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Folic acid and L-5-methyltetrahydrofolate: comparison of clinical pharmacokinetics and pharmacodynamics.

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Abstract

There is a large body of evidence to suggest that improving periconceptional folate status reduces the risk of neonatal neural tube defects. Thus increased folate intake is now recommended before and during the early stages of pregnancy, through folic acid supplements or fortified foods. Furthermore, there is growing evidence that folic acid may have a role in the prevention of other diseases, including dementia and certain types of cancer. Folic acid is a synthetic form of the vitamin, which is only foundin fortified foods, supplements and pharmaceuticals. It lacks coenzyme activity and must be reduced to the metabolically active tetrahydrofolate form within the cell. L-5-methyl-tetrahydrofolate (L-5-methyl-THF) is the predominant form of dietaryfolate and the only species normally found in the circulation, and hence it is the folate that is normally transported into peripheral tissues to be used for cellular metabolism. L-5-methyl-THF is also available commercially as a crystalline form of the calcium salt (Metafolin(R)), which has the stability required for use as a supplement. Studies comparing L-5-methyl-THF andfolic acid have found that the two compounds have comparable physiological activity, bioavailability and absorption at equimolar doses. Bioavailability studies have provided strong evidence that L-5-methyl-THF is at least as effective as folic acid inimproving folate status, as measured by blood concentrations of folate and by functional indicators of folate status, such as plasma homocysteine. Intake of L-5-methyl-THF may have advantages over intake of folic acid. First, the potential for masking the haematological symptoms of vitamin B(12) deficiency may be reduced with L-5-methyl-THF. Second, L-5-methyl-THF may be associated with a reduced interaction with drugs that inhibit dihydrofolate reductase.

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