

Prevalence of the Polymorphism *MTHFR* A1298C and not *MTHFR* C677T Is Related to Chromosomal Aneuploidy in Brazilian Turner Syndrome Patients

perspectives

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ABSTRACT

Background: Dysfunctions in the folate metabolism can result in DNA hypomethylation and abnormal chromosome segregation. Two common polymorphisms of this enzyme (C677T and A1298C) reduce its activity, but when associated with aneuploidy studies the results are conflicting. The objective of the present study is to analyze the *MTHFR* gene polymorphisms in women with Turner Syndrome and in a control group, correlating the findings to the chromosomal aneuploidy. **Methods:** The study comprised 140 patients with Turner Syndrome, of which 36 with chromosome mosaicism and 104 non-mosaics, and a control group of 209 fertile and healthy women without a history of any offspring with aneuploidy. Polymorphisms C677T and A1298C were studied by RFLP-PCR and the results were statistically analyzed. **Results:** The frequency of genotypes *MTHFR* 677CC, 677CT and 677TT in the patients with Turner Syndrome and chromosome mosaicism was, respectively, 58.3%, 38.9% and 2.8%. Among the patients with non-mosaic Turner Syndrome, 47.1% presented genotype 677CC, 45.2% genotype 677CT, and 7.7% genotype 677TT. Among the 209 individuals of the control group, genotypes 677CC, 677CT and 677TT were found at the following frequencies: 48.3%, 42.1% and 9.6%, respectively. As for polymorphism A1298C, the patients with Turner Syndrome and chromosome mosaicism presented genotypes 1298AA, 1298AC and 1298CC at the following frequencies: 58.3%, 27.8% and 13.9%, respectively. Among the non-mosaic Turner Syndrome patients, genotype 1298AA was found in 36.5%, genotype 1298AC in 39.4%, and genotype 1298CC in 22.1%. In the control group, genotypes 1298AA, 1298AC and 1298CC were present at the following frequencies: 52.6%, 40.7% and 6.7%, respectively. **Conclusion:** No correlation was observed between the *MTHFR* gene polymorphism 677 and chromosomal aneuploidy in the Turner Syndrome patients. However, the *MTHFR* gene polymorphism at position 1298, mainly genotype 1298CC that reduces the enzyme efficiency, was more frequent in the group of Turner Syndrome patients, suggesting its involvement in mechanisms related to chromosomal imbalances. (*Arq Bras Endocrinol Metab* 2008; 52/8:1374-1381)

Keywords: Turner syndrome; *MTHFR* gene; Polymorphism; Aneuploidy; Chromosomal imbalance

RESUMO

A Prevalência do Polimorfismo A1298C e não do C677T do Gene *MTHFR* está Relacionada à Ocorrência de Aneuploidias Cromossômicas em Mulheres Brasileiras Portadoras da Síndrome de Turner.

Introdução: Disfunções no metabolismo dos folatos podem resultar em hipometilação do DNA e na segregação cromossômica anormal. Dois polimorfismos comuns no gene *MTHFR* (C677T e A1298C) reduzem a atividade da enzima e, quando associados a estudos de aneuploidias apresentam resultados conflitantes. O objetivo do presente estudo foi a análise dos polimorfismos do gene *MTHFR* em mulheres portadoras da síndrome de Turner

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