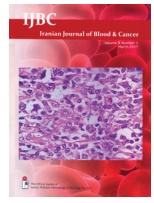
IJBC 2017; 9(1): 27-28

Iranian Journal of Blood & Cancer

Journal Home Page: www.ijbc.ir



Letter to Editor

Folic Acid Supplementation: to Advise or not to Advise?

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ARTICLE INFO

Article History:
Received: 27.12.2016
Accepted: 02.02.2017

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Please cite this article as: Shahriari M. Folic Acid Supplementation: to Advise or not to Advise?. IJBC 2017; 9(1): 27-28.

Dear Editor

It has been well known that Folic Acid (Folicin, Folate, Vitamin B9) is from the vitamin B family and these vitamins are water soluble and do not accumulate in tissues because they can be secreted in the urine. Folate is synthesized de novo by bacteria, plants, fungi, and certain protists. Animals and human are dependent on their diets for adequate supplies of this vitamin. Food with very high folate content include dark green vegetables, orange juice, nuts, legumes, and liver. However, the reduced folates present in food are labile to light and oxidation and are partly destroyed during processing and cooking.[1] The recommended daily allowance for folate is expressed in dietary folate equivalents to take into account the greater bioavailability of folic acid form than the reduced polyglutamylated forms present naturally in foods and fruits.

The average content of body stores in adults has been estimated to be 12-28 mg folate, half of which is stored in the liver.[2] It is relevant to note that the ratio of body folate stores to recommended daily intakes is less than 100:1, whereas the ratio for cobalamin approximates 1000:1. As a result, the folate depletion necessary to produce megaloblastic anemia is achieved much more rapidly than depletion of cobalamin. Storage data are sparse in children, but infants of normal birth weight who died in the perinatal period had hepatic folate contents of 0.76 mg; low-birth-weight infants' hepatic content averaged only 0.13 mg.[3] These data, although not fully representative, suggest much lower stores to recommended intake ratios in newborns and infants than in adults.

Recognition that supplementation in the periconceptional period with folic acid results in decreased occurrence and recurrence of neural tube defects (NTDs) in children of women with no clinical evidence of folate deficiency,[3,4] led to recommendations that all women of childbearing years should take folate supplements (200 to 400 µg daily), because the critical period for prevention of NTDs is early in pregnancy before most women are aware that they are pregnant. Since January 1998, folic acid fortification of all enriched cereal-grain products has been mandated in the United States, Canada, and parts of South America.[3] As a result, serum and red blood cell (RBC) folate concentrations have increased in these populations and the incidence of NTD-affected pregnancies has decreased by 26% in the United States and by 48% in Canada.[4,5] On the other hand, concerns about folate fortification delaying the diagnosis of cobalamin deficiency, promotion of cancer growth, and issues of free choice have delayed mandating folate addition to the diet in Europe and elsewhere.[6] Although the defense against infections relies on the ability of the immune cells to proliferate and differentiate and on the effective renewal of the epithelial linings. Folates and vitamin B-12 play a crucial role in DNA and protein synthesis, which suggest that processes in which cell proliferation is essential may be impaired by poor status. Macroscopic disruption of the epithelial linings occurs with antifolate treatment, and the immune system is affected by folate and vitamin B-12 deficiency. The phagocytic and bactericidal activity

of polymorphonuclear leukocytes is poor in individuals with severe folate deficiency and improves with folate replenishment. In one clinical trial investigating the impact of folic acid and/ or vitamin B_{12} supplementation on the prevention of diarrhea and risk of infections; neither folic acid nor vitamin B-12 administration reduced the incidence of diarrhea or lower respiratory infections. In comparison with placebo, children treated with folic acid alone or in combination with vitamin B-12 had a significantly higher risk of persistent diarrhea.[7]

Although many reports of folic acid toxicity or increased risk of cancer (especially lung cancer) need confirmation in larger trials, but so do many claims of preventive benefits of folates. Exposing normal individuals especially children to chronically high dose of vitamins needs serious caution, even for folic acid. Meanwhile, the needs of selected patients with chronic hemolysis or pregnant women should not be the reason for fortification of grain for general population; even if there was no economical concern. So still there is not really any consensus regarding administering folates as supplement for general population; or even for specific populations except in peri-conceptional period in women and pregnancy.

Conflict of Interest: None declared.

References

1. Nguyen TH, Indrawati, Hendrickx M. Model studies on the stability of folic acid and methyltetrahydrofolic acid degradation during thermal treatment in combination with high hydrostatic pressure. J Agric Food Chem. 2003; 51 (11): 3352–7. doi: 10.1021/jf026234e. PubMed PMID: 12744666.
2. MacKenzie RE, Baugh CM. Tetrahydropteroylglutamate derivatives as substrates of two multifunctional proteins with folate-dependent enzyme activities. Biochim Biophys Acta1980; 611(1):187-95. doi: 10.1016/0005-2744(80)90054-6.
3. Kawai K, Spiegelman D, Shankar AH, Fawzi WW. Maternal multiple micronutrient supplementation and pregnancy outcomes in developing countries: meta-analysis and meta-regression. Bull World Health Organ. 2011; 89(6):402-411B. doi: 10.2471/BLT.10.083758. PubMed PMID: 21673856.
4. Tabei SM, Mazloom M, Shahriari M, Zareifar S, Azimi A, Hadaegh A, et al. Determining and surveying the role of carnitine and folic acid to decrease fatigue in β-thalassemia minor subjects. Pediatr Hematol Oncol. 2013; 30(8):742-7. doi: 10.3109/08880018.2013.771388. PubMed PMID: 23458634.
5. Shahriari M. Serum folate level in minor thalassemia. IJMS. 2000; 26: 331.
6. Ebbing M, Bønaa KH, Nygård O, Arnesen E, Ueland PM, Nordrehaug JE, et al. Cancer incidence and mortality after treatment with folic acid and vitamin B12 . JAMA. 2009; 302(19):2119-26. doi: 10.1001/jama.2009.1622. PubMed PMID: 19920236.
7. Taneja S, Strand TA, Kumar T, Mahesh M, Mohan S, Manger MS, et al. Folic acid and vitamin B-12 supplementation and common infections in 6–30-mo-old children in India: a randomized placebo-controlled trial. Am J Clin Nutr. 2013; 98(3):731-7.