

## **The High Atherosclerotic Risk Among Epileptics: the Atheroprotective Role of Multivitamins.**

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Neurologists have little concern about the high atherosclerotic risk among epileptics. Recent evidences mount that chronic epilepsy and prolonged use of antiepileptic drugs (AEDs) are associated with multiple risk factors that are critically implicated in pathobiology and dysfunction of the vessel wall through complex molecular mechanisms that promote atherogenesis. This review is concerned with three metabolic alterations, which are attributed as major risk factors for atherosclerosis among epileptics: altered metabolism of a) homocysteine (Hcy), b) lipids and lipoproteins, and c) uric acid. Most conventional AEDs reduce folic acid levels, thereby raising Hcy levels.

Hyperhomocysteinemia is recently believed to induce endothelial dysfunction and promote atherosclerosis through complex oxidative and excitatory neurotoxic molecular mechanisms. However, Hcy itself is a convulsing substance with increased seizure recurrence and intractability to antiepileptic medications. AEDs can disturb lipid metabolism with resultant hypercholesterolemia and dyslipidemia, common recognized risks for atherosclerosis. Altered uric acid metabolism is common among epileptics. Uric acid has been implicated in endothelial cell damage and decreased endothelial nitric oxide bioavailability. In the presence of atherosclerotic milieu, uric acid interacts with other substrate toxicities and increased reactive oxygen species, accelerating atherosclerosis.

The above information forms the rationale for future routine screening and correction of such metabolic alterations in epileptics. A convincing argument now develops that routine polyvitamin supplementation (folic acid, vitamin B12, vitamin B6, vitamin C, vitamin E, and beta-carotene) becomes increasingly important for women and men receiving AEDs at all ages. The atheroprotective effect of multivitamins is through their antioxidant and anti-inflammatory effects together with their lipid and Hcy lowering effects.

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