

Abstract

Diabetes Metab Res Rev. 2009 Jan;25(1):70-5.

Serum homocysteine, folate, vitamin B12 levels and arterial stiffness in diabetic patients: which of them is really important in atherogenesis?

Shargorodsky M, Boaz M, Pasternak S, Hanah R, Matas Z, Fux A, Beigel Y, Mashavi M.

Department of Endocrinology, Wolfson Medical Center, Tel Aviv, Israel.

AIM: Hyperhomocystinaemia is associated with macro- and microangiopathic diabetic complications. However, the role of homocysteine (Hcy), serum folate, and vitamin B12 level in the development of premature vascular damage in type 2 diabetic patients is not clear. The present study was designed to assess the relationship between total Hcy, folate, and vitamin B12 levels and arterial stiffness, an early marker of generalized atherosclerosis.

METHODS: As many as 86 subjects with type 2 diabetes mellitus were studied. All participants were evaluated for glucose, HbA(1C), lipid profile, hs-CRP, endothelin, Hcy, vitamin B12, and folate. Pulse wave velocity (PWV) and augmentation index (AI) were performed as a non-invasive recording and computer analysis of the two artery sites pressure waveform using SphygmoCor (version 7.1, AtCor Medical, Sydney, Australia).

RESULTS: Hcy was significantly positively associated with age, serum creatinine, and vitamin B12 levels. No association between Hcy and folate was observed. The Hcy concentration was significantly positively associated with PWV ($r = 0.540$, $p < 0.0001$) and AI ($r = 0.390$, $p < 0.0001$). In a general linear model of PWV, Hcy emerged as an independent predictor of PWV even after controlling for age, creatinine, vitamin B12, and folate levels. In a multiple linear regression analysis, the association between Hcy and arterial stiffness was independent of traditional cardiovascular risk factors. Vitamin B12 levels were significantly inversely associated with tHcy ($r = -0.263$, $p = 0.015$) and marginally associated with PWV ($r = -0.212$, $p = 0.052$). Significant associations between folate levels and PWV were not detected.

CONCLUSIONS: The results lend support to the hypothesis that elevated Hcy may have a key role in the development of atherogenesis in diabetic patients. Additionally, vitamin B12 is significantly associated with tHcy concentrations and is identified as a marginally independent correlate of PWV in diabetic patients in the absence of folate deficiency.

PMID: 19065546