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ASSOCIATION OF METHYLENETETRAHYDROFOLATE REDUCTASE POLYMORPHISM C677T WITH HYPERTENSION DEVELOPMENT

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Introduction: The Methenyltetrahydrofolate reductase enzyme (MTHFR) converts 5,10-methenyltetrahydrofolate to 5-methyltetrahydrofolate, a fundamental step in S-adenosylmethionine formation from S-adenosylhomocysteine. The substitution C®T (C677T) in the gene of MTHFR (1p36.3) expresses an enzyme variant, thermolabile and with low activity, that may be related with the hypercisteinemia development.


Population: The association study of C677T MTHFR polymorphism was done in a population with 142 individuals with Hypertension (81 with stage II hypertension (HT-II) and 61 with stage III hypertension (HT-III)), and a control population with 141 individuals with no history of hypertension or diabetes.

Results: The genotype frequencies of C677T MTHFR polymorphism for the hypertensives were CC- 0.620, CT- 0.345, and TT- 0.035, and for controls were CC-0.546, CT- 0.312, and TT- 0.142 (p<0.008). The allelic frequency for hypertension was C- 0.792 and T-0.208, and for controls C- 0.702 and T- 0.298 (p<0.02).

Separating the individuals by the type of hypertension we disclosed that the genotype frequencies distribution in the 3 populations were different HT-II (CC-0.444; CT- 0.506; TT- 0.050) vs. controls (p<0.007) and HT-III (CC-0.689; CT- 0.295; TT- 0.016) vs. controls (p<0.0001). The allelic frequencies for HT-II were C- 0.698 and T- 0.302, and for HT-III were C- 0.836 and T- 0.164.

Conclusions: The hypertensive population when compared with the controls showed a significantly higher frequency of TT individuals in the control group. Our results don’t associate the TT genotype with a predisposition for hypertension development. Some studies associate the TT homozigosity to a predisposition for vascular disease. A meta-analysis from the several studies realized until 1998, have concluded that TT genotype is not a determinant factor in a well nourish population, a conclusion supported by our results.

Key Words: Hypertension, genetics, polymorphism

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ALDOSTERONE SYNTHASE (CYP11B2)-344CT POLYMORPHISM IS ASSOCIATED WITH SHORT TELOMERES AND CAROTID ARTERY PLAQUES

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The aim of this study was to examine the influence of the aldosterone synthase gene (CYP11B2) on two indices of biological aging, namely telomere length in white blood cells and the presence of carotid artery plaques, in men. The study was conducted in a French cohort of 349 males. We studied associations between the –344 CT polymorphism of the aldosterone synthase gene (CYP11B2) and telomere length assessed in white blood cells, by measuring the length of terminal restriction fragments and detecting the presence of carotid artery plaques.

The presence of the C allele of the –344 CT polymorphism was significantly associated with shortened telomere length: 8.53 ± 0.12kb in TT, 8.26 ± 0.10kb in TC and 8.17 ± 0.09kb in CC subjects (ANOVA p<0.03). The presence of the C allele was also associated with an increased prevalence of carotid artery plaques: 23% in TT subjects, vs 41% in CT and 38% in CC patients (ANOVA p<0.02). This association was observed only in men with high blood pressure. Among hypertensives, the C-allele carriers had a high prevalence of atherosclerotic plaques, whereas the TT patients did not develop such lesions more frequently than normotensive subjects.Carriers of the –344 TT aldosterone synthase genotype, with high blood pressure, do not develop more carotid artery atherosclerotic plaques than normotensive subjects. They also exhibit longer telomere length than subjects in the other hypertensive groups, suggesting a less advanced biological age and a possible protection against hypertensive vascular alterations.

Key Words: Atherosclerosis, aldosterone synthase, telomeres

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ACE GENE POLYMORPHISM IS ASSOCIATED WITH EXERCISE-TRAINING-INDUCED CHANGES IN NA+ EXCRETION IN AFRICAN AMERICAN HYPERTENSIVES

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We previously showed that short-term aerobic exercise training (AEX) increased 24-hr Na+ excretion in hypertensive African Americans. We sought to determine whether changes in urinary Na+ excretion in response to short-term AEX were associated with the angiotensin converting enzyme (ACE) Insertion/Deletion (I/D) gene polymorphism in 26 (age 55 ± 1 yrs) sedentary and mildly hypertensive (BP 146± 2/88± 2 mmHg) African Americans. Subjects were. Subjects underwent a 24-hr period of ambulatory BP monitoring and urine collection at baseline and 14-18 hrs after the last exercise session. AEX consisted of 7 or 8 consecutive days, 50 min/d at 65% of heart rate reserve. Dietary intake was similar during the testing periods before and after AEX as determined by food records. The I/D polymorphism in intron 16 at the ACE gene locus was genotyped using standard PCR techniques and resulted in