

Premature ovarian aging in primary infertility: Triple X syndrome

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ABSTRACT

Genetic aberrations comprise one-third of women with premature ovarian aging (POA). X chromosome abnormalities are seen in these women. We report a case of a 29-year-old lady with primary infertility and POA. She was phenotypically normal and her basal follicle stimulating hormone level was above the age-specific cut-off. Karyotype was triple X syndrome.

KEY WORDS: Karyotype, premature ovarian aging, triple X syndrome

INTRODUCTION

Menopause before 40 years is premature ovarian failure (POF). Premature ovarian aging (POA) is defined by elevated age-specific basal follicle stimulating hormone (FSH) cut-off levels with menstruation. The age-specific cut-off level under the age of 33 years (our patient's age) is 7.0 mIU/ml.^[1]

POA accounts for 9% of all women (nine times more than POF).^[2] There are four main causes for POF, namely, idiopathic, genetic, autoimmune, and viral causes.^[3] Can we extend causes of POF to POA? If causes are similar and we evaluate women for POA, can we delay the process of POF? With these thoughts, we evaluated this patient and we are reporting the case.

A study by Gleicher *et al.* titled "Do the etiologies of POF and POA same?" concluded that presumed underlying etiologies of POA follow a similar distribution pattern as reported for POF. They proved the hypotheses that POA is a precursor stage of POF and hence requires similar evaluation.^[2]

CASE REPORT

A 29-year-old lady presented to us for the evaluation of primary infertility. She was married for 2 years. She had oligomenorrhea and menstruated once in 3 months since 1 year. She had an elevated basal FSH level of 28 mIU/ml 3 months back. Her height

was 1.68 m and she weighed 50 kg with a body mass index of 19 kg/m². She was not diabetic and there was no family history of autoimmune disorders. She did not have any symptoms or signs of an autoimmune disorder. Systemic and pelvic examinations were normal. A transvaginal ultrasound scan showed a normal-sized uterus but ovaries were not visualized. The ESR was 5 mm/h and platelet count was 230000/cumm. The thyroid function test and blood sugars were normal. The repeat basal FSH level (after 6 weeks) was 27 mIU/ml. Since the basal FSH level was above the age-specific cut-off level (7 mIU/ml for 33 years of age), diagnosis of POA was considered and karyotype was requested. The report was triple X syndrome [Figure 1].

DISCUSSION

Our patient is a case of POA with triple X syndrome. The incidence of triple X syndrome is 0.65 per 1000 liveborn female infants. They are phenotypically normal apart from being taller than average.^[4] Jacobs *et al.* described the first association of triple X syndrome with POF in 1959.^[5] A total of 21 cases of POF with triple X syndrome have been reported in the literature, but to the best of our knowledge, this is the first case report of POA with triple X syndrome.^[6]

Genetic causes comprised approximately 16% of the total in the study conducted by Gleicher *et al.* Both autosomes and

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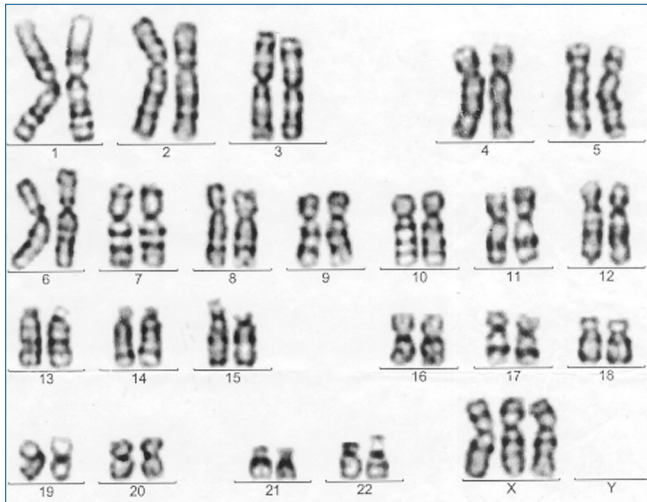


Figure 1: Report of triple X syndrome

X chromosomal involvement are documented. They are Turner mosaicism, partial X chromosome deletion, X chromosome mosaicism, X chromosome inactivation, and FMR 1 (fragile site mental retardation X gene). X chromosome partial deletions are more common, while balanced X chromosome to autosome translocation of Xq13–q26 is rare, but documented.^[3] Autosomes involved are at the following gene loci: 3q, 13q, 14q, 17q, 15q, and 11p.^[2]

Genetic defects are proposed to cause POA and POF by increasing atresia of ovarian follicles due to apoptosis or failure of follicle maturation and thus decreasing the pool of primordial follicles.^[3]

Triple X syndrome women also suffer from psychiatric disorders like schizophrenia, EEG abnormalities, scoliosis, and genitourinary malformations.^[6] Our

patient did not suffer from any of the above-mentioned abnormalities.

POA with triple X syndrome and primary infertility is treated with ovulation induction by gonadotrophins, because of elevated basal FSH values. Prenatal diagnosis for pregnant women with triple X syndrome is definitely required as there will be 25% chance of X chromosomal abnormalities in the offspring. Whether these patients are prone for recurrent abortions is unknown.

Hence, we conclude that it is essential to consider karyotyping for all cases of POA, and age-specific basal FSH values will help us detect cases of POA.

REFERENCES

1. Barad DH, Weghofer A, Gleicher N. Age-specific levels for basal follicle-stimulating hormone assessment of ovarian function. *Obstet Gynecol* 2007;109:1404-10.
2. Gleicher N, Weghofer A, Oktay K, Barad D. Do etiologies of premature ovarian ageing (POA) mimic those of premature ovarian failure (POF). *Hum Reprod* 2009;24:2395-2400.
3. Goswami D, Conway SG. Premature ovarian failure. *Hum Reprod Update* 2005;11:391-410.
4. Kingston HM. ABC of clinical genetics. *BMJ* 1989;298:813-6.
5. Jacobs P, Baikie AG, Brown WM, MacGregor TN, Maclean N, Harnden DG. Evidence for the existence of the human super female. *Lancet* 1959;2:423-5.
6. Otter M, Constance TR, Schrandt S, Leopold MG. Triple X syndrome: A review of the literature. *European J Hum Genetics* 2010;18:265-71.

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