Impact of the discovery of human zinc deficiency on health.

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BACKGROUND: The essentiality of zinc was recognized 46 years ago. Zinc deficiency resulting in growth retardation, hypogonadism, immune dysfunction and cognitive impairment affects nearly 2 billion subjects in the developing world. High phytate content of the cereal proteins consumed in the developing world, results in decreased availability of zinc for absorption.

FINDINGS: Zinc therapy has been very successful and life saving measure in patients with acrodermatitis enteropathica and Wilson’s disease. Beneficial therapeutic responses of zinc supplementation have been observed in acute diarrhea in children, chronic hepatitis C, shigellosis, leprosy, leishmaniasis, and common cold. Zinc supplementation was effective in decreasing incidences of infection in elderly and patients with sickle cell disease. Zinc supplementation was effective in preventing blindness in 25% of the elderly with dry type of age related macular degeneration. Zinc supplementation in the elderly decreased oxidative stress and decreased generation of inflammatory cytokines. Zinc is an intracellular signaling molecule in monocytes, dendritic cells and macrophages and it plays an important role in cell-mediated immune functions and oxidative stress. Zinc is also an anti-inflammatory agent. These unique properties of zinc may have significant therapeutic benefits in several diseases in humans. In many diseases concurrent zinc deficiency may complicate the clinical features, affect adversely immunological status, increase oxidative stress and increase generation of inflammatory cytokines.

CONCLUSION: Oxidative stress and chronic inflammation may play important causative roles in many chronic diseases, including atherosclerosis, several malignancies, neurological disorders, and auto-immune diseases. It is therefore, important that status of zinc is assessed and zinc deficiency corrected in these chronic diseases. A controlled clinical trial of zinc supplementation in these disorders in order to document the preventive and therapeutic effects of zinc is warranted.

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