Background: Chromosomal abnormalities have long been recognized as a cause of abnormal sexual development, recurrent pregnancy loss, infertility, menstrual cycle disorders, and premature ovarian insufficiency (POI). Genetic causes of menstrual cycle disorders and POI can either be chromosomal or caused by single genes, involving the X chromosome or autosomes. The X chromosome abnormalities represent 13% of the cases, followed by the FMR1 gene premutation that represents 6% of the cases. They lead to ovarian follicle dysfunction and/or their depletion.
We evaluated the contribution of X chromosome abnormalities in women with sporadic idiopathic POI.

Material and methods: Our study included 319 women with menstrual cycle disorders (sporadic idiopathic POI or secondary amenorrhea) referred to our Department of Obstetrics and Gynaecology in the period between 2000 and 2014. The diagnosis of POI was based on the criteria of either at least 6 months of amenorrhea or the age of menopause less than 40 years, combined with two consecutive values of serum follicle stimulating hormone (FSH) higher than 40 IU/l. Women with primary amenorrhea or gonadal dysgenesis, FRAXA permutation, mutations in the FOXL2 or inhibin INHα genes were excluded.

Results: Chromosome abnormalities were found in 62 (19.4%) women with POI. Twenty-six patients (26/319, 8.1%) had true X chromosome mosaicism; and 28 patients (28/319, 8.7%) had low-level X mosaicism.

Conclusions: The results show that X aneuploidy and low-level mosaicism have reproductive significance in the phenotypically normal women with sporadic idiopathic POI with practical implications for genetic counseling and fertility treatment. According to them, as well as ESHRE guidelines, cytogenetic analyses should be considered for all women with unexplained sporadic noniatrogenic POI.