THE ROLE OF VITAMIN E AND ZINC ON CADMIUM INDUCED INJURY OF THE ALBINO RAT TESTES AND KIDNEYS. A HISTOLOGICAL AND HISTOCHEMICAL STUDY

A Thesis

Submitted For Partial Fulfillment Of Master Degree In **Histology**

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بسوالله الرحمن الرحيم

الحمد ش الذي هدانا لهذا و ما كنا لنهتدي لولا أن هدانا الله

حدق الله العظيم

(سورة الأعراف الآية ٤٣)



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Abbreviations and Glossary

Cd cadmium

vit E vitamin E

Zn zinc

ttt treated

PCTs proximal convoluted tubules

DCTs distal convoluted tubules

SNTs seminiferous tubules

+ve positive

gr group

E/M electron microscopy

MT metallothionein

IP intraperitoneal

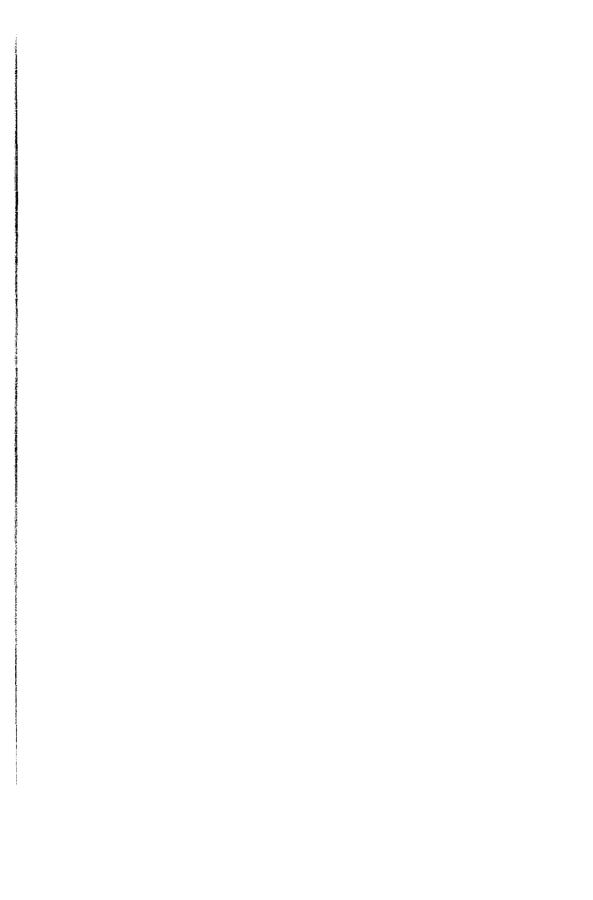
SC subcutaneous

L liter

CONTENTS

F	Page
♦ Introduction and aim of the work	. 1
♦ Review of Literature	4
♦ Material and methods	- 13
♦ Results	24
♦ Kidney	- 24
• Testis	72
♦ Discussion	109
♦ Kidney	109
♦ Testis	118
♦ Summary and conclusion	125
♦ Abstract	130
♦ References	131
♦ Arabic summary	

INTRODUCTION AND AIM OF THE WORK



INTRODUCTION

Among the most common hazards found nowadays in the environment is pollution with the toxic metals.

Toxic metals have been shown to affect almost every organ of the body. The chances of serious damage increase with continued exposure due to their poor excretion (Goyer, 1996).

Several metals have been found to produce both acute and chronic tissue injury in humans and animals. An example of such a toxic metal is cadmium.

Cadmium is a new toxic metal and its sources of environmental pollution are variable.

In industry, its use was minor until about 50 years ago, but now it is a very important metal with many industrial applications. Its main use is electroplating, color pigment for paints and plastics, and cathode material for nickel-cadmium batteries. Also cadmium is a byproduct of zinc and lead mining which are one of important sources of environmental pollution with cadmium (Doull, Amdur, Curtis, and Klaassen, 1986).

In addition, cigarettes are a major non occupational source for cadmium pollution (1-2 μ g cadmium/cigarette). Air borne cadmium in urban areas is generally 0.03 to 0.06 μ g/m³ (Kneip, Eisenbud, Strehlow and Freudenthal, 1970).

On the other hand, exposure to cadmium have increased in the last 20 years because of the wide use of fertilizers rich with cadmium e.g., sewage sludge (George, Clayton, and Florence, 1994). Therefore, increased cadmium levels have been reported in tissues of animals fed on grass gown in soil fertilized with sewage sludge (Miller and Boswell, 1981).

So, the food is the principal source of cadmium exposure for humans (Friberg, Piscator, Nordberg, and Kjellstrom, 1974). Meat, fish, fruit and especially liver and kidneys of animals contain high concentration of cadmium. Also shellfish may be a major source of dietary cadmium (Doull, et al., 1986).

The total daily intake of cadmium from food, water and air in North America and Europe is estimated to be about 10 to 40 µg/day (Doull, et al., 1986).

The effects of inorganic cadmium on human health had attracted considerable attention in the last 20 years. Much of this attention had been the result of the discovery of a disease called Itai-Itai (Pain-Pain) reported from Japan by Hogino and Yoshioka (1961)among people exposed cadmium to in