Zinc: The Importance in Human Life

Dr. Vidyavati SD1, Dr. Sneha A2, Dr. Katti SM3

1Asst. Professor, Dept. of Community Medicine, USM-KLE-IMP- Belgaum, Karnataka
2Intern, J.N. Medical College, Belgaum, Karnataka
3Prof. & Head, Dept. of Community Medicine, J.N. Medical College, Belgaum, Karnataka

Correspondence author: Dr. Vidyavati SD

Abstract

Zinc is second most trace mineral in the body after iron. Zinc is component of numerous enzymes. It has catalyzed structural & regulatory role. It is also component of hormones like insulin, growth hormone & sex hormone. In 1961 importance of zinc for human body was recognized. Many researchers were done to identify role of zinc in human body. A systematic search was done to find importance of zinc. About 2 mgs of zinc is found in human body. This is distributed as muscles 60%, bones 30% & remaining 10% skin, hair, plasma. Zinc deficiency causes growth retardation in children still birth, spontaneous abortion in pregnant woman immunity both mother & body, repeated respiratory infections, alopecia, depression lack of concentration, skin infections, diarrhea lack & so on, oral & genital ulcers may occurs.

Key words: Zinc, Human life, Importance

Introduction

More than 50 chemical elements are found in the human body which is required for growth, repair & regulation of vital function they are

a) Major minerals – calcium, phosphorous, sodium potassium & magnesium.

b) Trace elements – There are elements required by the body in quantities less than few milligrams per day. Ex – Iron, iodine, fluorine, zinc, copper, cobalt, chromium, manganese, molydecem, selenium nickel, silicon & vanidicem.

c) Trace elements no known function – lead mercury barium, alceminicem.

Zinc has catalytic, structural & regulatory actions. Zinc is metal present in all cells. It is co-factor for more than 300 enzymes, and it is necessary for wide variety of biological functions. It is also component of more than 100 transcriptions factors. Ex – Zinc fingers in DNA. Zinc is required for synthesis of DNA, normal growth, gene expression, gene regulation, cell division, immunity. Deficiency of zinc may lead to many diseases more than 2 billion (2.5) in developing world are deficient of zinc. Zinc deficiency can be causative factor for increase in the infection & diarrhea leading to death of children about 80000 children all over world die due to zinc deficiency. Zinc is one of the most important essential trace element zinc & its requirement for growth was 1st recognized by roll line in 1869. In 1934 essentiality was found in rats, and in 1961 importance of zinc to human was recognized. Now it is confirmed. Zinc deficiency is common in developing countries & it is cause of preventable
diseases zinc can cause many infection – respiratory infections gastro intestinal infection, homeopathic, endocrine abnormalities, and can hamper many vital biological functions of the body. With this background in mind this paper is on attempt to make role of zinc in health and diseases. 

**Physiology**

Zinc in the body is bound to zinc Containing enzymes. This include carbonic anhydrous, car boxy peptidase A & B, alkaline phosphates glyceraldehyde alkaline phosphates, RNA, DNA polymerase. Zinc is required for both catalytic & Structural functions of the body. Zinc may activate or inhibit enzymes. Modify membrane functions. Zinc is needed by cells for all cellular components that are necessary for complex transport mechanism (Regulation of PH, metabolism of nutrients cell division, growth, immunity, defense against free radicles development of hair & nail). Zinc plays important role in taste & mental well being. It has indirect effect on vascular function. Zinc prospects body from toxic compounds X-ray & gamma radiation. Zinc is found in mossy fibs system of the brain hippo campus.

Researchers has shown that both zinc & anti-oxidants delay the progression of age related macular degeneration & vision loss possibly by preventing cellular damage in the retina. Treating with zinc for 10-14 days course can reduce the duration & severity of diarrheal episodes & may also prevent future episodes for up to 3 months.

**Food sources of zinc**

Zinc content of food various with content of the soil. Which food is growth with the content of fertilizer used. In general the availability of zinc is proportional to protein intake because muscle meat & sea food have highest zinc content & vegetable sources contain zinc. Same portion of zinc is lost during the process of milling cereals.

Grains – Bread, rye, noodles, bran flakes black sea sum is rich in 2 mc meat & fish - oysters & cell fish, lamb (high 4-6 ma) chicken, light meat, liver fish.

Veg / Fruits – Zinc is found in sunflower seed, almond veg, peas, lentils all type of beans nuts, highest peanut butter, fruits eaten cereals may increase bioavailability of zinc.

Dairy / Soya / Egg – Milk, whole, yogurt, cheese soya milk, mushroom, lily flowers, edible fungus, rice dates, cabbage, nuts supplements are zinc gluconate acetate.

**Causes of Zinc Deficiency**

Zinc deficiency is becoming public health problem. Deficiency can develop if the amount of zinc in diet is insufficient. Person may be having malabsorption liver cirrhosis, diabetes, renal problem, hemolytic anemia, and diarrhea.

Zinc is loss during process of milling cereals. If person is using such grains he is likely to suffer from zinc deficiency. Consuming foods containing additives chelating activity also causes. Zinc deficiency too much fiber, phytates in the food also can cause zinc deficiency.

Other causes of zinc deficiency can be gastrointestinal surgery, Cohan’s disease, and ulcerative clothes. Bowel syndrome chill disease absorption of zinc and loss of zinc from body.

Iron can interfere zinc absorption to reduce this effect iron supplements should be taken between meals to allow time for zinc to be absorbed. Now it is seen that zinc deficiency may be associated with some of malignancy, early sanctity & early onset of once life style disease. Zinc is present in all organs & fluids in the body. Zinc deficiency is more likely to develop
during childhood and adulthood, woman, pregnancy, weight reduction process berialric. All these are vulnerable for zinc deficiencies alcoholic have low zinc level because alcohol reduces the zinc absorption & increases the urine excretion of zinc. Research showed that zinc deficiency is more common where there is poor water sanitation personal hygiene, communicable diseases, poverty diarrhea, respiratory infections aloposia impaired reproduction. Physiological stress that results in increase in zinc loss in urine & this increases the requirement. Ex – Stress, burns, starvation, muscle wasting disease, alcohol consumption.

Drugs Causing Disturbances in Zinc Status
Diarrhea, chelating agents, antacids laxatives & iron supplements.

Zinc Toxicity –
Zinc is nontoxic because zinc content of most food is low. Dietary excess is conlifdy. Ingestion of zinc more than 150 mg per day can interfere with copper or iron metabolism. Myelopathy & pancytopenia can present with high zinc & low copper level. It can occur in acute & chronic forms. Symptoms like nausea vomiting, loss of appetite, abdominal cramps diarrhea, and headache. Chronic symptoms like low copper status altered iron function, reduced immune function & reduced level of high density lipoproteins.4,5,6

Conclusion
Zinc is also essential trace element for health used in diarrhea profrietrias, respiratory infections & malaria too. Zinc is essential for body’s good immune system, hormone secretion, mental well being fetal growth, normal body development. It is important to educate community & motivate to include animal food in their diet. Inclusion of veg food like wheat, cereals, maize increase zinc absorption.

References:
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