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Associations between B vitamin and amino acid intake, *MTHFR* genotype, atherogenic indices, and homocysteine levels in postmenopausal women

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Abstract

It has been hypothesized that insufficiency of one-carbon metabolism may aggravate lipid metabolism disturbances. Lipid metabolism abnormalities and metabolic syndrome (MetS)—which is associated with abnormally high levels of triglycerides (TG) and low levels of high-density lipoproteins (HDL)—often occur in postmenopausal women. The purpose of this study was thus to determine the relationships between amino acid and B vitamin intake, *MTHFR* genotype, lipid profile, and atherogenic indices in postmenopausal women.

131 postmenopausal women were enrolled for the study. The mean macronutrient, amino acid, and B vitamin intake was evaluated using dietary records. Lipid profile and concentrations of apolipoprotein A1 (ApoA1) and B (ApoB) in serum were measured using the colorimetric method. The total homocysteine (tHcy) and glutathione (GSH) level in plasma were measured using high-performance liquid chromatography. *MTHFR* genotype (rs1801133) was determined using a single tube TaqMan SNP Genotyping Assay. We calculated atherogenic indices, such as Castelli's risk index I and II (CRI-I and CRI-II), the atherogenic coefficient (AC), and the TG/HDL ratio.

No association was found between MetS and tHcy or GSH concentrations. *MTHFR* genotype and folate intake also did not affect tHcy, GSH, lipid profile, or atherogenic indices. Subjects with tHcy levels over the median had lower total protein intake, lower animal protein/plant protein ratio, lower protein/carbohydrates ratio, and higher amino acid intake (methionine, lysine, arginine, glycine, and tryptophan) than did subjects with lower tHcy levels. Women who failed to meet their vitamin B₁₂ intake needs had almost 40% higher levels of tHcy than women who did meet those needs.

MTHFR genotype, folate intake, and tHcy levels in plasma are not associated with lipid metabolism in postmenopausal women. tHcy levels may depend on the intake of vitamin B₁₂, and of protein or particular amino acids.

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Conflict of Interest

There is no conflict of interest