Association of gene polymorphism methylenetetrahydrofolate reductase cytosine-to-thymidine substitution at nucleotide 677 with cardiovascular and metabolic risk in morbidly obese patients

KEYWORDS: methylenetetrahydrofolate reductase, hypertension, diabetes.


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Patients and Methods: We included 88 patients from a multidisciplinary weight management program in which genetic analysis on MTHFR gene polymorphism was tested. Patients were divided in 3 groups: 36 patients with MTHFR C677T healthy genotype CC (27 women, 9 men; age 46.4±10.1 year; BMI 44.9±8.8 kg/m²), 38 patients with MTHFR C677T heterozygous mutation CT (27 women, 11 men; age 46.9±11.4 year; BMI 44.6±6.5 kg/m²), 14 patients with MTHFR C677T homozygous mutation TT (12 women, 2 men; age 50.1±15.5 year; BMI 40.2±6.9 kg/m²). In each group the incidence of hypertension, prediabetes, diabetes and obstructive sleep apnea (OSA) was determined.

Results: Patients with genetic mutation MTHFR C677TCT (Figure 1) had the highest incidence of arterial hypertension (65.8%), diabetes (18.4%), prediabetes (18.4%) and OSA (31.6%) with the highest average apnea hypopnea index (AHI) of 17.3±24.7, even 13.2% of patients used continuous positive airway pressure (CPAP). Patients with healthy genotype MTHFR C677TCC had lower incidence of arterial hypertension (44.4%), prediabetes (11.1%), diabetes (13.9%), OSA (25%), average AHI 11.3±15.9 and only 8% of patients used CPAP. Patients with MTHFR C677TCTT polymorphism had the lowest arterial hypertension incidence (42.9%), the highest prediabetes incidence (42.9%), middle OSA prevalence (28.6%), AHI 7.7±7.6.

Conclusion: MTHFR C677TCT polymorphism is the most common gene polymorphism in our group of morbidly obese patients. MTHFR C677TCT polymorphism compared to MTHFR C677TCC and MTHFR C677TCTT polymorphisms carries the highest risk for arterial hypertension, metabolic disorders (diabetes) and obstructive sleep apnea. Homozygotes MTHFR C677TTT carries the highest risk for prediabetes. Further investigation is needed to explore this correlation.

LITERATURE

