stature with GH were reported to optimize bone mass in Turner syndrome girls.^{5,6}

It will be reported a delayed case of Turner syndrome with primary amenorrhea, short stature, osteoporosis and high risk of fractures. This case has ignored due to social and economic conditions, therefore, we think that the patient can be considered for publication.

Case Report

A 39 years old patient with primary amenorrhea was referred to Dicle University Medical Faculty Department of Genetics for karyotype analysis. According to information of her family; as his father's second marriage. She had five brothers and four sisters. She belonged to a very poor socioeconomic background.

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On gynecologic and ultrasound examination of the patient that was performed in the department of obstetrics and gynecology by the gynecologist vaginal development was normal. 54x31cm size of uterus and ovaries could not be evaluated. Pelvic MRI also revealed the same. She was short statured with 136cm in height and 40kg in weight. She had not attained menarche. Development of her breasts was infantile. Her pubic and axillary hair was infantile.

The measurement of hormone level revealed an increase in the FSH level 95,9 mIU/ml, LH level 21,42 mIU/ml, estradiol level was low that 5 mIU/ml. The measurement of the other hormones level were found as 2,97pmol/L for plasma TSH level, 5,71 pmol/L for T3 level, 15,26 pmol/L for T4 level, 4,22ng/ml for prolactin level, 14,98 µg/dL for cortisol level, 57,25pg/mL for PTH level and 3,14pg/mL for ACTH level.

Higher fracture risk and osteoporosis was evaluated for femur on whole body bone densitometry of the patient. Also the patient was complaining about hearing impairment. Audiologically findings of the patient; with very mild symptoms in the left ear and mild hearing loss mixed type in the right ear.

The chromosomal analysis done by Peripheral Blood Lymphocyte Culture and G-banded. Chromosome analysis was performed on 100 metaphase plate and mosaic 45,X[%66] / 46,X,i(Xq)[%34] karyotype was detected (Figure 1 and 2).

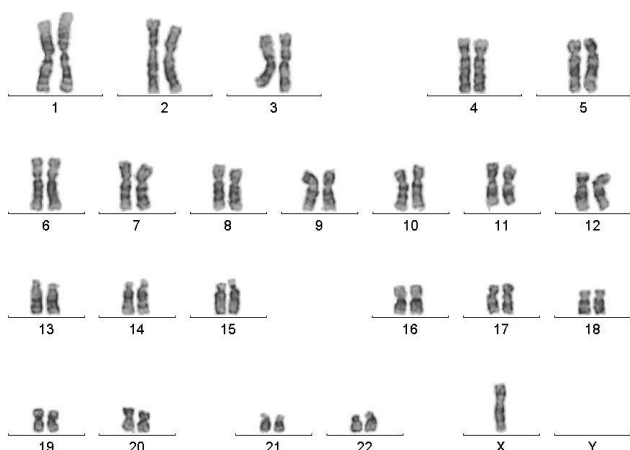


Figure 1. Karyotype showing 45,X chromosomal complement.

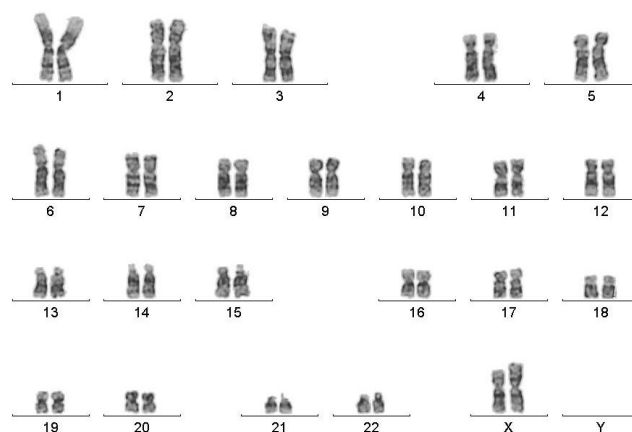


Figure 2. Karyotype showing 46,X,i(Xq) chromosomal complement.

Materials and methods

We obtained chromosome preparations from routine peripheral blood lymphocyte cultures. At least five GTG banded metaphases (minimal 500 band level) were evaluated for couple. Karyotypes were recorded according to The Recommendations of The International Standing Committee on Human Cytogenetic Nomenclature 2000.

Peripheral blood cultures were set up in F-10 nutrient media and with 20% fetal bovine serum. The cultures were stimulated with phytohaemagglutinin (PHA-M) and incubated for 72h at 37 ° C. The cultures were arrested with colchicine (10 mg/ml) at 70,5th h and treated with 0.075 M KCl. The cultures were fixed with cornoy fixative (methanol: Acetic acid, 3:1).

The chromosomes were prepared on prechilled slides and stored for three days at room temperature for ageing of the slides. The chromosome preparations were subjected to GTG-banding using standard procedure. Briefly, the slides treated with trypsin-EDTA in Sorensen's buffer for 30 seconds and stained with giemsa stain. At least 100 well-spread and banded metaphases were analyzed under microscope and karyotyped according to ISCN 2000.

Discussion

Two pathogenic mechanisms, which have been described in the literature, lead to monoclonal monosomy X: meiotic non-disjunction and chromosomal lag or loss.

The incidence rate of 45,X in spontaneous abortions is high. This single abnormality is present in an estimated 1 to 2 percent of all conceptuses; survival to term is a rare outcome, and more than 99 percent of such fetuses abort spontaneously.

The single X is maternal in origin in about 70 percent of cases; in other words, the chromosome error is usually paternal. The basis for the unusually high frequency of X or Y chromosome loss is unknown. Furthermore, it is not clear why the 45,X karyotype is usually lethal in utero but is apparently fully compatible with postnatal survival. The missing genes responsible for the Turner syndrome phenotype must reside on the X and Y chromosomes. It has been suggested that the responsible genes are among those that escape X inactivation.

The basis for isochromosome formation is not precisely known, at least two mechanisms have documented: mid-division through the centromere in meiosis II and, more commonly, exchange involving one arm of a chromosome and its homolog at the proximal edge of the arm, adjacent to the centromere.¹

The Xq isochromosome is associated with autoimmune disorder but not congenital abnormalities. The clinical picture of Turner syndrome varies from case to case.⁷

Phenotype is not well predicted by genotype, particularly in the case of mosaicism. This is particularly true of the various mosaicisms when the picture depends on the ratio of the different cell populations and their distribution in various tissues and organs.⁸

Hearing loss and middle ear diseases are often reported in some of patients with Turner syndrome. Hearing loss in women with Turner syndrome is not clinically apparent in most of the cases; this fact reflects the need of early evaluation and further monitoring of hearing organ in those patients.^{2,9,10,11}

Parkin and Walker recommended that Turner Syndrome is associated with a high incidence of middle ear disease so, individuals with Turner syndrome should be screened for onset and progression of hearing loss.¹⁰

Several authors have documented an association between Turner Syndrome and an increased risk of fracture in patients with Turner Syndrome. Although these researchers recommended in their clinical studies that Estrogen supplementation is essential to improve

BMC (**Bone Mineral Density**) accrual during growth in Turner syndrome.^{5,6,12}

Kannan TP et al. reported that the delay in the diagnosis of Turner syndrome in their studies could be attributed to the lack of antenatal screening and early neonatal screening.

The institution of societies and referral centers to cater exclusively to the needs of the Turner syndrome patients will also help them seek advice and improve their outlook towards the society. Hence, establishing early diagnosis, educating and increasing awareness among doctors, as well as prenatal diagnosis, would be an effective measure in alleviating the social trauma related to Turner syndrome patients in their population.⁸ Also, some researchers emphasized that the importance of delay in the diagnosis of Turner syndrome.^{2,13}

Conclusions

Early diagnosis will enable early intervention and early psychological counseling to the patient as well as the parents, which in turn will help enhance their quality of life.

Declaration of Interest

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