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Discovery and impact of zinc on health: Bio-markers of zinc deficiency

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In the Middle East, nearly 50 years ago, we established the essentiality of zinc for human and documented for the first time occurrence of zinc deficiency in the villages of Iran and Egypt. During the past five decades we have witnessed tremendous advances in both clinical and basic science areas of zinc metabolism. Currently WHO estimates that nearly 2 billion subjects in the developing countries are zinc deficient and widespread growth retardation, immune dysfunction and cognitive impairment are related to zinc deficiency.Therapeutic use of zinc for treatment of acute diarrhea in infants and children in developing countries has saved millions of lives. Zinc is very effective in reducing the incidences of blindness in patients with age related macular degeneration (AMD). Zinc is an approved therapy for patients with Wilson's disease. Zinc administration is effective in decreasing the incidences of infection in the elderly, patients with sickle cell disease and head and neck cancer patients. Zinc is a molecular signal for immune and neuronal cells. In our experimental model of human zinc deficiency we reported that measurement of zinc and ecto 5' nucleotidase in lymphocytes, are sensitive indicators of zinc deficiency. Serum active thymulin and generation of Th1 cytokines, IL-2 and IFN-γ and their mRNAs are most sensitive indicators of acute zinc deficiency. We have now established a new method of zinc assay in nails and plasma by LIBS (laser induced background spectroscopy) technique which is simple, exportable and cost effective and is an excellent indictor of chronic human zinc deficiency.

Biography

Ananda S Prasad has been at Wayne State University since 1963 when he took a position as Director of the Division of Hematology, a post he held until 1984 when he became the Director of the Division of Research. He has also been a Professor of Medicine at Wayne from 1968 until the present. He was appointed as Distinguished Professor of Medicine, Division of Hematology-Oncology in 2000. He is author of twelve books and over three hundred scientific articles. He has received many awards, which include Medal of Honor from the Mayor of Lyon, France, Honorary Doctorate from Claude Bernard University, France, election as corresponding member of The European Academy of Sciences, Arts and Humanities, and American College of Physicians' (ACP) highest award for outstanding work in science as related to Medicine. In 2010, he received the prestigious Mahidol Award from Royal Highness King of Thailand for his discovery of zinc as an essential element for human health. In 2011, he received a Congressional Commendation for his lifelong studies involving zinc as an element essential for human survival. In May of 2012, he received The Lawrence M. Weiner Award, honoring outstanding contributions of non-alumni to the School of Medicine through the exceptional performance of his research at Wayne State University. Most recently, The American College of Nutrition will honor him as a distinguished Professor of Internal Medicine, with its 2014 Alexander and Mildred Seelig Magnesium Award.

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