Ann Natl Acad Med Sci (India), **34(3)**: 203-205, 1998

BOOK REVIEW

Role of Micronutrients in AIDS: New Concepts

Varuna Kochar

This book on AIDS does not create a very good impression at first sight. Written by a biochemist with an award to her credit from the Indian Board of Alternative Medicine, it looks like an over-blown version of an intuitive flash which the author is very keen to share lest the benefits of her revelation are lost to mankind. But a perusal of the preface dispels any such notions. It is neither a revelation nor a revolution but a sensible deduction based on the well-established interaction of nutrition and infections with special reference to AIDS. The credibility of the contents is further enhanced by knowing that the manuscript was reviewed by three eminent medical scientists: Dr. C. Gopalan, Dr. S.P. Tripathy and Dr. S. Sriramachari.

The work is a remarkably lucid synthesis of knowledge culled from more than 300 references, which occupy 40 pages of the 94-page booklet. The fact that the entry of the causative virus into the body is an essential factor in the aetiology of AIDS has been duly acknowledged by the author. But what has been emphasized is the fact that the further course of the disease is profoundly influenced by the nutritional status of the host. A poorly nourished host, because of already weakened immune mechanisms, gets full-blown AIDS soon after the entry of the virus. But in a well-nourished host the gap between turning HIV-positive and getting full-blown AIDS can be several years. By the same token, the author has emphasized, a patient having clinical manifestations of AIDS may be helped by due attention to his nutritional status. The relationship between nutrition and infections has been known for very long. The vicious cycle of malnutrition predisposing to infections, and infections worsening the malnutrition was formally proposed more than 30 years ago by Nevin Scrimshaw, Carl Taylor and John Gordon on the basis of their observations in Latin American countries. Subsequent advances in immunology have only provided a firm basis for the initial epidemiological observations. Extrapolating the relationship between nutrition and infection to AIDS is also not original as acknowledged by the author through several references cited in the book. But the book does emphasize an important but frequently overlooked factor in the pathogenesis and treatment of AIDS.

Published by Prerna Publishing House, PO Box 149, Noida Complex Post Office, Sector 19, Noida 201 301 (UP), India, 1996. Price: Rs. 95.00 (US$ 5.00).

The body of the book consists of three chapters followed by an appendix and an alphabetically arranged list of all the references cited. The first chapter establishes the background for the subject of the book. The second chapter provides a well organized account of the subject in five parts. The first part emphasizes the commonality of circumstances which might predispose to malnutrition as well as AIDS. The circumstances comprise frequent ejaculation in men, frequent blood transfusions (as in haemophilia), homosexuality, alchohol and drug addiction, use of oral contraceptives, and pregnancy. Part II lists the various abnormalities of immune mechanisms resulting from micronutrient deficiency. The impairment of complement system may particularly explain why in malnourished HIV -positive patients the neutralization of the virus by HIV antibodies is poor, thereby shortening the gap between seropositivity and clinical manifestations. Part III discusses the higher prevalence of infections such as tuberculosis and candidiasis among HIV-positive patients due to their immunocompromised status. The opportunistic infections, in turn, accelerate the development of AIDS in these patients. Part IV discusses the higher susceptibility of males having AIDS to Kaposi's sarcoma and brings out the relationship of this malignancy to selenium deficiency on one hand, and the great likelihood of this deficiency in male patients due to the role of selenium in spermatogenesis. Finally, Part V builds up a good case for studies on the efficacy of flavonoids in the treatment of AIDS. The third and last chapter discusses the nutritional aspects of treatment of AIDS and gives elaborate Tables listing the dietary sources of micronutrients and flavonoids. The appendix, 14-page long, describes the role of zinc, selenium, iron, vitamin B12 and folic acid in metabolism, cell division and reproduction. This is very relevant to the theme of the book because immune mechanisms as well as reproduction require a high level of cell proliferation. When the nutritional status with respect to micronutrients required for cell division is marginal, it is quite likely that use of these nutrients for one function may be at the expense of another. In promiscuous males, excessive use of nutrients for spermatogenesis and seminal secretion may be at the expense of immunocompetence. If such a person contracts HIV, the possibility of the clinical manifestations of AIDS multiplies due to his immunocompromised status.

The writer has worked hard to provide a complete book on the subject. Although the theme is restricted, no aspect of the theme - physiological, biochemical or clinical, has been left out. However, if the reader still wants more details on any aspect, an exhaustive list of references is also available within the book. The book has a stamp of authority because several eminent experts have been consulted while preparing it. Mr. S.B. Ghosh, an expert in editing, has ensured that the language is also precise and readable. Printing errors have also been limited to the bare minimum. In short, the book is a labour of love in which no effort has been spared to make the undertaking worth-while.

No human creation is perfect, however, and I have been able to spot a few points which merit criticism. The role of nutrient losses in semen seems to have been exaggerated, keeping in view the extremely minute quantities lost in each ejaculate (page 11). In most cases, the quantity lost is

not even 10% of the daily metabolic requirement, and not even 1% of the recommended dietary allowance (RDA). It might be argued that promiscuity may lead to several ejaculations per day. But it is known that if the frequency of ejaculation increases the quantity of semen per ejaculate is reduced markedly. This criticism is by no means meant to condone promiscuity, which has undesirable implications going far beyond nutrient losses, but merely to put a scientific point in its proper perspective. Then, on page 14 drugs such as morphine and cocaine have been grouped under 'recreational drugs'. Although technically correct, the adjective `recreational' is misleading. The expression `drugs of addiction' might have been a better choice. Finally, the book gives an impression of elaborating excessively and needlessly on every single point of the central theme. For example, the seven `hypotheses' (pages 3-4) linking malnutrition, immunodeficiency and AIDS are essentially an elaboration of the well established relationship between malnutrition and impaired immunity. The seven `hypotheses' are merely seven groups of studies by different authors pointing to this single fact. In took William Harvey 60 pages of *De Motu Cordis* to describe his discovery of circulation, which may today be stated in less than a page. He had to do it because he anticipated scepticism, criticism, and even ostracism. Probably Varuna Kochar expected a similar reaction to her thesis. But today the environment is more open to new ideas, and secondly, her thesis does not have the novelty of Harvey's discovery. In fact, while her extensive bibliography is impressive, it is also a confession of lack of novelty. I claim no originality in admitting, however, that originality is nothing but judicious imitation, and would hasten to add that Kochar's book has the merit of attracting attention to a rather neglected aspect of AIDS.

The author deserves compliments for acquiring mastery over a subject which goes beyond her qualifactions as a biochemist. Her book also points out possibly fruitful lines for future research on the subject. The book would be useful for medical libraries as well as all those interested in AIDS as clinicians or for research.

R.L. Bijlani
Department of Physiology,
All India Institute of Medical Sciences,
New Delhi - 110 029, India