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Hyperhomocysteinemia in men and women of married couples with reproductive disorders. What is the difference?

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Abstract

Hyperhomocysteinemia (HHcy) is an autosomal recessive inherited metabolic disease caused by variations in folate metabolism genes, characterized by impaired methionine metabolism and accumulation of homocysteine (Hcy) in the blood serum. It was shown that men usually have higher plasma Hcy levels than women, but have not yet assessed the leading factors of these differences, which is important for the development of personalized protocols for the prevention of folate metabolism disorders in couples with reproductive disorders. This study aimed to analyze the effect of intergenic and gene-factor interactions on the risk of developing HHcy in men and women of married couples with reproductive disorders. In our study were involved 206 married Caucasian couples (206 males and 206 females) from central regions of Ukraine with early pregnancy losses in the anamnesis. We found that the incidence of HHcy in men was significantly higher than in women. Gender differences in folic acid and vitamin B12 levels were identified. The best predictors of HHcy in men (MTRR (A66G), MTHFR (C677T), MTR (A2756G), vitamin B12 level) and in women (MTHFR (C677T), MTR (A2756G), vitamin B12 level) were selected by binary logistic regression. There was no significant difference in the distribution of genotypes by the studied gene variants when comparing men and women with HHcy. Our findings demonstrate that there is a gender difference in the development of HHcy. This difference is caused by intergenic interaction and by environmental factors, in particular, nutrition and vitamins consumption.

Keywords: Hyperhomocysteinemia; folate cycle; gender; gene; reproductive disorders.