

Conclusion: Pre-eclampsia but not (transient) hyperhomocysteinemia leads to activation of the vascular endothelium.

Effect of 3-year folic acid supplementation on hearing thresholds in men and women with age-related hearing loss

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Age-related hearing loss is one of the most prevalent chronic conditions affecting the elderly. Age accounts for 10% of the variation in age-related hearing loss, thus factors that vary with age may play an etiological role in age-related hearing loss. Low levels of B vitamins have been associated with poor hearing and animal studies have shown that B vitamin deficiency leads to cochlear malformations. In this study we examine the effect of 3-year oral folic acid supplementation (0.8 mg/d) v placebo in a double blind randomized controlled trial. Pure-tone air conduction thresholds in 729 middle-aged and elderly men and postmenopausal women with bilateral sensorineural hearing loss were measured at baseline and after 3 years. At baseline, homocysteine, erythrocyte folate and vitamin B6 were not associated with hearing thresholds, whereas, low concentrations of serum folate and vitamin B12 were associated with better hearing. The effect of folic acid supplementation has not yet been analyzed, but will be completed by the end of February 2005.

Effect of valproate on homocysteine and vitamin status

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Treatment with some antiepileptic drugs (cytochrome 450 inductors) is associated with a risk of increased homocysteine and interactions with the vitamins involved in its metabolism. Data on valproate (cytochrome 450 inhibitor) are conflicting. Our study consisted of patients on long-term monotherapy with valproate (n=38), phenytoin (n=28) or carbamazepine (n=40) and control group (n=36). The participants did not use any vitamin supplements. Plasma total homocysteine, serum and erythrocyte folate, vitamins B12, B6, MTHFR C677T and A1298C mutation were determined. Homocysteine >12 µmol/L was detected in 33% of patients. No one taking valproate had homocysteine >15 µmol/L. Patients on valproate treatment and the controls had significantly lower homocysteine in comparison with the other groups (p<0.001). Mean homocysteine in valproate group was significantly lower than in the controls (p<0.001). Mean folate levels were found to be reduced in phenytoin (p<0.001) and carbamazepine (p<0.005) group in comparison with the other groups. There were no significant differences in vitamin B12 and B6 concentrations between the four groups. Vitamin B12 was slightly higher in valproate group (no significantly). Homozygosity for the C677T and A1298C polymorphisms were observed in 11% resp. 9%, combined heterozygosity in 21%. Our results may be explainable by the different biotransformation pathway of anticonvulsants.

Nigella Sativa (Black Seed) protection against hyperhomocysteinemia induced by methionine rich-low folate-low B vitamins diet in rats

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Elevated levels of plasma homocysteine appear to be associated with higher risks of occlusive vascular disease as well as in a number of other clinical conditions. The exact mechanism for homocysteine influence is not fully understood. Recently we have shown that Thymoquinone, the most active component in Nigella Sativa seeds, as well as the seed's oil, caused almost complete protection against methionine-induced Hyperhomocysteinemia in blood plasma of rats as well as the oxidative stress associated with this state. Here we show that homocysteine levels in blood serum of rats fed a methionine-enriched diet (with low levels of folate, vitamins B6 and B12) for 7 weeks together with Nigella seeds (at 250 mg/kg/day; oral suspension) led to 72.1±3.35% protection against Hyperhomocysteinemia induced by the same diet without the seeds. There was no significant change in homocysteine levels in control groups fed a standard diet with or without the seeds. Similar measurements made on liver tissue homogenates from treated and control rats showed no significant effects on homocysteine levels in any of their respective liver homogenates. The effect of the seeds on heart and brain tissues is under investigation.

Cognitive performance in elderly people with and without vitamin B12 deficiency

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Vitamin B12 deficiency is associated with cognitive impairment in both healthy and cognitively impaired elderly people. Baseline results on cognitive performance of 195 elderly participants of an intervention trial are compared with a subsample of 40 elderly people with a normal vitamin B12 status. The neuropsychological test battery comprised sensitive tests that measure attention (Digit Span), speed (Finger Tapping, Trail Making), memory (15 Word Test, Figure of Rey), executive function (Trail Making, Stroop), and fluid intelligence (WAIS, Raven, Word Fluency). The Clinical Dementia Rating (CDR) scale classifies the proportion of elderly with normal cognitive performance, mild (MCI), and severe cognitive impairment. Elderly with vitamin B12 deficiency (vitamin B12 and MMA concentrations were 186 pM and 0.37 µM, respectively) were slightly older (82±5 year) than elderly with a normal B12 status (78±5 year; vitamin B12 and MMA concentrations were 306 pM and 0.32 µM, respectively). Preliminary results of the 195 elderly with vitamin B12 deficiency on cognitive performance indicate that MCI was present in 27%, and severe cognitive impairment in 12%. Especially the domains memory and executive function appeared to be impaired. Cross sectional analysis are currently being conducted and results will be presented during the conference.

Plasma homocysteine levels do not independently correlate with carotid intima media thickness

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