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Orthomolecular Therapy

Stephen Barrett, M.D.

"Orthomolecular therapy" is defined by its proponents as "the treatment of disease by varying the concentrations of substances normally present in the human body." Its proponents claim that many diseases are caused by molecular imbalances that are correctable by administration of the "right" nutrient molecules at the right time. (*Ortho* is Greek for "right.")

Orthomolecular therapy dates back to the early 1950s when a few psychiatrists began adding massive doses of nutrients to their treatment of severe mental problems. The original substance was vitamin B3 (nicotinic acid or nicotinamide), and the therapy was termed "megavitamin therapy." Later the treatment regimen was expanded to include other vitamins, minerals, hormones, and diets, any of which may be combined with conventional drug therapy and electroshock treatments. A few hundred physicians now use this approach to treat a variety of conditions, both mental and physical.

During the 1980s, for example, the Princeton Brain Bio Center (not affiliated with Princeton University), in Skillman, New Jersey, touted its "nutritional" treatment for alcoholism, allergies, arthritis, autism, epilepsy, hypertension, hypoglycemia, migraine headaches, depression, learning disabilities, retardation, mental and metabolic disorders, skin problems, and hyperactivity [1]. Its services included laboratory tests that most physicians would not consider necessary or useful for diagnosing these disorders.

Critical Analyses

Several expert teams have examined the claims of "orthomolecular" proponents and concluded that they are unsubstantiated.

In the early 1970s, a special American Psychiatric Association task force investigated the claims of psychiatrists who espoused the orthomolecular approach. The task force noted that these practitioners used unconventional methods not only in treatment but also for diagnosis. Its conclusion was probably the most strongly worded statement ever published by a scientific review body:

> This review and critique has carefully examined the literature produced by megavitamin proponents and by those who have attempted to replicate their basic and clinical work. It concludes in this regard that the credibility of the megavitamin proponents is low. Their credibility is further diminished by a consistent refusal over the past decade to perform controlled experiments and to report their new results in a scientifically acceptable fashion.
> Under these circumstances this Task Force considers the massive publicity which they promulgate via radio, the lay press and popular books, using catch phrases which are really misnomers like "megavitamin therapy" and "orthomolecular treatment," to be deplorable [2].

The Research Advisory Committee of the National Institute of Mental Health reviewed pertinent scientific data through 1979 and agreed that megavitamin therapy was ineffective and could be harmful. After the U.S. Defense Subcommittee looked into this therapy, it was removed as a treatment covered by CHAMPUS, the insurance program for military dependents.

Various claims that megavitamins and megaminerals are effective against psychosis, learning disorders, and mental retardation in children were debunked in reports by the nutrition committees of the American

Academy of Pediatrics (AAP) in 1976 and 1981 and by the Canadian Academy of Pediatrics in 1990 and 2000 [3]. Both groups warned that there was no proven benefit in any of these conditions and that megadoses can have serious toxic effects. The 1976 AAP report concluded that a "cult" had developed among followers of megavitamin therapy [4]

In 1991, Dutch researchers reported their evaluation of 53 controlled trials of the effects of niacin, vitamin B6, and multivitamins on mental functions. They concluded:

> Virtually all trials show serious shortcomings: in the number of participants, the presentation of baseline characteristics and outcomes, and the description of changes in concomitant treatments. Only in autistic children are some positive results are found with very high dosages of vitamin B6 combined with magnesium, but further evidence is needed before more definitive conclusions can be drawn. For many other indications (hyperactive children, children with Down's syndrome, IQ changes in healthy schoolchildren, schizophrenia, psychological functions in healthy adults and geriatric patients) there is no adequate support from controlled trials in favor of vitamin supplementation [5].

Subsequently, an American team using an extensive computer search was able to locate 12 studies on B6 and magnesium for autism. Their analysis, published in 1995, concluded:

> The majority of studies report a favorable response to vitamin treatment. However, interpretation of these positive findings needs to be tempered because of methodological shortcomings inherent in many of the studies. For example, a number of studies employed imprecise outcome measures, were based on small samples and possible repeat use of the same subjects in more than one study, did not adjust for regression effects in measuring improvement, and omitted collecting long-term follow-up data [6].

All 12 of these studies appear to have been written by researchers who are close associates. (One person, for example, coauthored eleven of the reports.) Each of the studies used at least 600 mg per day of vitamin B6, which is well above the minimum amount reported to cause nerve damage. So even if such doses of B6 are effective, they are probably not safe to use.

A recent randomized double-blind study found no evidence that regulating the vitamin levels of adult schizophrenics influenced the clinical status of 19 adult schizophrenic patients. The experimental group received amounts of megavitamins based on their individual serum vitamin levels plus dietary restriction based on Radioallergosorbent (RAST) tests. The control group received 25 mg vitamin C and were prescribed substances considered allergenic from the RAST test. After five months, there were marked differences in serum levels of vitamins but no consistent symptomatic or behavioral differences between the groups [7].

The Bottom Line

The human body has limited capacity to use vitamins in its metabolic activities. When vitamins are consumed in excess of the body's physiological needs, they function as drugs rather than vitamins. A few situations exist in which high doses of vitamins are known to be beneficial, but they must still be used with caution because of potential toxicity. For example, large doses of niacin can be very useful as part of a comprehensive, medically supervised program for controlling abnormal blood cholesterol levels. "Orthomolecular" practitioners go far beyond this, however, by prescribing large amounts of supplements to all or most of the patients who consult them. This approach can result in great harm to psychiatric patients when used instead of effective medications.

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