Vitamins have long been recognized for their unique role in human nutrition. Most of these low-molecular weight, organic substances are precursors of coenzymes, and adequate amounts to meet the known nutritional needs of healthy persons of all ages have been defined by the Food and Nutrition Board of the National Academy of Sciences as the “Recommended Dietary Allowances” (RDA). The consistent opinion of the Committee on Nutrition of the American Academy of Pediatrics has been that normal children receiving a normal diet do not need vitamin supplementation over and above RDA levels.

However, there are a variety of clinical entities in which the daily intake of vitamins needs to be significantly increased. This is true, for example, with the fat-soluble vitamins A, D, E, and K in the steatorrhoeas and in the autosomal recessive selective malabsorption of vitamin B₁₂. Rarely, children treated with isoniazid require increased pyridoxine; and, when treated with diphenylhydantoin sodium (Dilantin), they need increased folic acid and vitamin D. Finally, there are a number of rare inborn errors of metabolism affecting the apoenzyme at the cofactor binding site or involving the metabolism of the vitamin itself to its biologically active derivative. In these so-called dependency syndromes, the metabolic defect may completely or partially be overcome by greatly increasing vitamin or cofactor availability.

Set against a background of wide public belief in the benefits of vitamins, the accounts of dramatic amelioration of deficiency states, the easy and relatively inexpensive availability of these substances, and the occasional, remarkable benefit of large doses (both in the dependency syndromes and in certain other clinical situations), it is not surprising that a cult developed in the use of large doses of water-soluble vitamins to treat a wide spectrum of disease states. In particular, “megavitamin” therapy came to be applied to...
the use of large amounts of nicotinic acid or nicotinamide in the treatment of schizophrenia. Pauling, in 1968, coined the term "orthomolecular medicine," meaning the treatment or prevention of diseases by altering body concentrations of certain normally occurring substances. Pauling's term now encompasses the additional use of nicotinamide adenine dinucleotide (NAD), riboflavin, ascorbic acid, pyridoxine, calcium pantothenate, vitamin B₁₂, folic acid, and trace minerals in doses considerably in excess of the RDA for a wide range of problems including arthritis, neuroses, geriatric problems, hyperlipidemia, and depression.

This "orthomolecular" approach has been used in children primarily in the treatment of nonspecific mental retardation, psychoses, autism, hyperactivity, dyslexia, and other learning disorders reminiscent of an earlier advocacy of large doses of glutamic acid for Down's syndrome.²⁻¹⁰ The substantially anecdotal evidence of therapeutic benefit in these and other conditions should be viewed with skepticism until vigorous evidence of benefit has been obtained and published in peer reviewed journals.

As an example of this approach, Cott¹¹ reports giving niacin (1 to 2 gm/24 hr), ascorbic acid (1 to 2 gm/24 hr), pyridoxine (200 to 400 mg/24 hr), and calcium pantothenate (400 to 600 mg/24 hr) to more than 500 children with psychoses and learning disabilities. The author claims that the treatment shows promise and is sometimes dramatic; however, no precise data are given on which any objective assessment of results can be made.

Although no comparable evaluation has been carried out on children for autism and learning disabilities, the claims of orthomolecular psychiatrists in the treatment of adult schizophrenia have recently been carefully examined in a report to the American Psychiatric Association by a Task Force on Vitamin Therapy in Psychiatry.¹²⁻¹⁴ Their conclusions were emphatic that orthodox, properly controlled, and well-standardized trials found nicotinic acid therapy to be without value. Moreover, there is some evidence that long-term administration of high doses of nicotinic acid in man may lead to persistent skin erythema, pruritus, tachycardia, liver damage, hyperglycemia, and hyperuricemia.¹¹

There are a number of situations in pediatric practice where a specific vitamin deficiency can be demonstrated by biochemical tests and increased amounts of vitamins can be shown to resolve these conditions. Vitamin therapy under these conditions is justified, and it is reasonable to expect that other conditions of this type will be identified. In contrast, megavitamin therapy as a treatment for learning disabilities and psychoses in children, including autism, is not justified on the basis of documented clinical results.

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