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Zinc and the Common Cold: Are We Close to a Cure?

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The common cold is one of most frequent ailments affecting humans. In spite of the dramatic impact of such illness on our lives, scientists have not been able to achieve a cure. Several nutritional adjustments and supplements as well as a variety of pharmacological agents have been tried with not much success. The two most common supplements assessed in this regard are ascorbic acid and zinc.

The role of zinc in human nutrition has long been established.[1] The daily recommended dietary allowance for zinc is 15 mg. Zinc is involved in many biochemical functions related to protein synthesis, spermatogenesis, and platelet reactivity and plays a crucial role in maintenance of vigorous cellular immunity[2] and the prevention of certain types of cancer.[3] The causes of zinc deficiency include malnutrition, alcoholism, malabsorption, liver cirrhosis, chronic renal disease, extensive burns, the use of chelating agents such as penicillamine for Wilson's disease, and certain genetic disorders such as sickle cell disease and acrodermatitis enteropathica.[4] The highest content of zinc in our diet is in meat products, including beef and chicken.[5] Certain populations in developing countries suffer from the consequences of nutritional zinc deficiency.[6] In the Western world, however, certain subgroups of the population, such as adolescents, pregnant women, and nursing home residents, are at risk for the same problem.[7] In addition, the intentional avoidance of red meat by some individuals increases the risk of zinc deficiency.[8] The clinical manifestations of zinc deficiency include growth retardation, male hypogonadism, delayed wound healing, bullous dermatitis, diarrhea, and intercurrent infections.[4] Administration of zinc in therapeutic doses (150 mg/d) to patients with sickle cell anemia significantly reduced irreversible sickling and helped healing of skin ulcers, but resulted in neutropenia due to induction of copper deficiency.[9] This has suggested a role for zinc therapy in patients with Wilson's disease.[10]

Several studies have demonstrated that zinc prevents the formation of viral capsid proteins, thereby inhibiting in vitro replication of several viruses, including herpes simplex virus,[11] foot and mouth disease virus,[12] poliovirus,[13] and rhinovirus.[14] Other mechanisms by which zinc might affect the common cold include preventing rhinovirus from binding to the tissue surface protein intracellular adhesion molecule type 1,[15] stabilizing cell membranes,[16] inhibiting prostaglandin metabolism,[17] and inducing interferon gamma production.[18] Well designed studies in the literature on the role of zinc in the treatment of common cold have had conflicting results.[19–25] Nevertheless, zinc gluconate glycine lozenges, when started within 24 h of the onset of symptoms of common cold, significantly reduced the duration of illness in general and had a clear therapeutic effect on most of the individual symptoms.[26] The most common side effects were nausea and bad taste reactions. This study had certain limitations, the most important of which is lack of microbiologic documentation of infection or cure. In the later study, patients were instructed to take one zinc lozenge every 2 h while awake, i.e., about eight lozenges per day, but actually took only five; raising concerns about compliance with such therapy.

Whether zinc may exert its therapeutic effect on colds by correcting a subclinical zinc deficiency in certain people remains to be determined. Long-term surveillance studies for potential efficacy and toxicity are needed before widely accepting such therapy. If adopted, zinc might potentially be used by every human being for therapy of a very common illness.

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