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Vitamin and Mineral Deficiencies = Radiation Damage?

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The Diet-Induced Pro-Inflammatory State -

I never thought I would write an article with such a title. At first glance, such a relationship seems a little hard to swallow. Nonetheless, such a connection appears to exist and was reviewed in a recent issue of *Mutation Research,*[1] a journal that has been around for a long time, but not one DCs would commonly read. I came across this article during a Medline search for new studies on multivitamins.

I have been amazed at the new work on multivitamins that has been published in recent years. For example, Chandra performed a randomized, double blind, placebo-controlled trial to determine if one year of multivitamin supplementation could help cognitive function in men and women 65 years of age or older.[2] Compared with controls, the supplement group showed a significant improvement in all cognitive tests ($P<0.001$ to 0.05) except long-term memory recall ($P > 0.1$). Consider Chandra's conclusion:

"We recommend that such a supplement be provided to all elderly subjects because it should significantly improve cognition and thus quality of life and the ability to perform activities of daily living. Such a nutritional approach may delay the onset of Alzheimer's disease."[2]

Supplementation with a multivitamin/mineral also proved to lower homocysteine levels in a group of 50-87 year-olds who already consumed a folate-fortified diet.[3] The mean homocysteine concentration decreased 9.6 percent in the supplemented group (P: < 0.001), and was unaffected in the placebo group. No significant changes in dietary intake were noted during the intervention. Based on this work, we can suggest that routine multivitamin supplementation might have a profound impact on preventing heart disease.

We can also protect vision with multivitamins. Compared with nonusers, the five-year risk for any cataract was 60 percent lower among persons who, at follow-up, reported the use of multivitamins, or any supplement containing vitamin C or E, for more than 10 years.[4]

Feeling a little stressed out? Multivitamin supplementation appears to help people better cope with stress. There were no statistically significant differences between the two study groups for demographics and baseline stress scores at a recent study's entry. Both groups (151 supplemented and 149 placebo) improved between baseline and the end of treatment as assessed. The degree of improvement was statistically significant and greatest in the supplemented group for all psychometric instruments, with this beneficial effect increasing over the course of the day. The multivitamin/mineral combination tested is well tolerated and can be used as part of a treatment program for stress-related symptoms at the recommended dose.[5]

Supplementation with multivitamins has even been shown to reduce birth deformities. Research found a 48 percent risk reduction for cleft lip (with or without cleft palate) among infants of mothers who used multivitamins during the periconceptional period, or who started multivitamin use during the first postconceptional month (after controlling for several covariates).[6] With this study in mind, consider the title of this article. Most are well aware that radiation exposure can damage DNA and cause birth defects and cancer in children of exposed parents. However, very few of us would have considered that vitamin deficiencies can mimic radiation exposure. Ames[1] explains:

"A deficiency of any of the micronutrients: folic acid, vitamin B_{12}, vitamin B_6, niacin, vitamin C, vitamin E, iron, or zinc mimics radiation in damaging DNA by causing single and double-strand breaks, oxidative lesions, or both. Common micronutrient deficiencies are likely to damage DNA by the same mechanism as radiation and many chemicals, appear to be orders of magnitude more important, and should be compared for perspective. Remedying micronutrient deficiencies should lead to a major improvement in health and an increase in longevity at low cost."[1]

According to Ames,[1] the RDA is mainly based on information on acute effects, and the optimum amount for long-term health is generally not known. Optimum intake of a micronutrient can vary with age and genetic constitution, state of well-being, and is also influenced by other aspects of diet. The optimum amount to protect against genomic damage is generally thought to be higher than the current recommended daily allowance, and a sizeable percentage of the population is deficient relative to the RDAs.

In the recent past, many in mainstream medicine belittled multivitamin supplementation. However, recent research should dramatically change this view. Indeed, the June 19 issue of the *Journal of the American Medical Association* contained two articles devoted to the importance of multivitamin supplementation.[7,8] In no uncertain terms, Fletcher and Fairfield state:

"In the absence of specific predisposing conditions, a usual North American diet is sufficient to prevent overt vitamin deficiency diseases. ... However, insufficient vitamin intake is apparently a cause of chronic diseases. ... A large proportion of the general population is apparently at increased risk for this reason. ... We recommend that all adults take a multivitamin daily."[8]

Despite your background and approach to patient care, it is certainly reasonable to recommend supplementing with at least a multivitamin. As chiropractors, our philosophical orientation is to prevent the development of disease. Accordingly, the utilization of multivitamins in practice should be an easy addition if you are not already doing so. Multivitamin supplementation is a simple intervention that all patients need, and compliance is high if the importance of such supplementation is properly described.

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