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B١٧٦٠٨

A STUDY ON THE EFFECT OF SOME FOOD ITEMS RICH IN ZINC ON IMMUNITY AND RESISTANCE TO MICROBIAL INFECTION IN EXPERIMENTAL MICE

BY

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A THESIS

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TO

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LIST OF ABBREVIATIONS

DNA	Deoxy Ribonucleic Acid
RNA	Ribonucleic Acid
Conc.	Concentration
S.e	Standard error
Pr%	Protein ratio
Ses. s.	Sesame seed
Ses. P.	Sesame powder
Ses. oil	Sesame oil
RBC_s	Red Blood Cells
WBC_s	White Blood Cells
SGoT	Serum Glutamic Oxalloacetic Transaminase
SGpT	Serum Glutamic Pyruvic Transaminase

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Introduction and Aim of the Study

INTRODUCTION

Zinc is present in and essential to most forms of life. In higher mammals zinc is second in abundance only to iron among the trace elements.

Under ideal conditions the average adult body contains 2.3 grams of zinc compared with 4 grams of iron. Most organs, muscles, glands and bone contain zinc in varying quantities with the highest concentration in the prostate and associated secretions, in the tissues of the eye and most of the membranes. Less than 10% of body zinc is found in extra-cellular fluids and blood serum. The zinc content of serum decreases in conditions where intestinal uptake is reduced for whatever reason or diseases such as myocardial infarction, infections, malignancies and hepatitis. This supports the contention that the serum zinc is drawn upon as a store. The store however is small and there is an absolute necessity for a daily input of systemic zinc (as opposed to dietary).

Experiments show that normal body functions can be maintained for about 3 weeks from the time of ceasing intake, commencing with systemic zinc at maximum using gastric infiltration to ensure, that condition. It appears that during this time not only is zinc taken from the serum but also the mucous membranes. Once membrane zinc concentrations have become

reduced they present fertile ground for viral attachment.

Zinc is essential for the catalytic and structural function and stability of more than 300 distinct enzymes, which participate in biological reactions encompassing the synthesis and degradation of all the major metabolites and as a component of the immune response.

Zinc is also known to play an essential role in gene expression with acrodermatitis-enteropathica being a good example. This aberrant inherited gene can be controlled with zinc even when the victim is unable to absorb properly by using passive gastric infiltration. In particular, this trace metal has been discovered to play structural and functional roles in several proteins involved in DNA replication and reverse transcription, where the potential metal binding domains are referred to as zinc fingers-referring to the implied electronic effect. In addition, zinc is involved in the stabilization of protein and nucleic acid structures, in preserving the integrity of sub-cellular organelles and in various vital and immune response phenomena, strange to relate, it is not known how zinc performs, its electron bonding not permitting of chemical reaction in the weak body fluids. In the absence of this knowledge it is referred to as being in an 'entatic state' or poised in a condition of 'tension or stress'.

The roles of zinc in metalloenzmes can be divided into three categories: catalytic, structural and regulatory. The main

reasons for sub-normal systemic zinc are poor absorption or zinc deficient diets. Poor absorption, which is the most common, is due either to innate disability or antagonists in the di*et* Precipitating substances derived from the diet are a major factor affecting intestinal absorption of metal ions.

Fiber has also been found to be responsible for preventing the absorption of most minerals. In a balanced study, the diets of two adults were changed from one of low fiber to one of high fiber content. Calcium, magnesium, zinc and phosphorous absorption were all decreased.

Zinc obviously has a major role in the immune response generally and including gene expression, protein synthesis, DNA and RNA polymerases, glucose metabolism, brain enzymes, reproductive function sand various hormones. This names just a few of the many aspects in which zinc is intimately concerned **(Prasad, 1998)**

AIM OF THE STUDY

In this study experimental mice were fed on different diets containing various plant and animal protein sources **rich in zinc at the aim of:**

1- Studying their effect on the general health status including body and internal organs weight, liver and kidney functions and blood pictures

2- Studying their effect on the improvement of the immune status via resisting the microbial infection and its effects on the general body performance, clinical and histopathological changes.