
Conference Summaries

2nd International Conference on AIDS in India, December 1999

The 2nd International Conference on AIDS in India, which was organized by the Department of Experimental Medicine, Tamil Nadu Dr. M.G.R. Medical University, was held in Chennai, India, on December 5-8, 1999. In addition to the national delegates, the conference was attended by 652 national and international experts.

On December 6, the first AIDS Society of India was formed and inaugurated by Mark Wainberg, president of the International AIDS Society.

HIV/AIDS prevalence is increasing in India, where as many as 8 million people may be infected. Available interventions are not adequate. The conference participants recommended the following prevention measures:

The Chennai Statement

1. Simplified, low-cost medical interventions (including antiviral drugs, which can substantially reduce mother-to-infant HIV transmission, should be implemented.
2. Medicines against HIV and opportunistic infections should be made affordable and accessible, and discrimination against HIV-infected persons in the workplace, health-care industry, and other social contexts should be addressed.
3. Medical professionals should receive special training in the treatment of HIV infection and disease. Formal training leading to postgraduate qualification in HIV medicine will improve the quality and equity of health care for infected persons in various clinical settings. Similarly, formal training toward postgraduate qualification in transfusion medicine will improve blood safety and the use of blood components, and thus the use of donated blood. The Medical Council of India and medical universities around the country should develop such postgraduate training.
4. Folklore, traditions, and other elements of Indian culture should be systematically reviewed and adapted to teaching children and youth about responsible, safe behavior to

prepare them for their roles as future parents. Medical systems in India should be rigorously and scientifically evaluated by multicenter studies, and improvements in treating HIV disease should be introduced.

5. India must invest in research to develop vaccines and antiviral and antimicrobial drugs for the prevention and treatment of HIV disease and opportunistic infections.
6. Cooperative efforts should be made within India to collaborate with international coalitions for the prevention, control, and treatment of HIV/AIDS.
7. In all strategic planning, the voice of the people, particularly the voice of infected people, must be taken into account.

We believe that the above recommendations will help control the AIDS epidemic, with all its socioeconomic implications, in India.

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Workshop on Micronutrients and Infectious Diseases: Cellular and Molecular Immunomodulatory Mechanisms

Epidemiologic and clinical data, as well as experimental studies, suggest a bidirectional interaction between micronutrients and infectious pathogens. While nutritional deficiencies can alter several aspects of the innate and acquired immune responses to pathogens, some infectious diseases alter the nutritional status of the host and the host's ability to absorb micronutrients. Nutritional deficiencies may also influence pathogen mutations directly, affecting virulence and clinical outcome. These interactions depend on a number of other variables, including the severity of micronutrient deficiency, the age and clinical condition of the host, and a variety of environmental factors.

To address issues pertinent to understanding the role(s) of micronutrients in the control of infectious disease, the National Institute of Allergy and Infectious Diseases organized a 2-day meeting, cosponsored by the Office of Dietary Supplements, National Institutes of

Health. Representatives attended from several other NIH institutes and centers, the U.S. Agency for International Development, the U.S. Department of Agriculture, the U.S. Food and Drug Administration, the Council for Responsible Nutrition, and the World Bank. The objectives of this meeting were to provide a forum for the exchange of ideas between basic scientists, nutritionists, infectious disease specialists, and clinical epidemiologists; to examine the mechanisms involved in the pathogenesis and clinical manifestations of infectious diseases, including the immunology, molecular biology, and potential direct interactions between micronutrients and pathogens; evaluate current strategies for intervention; and summarize research needs and new directions.

The workshop provided information on the effects of micronutrients on innate and adaptive immunity, mucosal immunity, cytokine production, gene expression, and intracellular signaling pathways. In addition, a session focused on the implications of basic research findings for the treatment of disease. The workshop opened with an overview on how dietary characteristics modulate immune responses. Although the field is in its infancy, areas in particular need of research include the role of micronutrients in innate and mucosal immunity, as well as the early phases of development of immune cells. Instances of direct interaction between micronutrients and pathogens were also described, for example, how a benign strain of an infectious agent can become virulent when passaged through micronutrient-deficient mice. Examples of host-pathogen interactions, in which nutrition is an important modulator, provide new opportunities for study, especially as the host's genetic background and the role of specific genes are elucidated. One potential mechanism of immune suppression is the alteration of cytokine responses. Molecular studies using gene knock-

out mice also provided new information about nutrient transport proteins and their relationship to normal immunity.

At the conclusion of the workshop, a panel of experts, including basic scientists, infectious disease specialists, and clinical epidemiologists, submitted recommendations for future research: the development of a panel of assays that could be used for general screening of a nutrient's impact on immunocompetence; the need to define reproducible molecular and immunologic biomarkers that can be used in human and animal studies; the need to continue basic mechanistic studies on both the role of micronutrients as antioxidants or as regulatory molecules within the immune system and the effects of micronutrient status on the decline of immune function in the elderly; the need to encourage more efficient use of transgenic knock-outs and other appropriate animal models, as well as the use of microarray technology, by investigators in this area of research; the need for investigators to link basic molecular, mechanistic studies with field work in areas of endemic infectious diseases of greatest public health importance; the need for innovative approaches for combining nutritional supplementation and immunotherapy in new forms of intervention; and the need to recruit young investigators with state-of-the-art immunology skills and promote collaborative research with nutrition or infectious disease professionals.

As a result of this workshop, an open *LISTSERV* has been created for continued interaction among interested parties in the field. The *Journal of Infectious Diseases* plans to publish the proceedings of the workshop in a supplement in early 2000. For additional information, contact Christopher E. Taylor, telephone: 301-496-5305; e-mail: ct18m@nih.gov; or Elizabeth Higgs, telephone: 301-496-2544; e-mail: eh63a@nih.gov.