INTRODUCTION

The health and well being of children depends upon the interaction between their genetic potential and exogenous factors like adequacy of nutrition, safety of environment, social interaction. Nutrition has a global role to promote physical growth, enhance neuromotor development, boost host defences toward off common day- to- day infections and thus improve the quality of life ***(Maureen, 2003).***

Nutritional status of children over the years there have been significant changes in the clinical profile of nutrition- related disorders in developing countries. The florid cases of kwashiorkor, severe protein-energy malnutrition and various syndromes (like scurvy, rickets, pellagra, beri- beri etc) due to gross deficiencies of single nutrients have become rare. Nevertheless, there are still wide spread diseases of public health relevance due to deficiency of micronutrients like iron deficiency anemia, iodine deficiency disorders, zinc deficiency, copper deficiency, selenium deficiency and milder forms of vitamin A deficiency ***(Singh, 2004).***

Zinc is one of the most essential trace elements in the human body and as such, a member of one of the major subgroups of the micronutrients that have attained such prominence in human nutrition and health***. (Mason, 2006)***

Zinc has varied functions in humans, it has catalytic role in over one hundred specific metabolic enzymes in human metabolism***. (Bhutta and Dewraj, 2004).*** As a component of enzymes, known as metalloenzymes, zinc participates in the reaction in the active site or provides structural integrity to the enzyme, carbonic anhydrase was the first discovered zinc metalloenzyme; other enzymes include:

carboxypeptidase, Alkaline phosphatase, DNA/RNA polymerase and superoxide dismutase. ***(King and Cousins, 2006).***

One of the most important functions of zinc its essential role in hepatic synthesis of retinol binding protein, the protein involved in transporting vitamin A, without adequate zinc, symptoms of vitamin A deficiency can appear even if vitamin A supplements are taken Zinc also acts as antioxidant, restricting endogenous free radical production and act as structural component of the extra cellular antioxidant enzyme, super oxide dismutase. It also helps to protect against depletion of vitamin E. Other biochemical processes that require zinc include carbohydrate metabolism, protein digestion, blood clotting and bone metabolism***(Mason, 2006)***.

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Zinc is one of the most ubiquitous of all trace elements involved in human metabolism and plays multiple roles in the perpetuation of genetic material, including transcription of DNA, translation of RNA, and ultimately cellular division(***International Zinc nutrition Consultative Group,2004)***

Further more it plays a role in apoptosis and the integrity of biomembranes. A reduction in the concentration of zinc in these membranes results in increased susceptibility to oxidative damage and alteration in specific transport systems and receptor sites and these may underlie some of the disorders associated with zinc deficiency.

One of the most recent functions of zinc is its involvement in the structure of proteins in the human genome, known as **"Zinc Finger proteins",** these proteins are able to interact with DNA and act as transcriptional mediator.

Zinc – finger family of proteins is one of the most common families of transcription factors in eukaryotic cells and has more than 3.000 members in the human genome. They are known to play a key role in regulating expression of genes important for cell growth, proliferation, differentiation and apoptosis. Owing to their multiple functions, some zinc- finger proteins are powerful regulators in the development of the tumor. However, the role of the remainders of the zinc- finger family in tumor development is not clear yet. ***((Samman, 2007***)

The human body contains about 2 gm of zinc, approximately 95% of this zinc is found within cells. About 57% of the body pool is stored in skeletal muscle, 29% in bone and 6% in skin the remaining of zinc is found in all body fluids and tissues .***(Mason, 2006).***