# TRACE ELEMENTS IN INSULIN DEPENDENT DIABETES MELLITUS (IDDM)

THESIS

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of the Master Degree

In

Pediatrics

By

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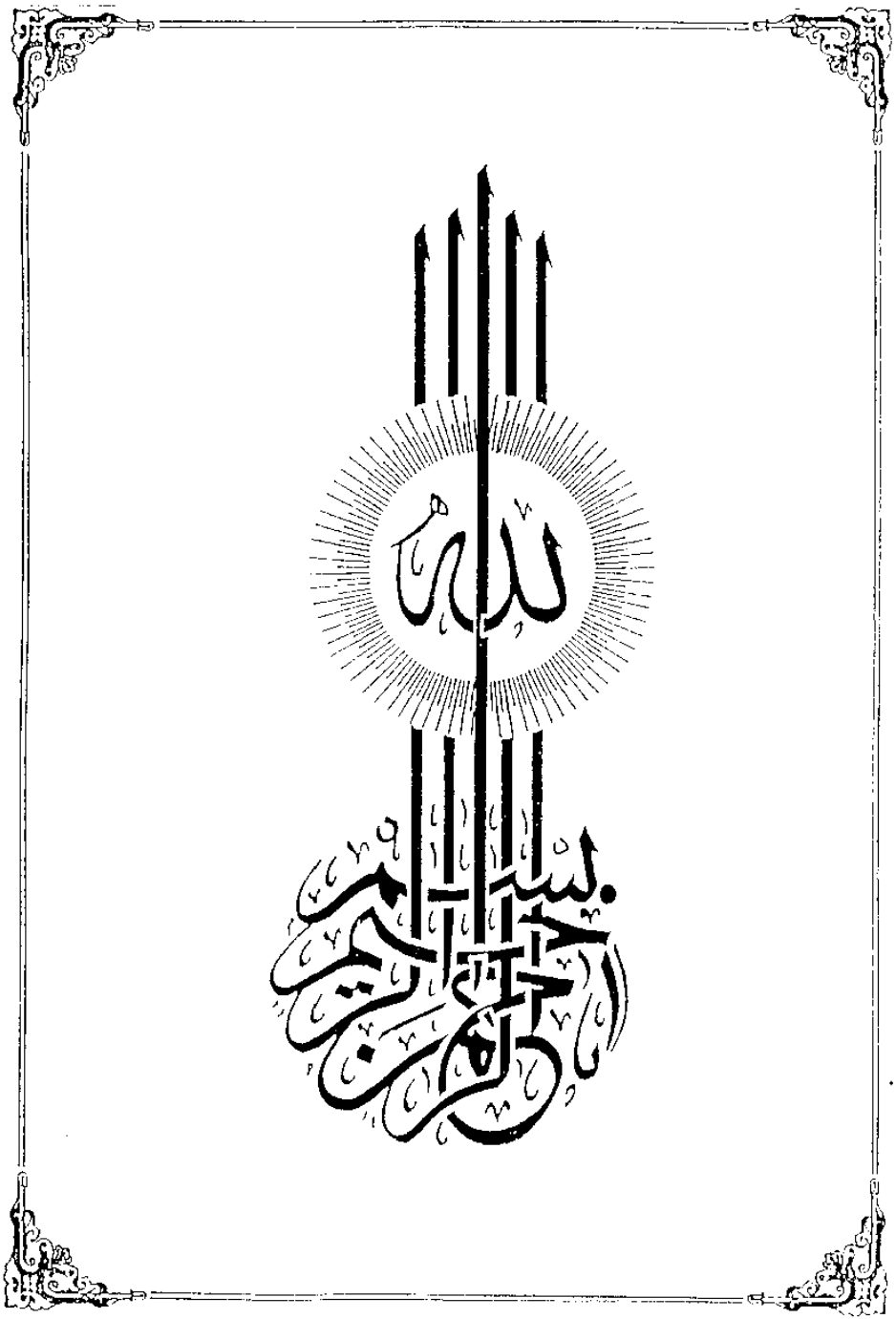


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# C O N T E N T S


Page

- Introduction and Aim of the Work ..... 1
- Review of Literature ..... 3
  - Insulin dependent Diabetes Mellitus ..... 3
  - An Introduction on Trace Elements ..... 25
  - Manganese and Diabetes ..... 28
  - Zinc and Diabetes ..... 37
  - Selenium and Diabetes ..... 48
- Material and Methods ..... 60
- Results ..... 78
- Discussion ..... 97
- Summary and Conclusion ..... 106
- Recommendations..... 109
- References ..... 110
- Arabic Summary ..... 152


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# L I S T  OF  T A B L E S


| | | Page |
|---|---|---|
| Table (1). | Classification of Diabetes Mellitus (NDDG, 1979)..... | 6 |
| Table (2). | Clinical Characteristics of the Two Major Types of Diabetes Mellitus (NDDG, 1979) .... | 7 |
| Table (3). | Classification of D.M. and Other Categories of Glucose Intolerance (After WHO, 1985) ..... | 9 |
| Table (4). | Value of Manganese in Some Food Products ..... | 29 |
| Table (5). | Value of Zinc in Some Food Products .... | 41 |
| Table (6). | Estimated Safe and Adequate Daily Dietary Intake of Selenium..... | 52 |
| Table (7). | Clinical Data of Diabetic Patients ..... | 85 |
| Table (8). | Clinical Data of the Control Group ..... | 86 |


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Page


Table (9). Values of Blood Glucose, Total Serum Protein, Serum Albumin and Albumin/Globulin Ratio in Insulin Dependent Diabetes Mellitus Patients.... 87

Table(10). Values of Blood Glucose, Total Serum Protein, Serum Albumin and Albumin/Globulin Ratio in Control Group ..... 88

Table(11). Values of Serum Selenium, Zinc and Manganese in Insulin Dependent Diabetes Mellitus Patients ..... 89

Table(12). Values of Serum Selenium, Zinc and Manganese in Control Group ..... 90

Table(13). Values of Blood Glucose in Diabetic Patients in Comparison to the Control Group ..... 91

Table(14). Values of Serum Proteins and Serum Albumin and Albumin/Globulin Ratio in Diabetic Patients in Comparison to the Control Group ..... 91

Table(15). Values of Serum Selenium, Zinc and Manganese in Diabetic Patients in Comparison to the Control Group ..... 92

Table(16). Correlations Between Clinical Data and Laboratory Data in Diabetic Patients ... 93


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# L I S T  OF  F I G U R E S


| | | Page |
|---|---|---|
| Figure I. | Schematic Presentation of the Single Beam Atomic Absorption Spectrophotometer..... | 68 |
| Figure II. | A Histogram Showing the difference in the Random Glucose Level Between Diabetic Patients and The Control Group..... | 94 |
| Figure III. | A Histogram Showing the Total Serum Protein and Serum Albumin in Diabetic Patients and The Control Group..... | 94 |
| Figure IV. | A Histogram Showing the difference in Serum Levels of Selenium, Zinc and Manganese Between Diabetic Patients and The Control Group..... | 95 |


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# L I S T  OF  A B B R E V I A T I O N S

| | |
|---|---|
| - Albumin/Globulin Ratio. | A/G Ratio. |
| - Atomic Absorption. | A.A. |
| - Copper. | Cu. |
| - Glutathione Peroxidase. | GSH. PX. |
| - Glycosylated Hemoglobin. | Hb AlC |
| - Insulin Dependent Diabetes Mellitus. | IDDM. |
| - Islet Cell Surface Antibodies. | ICSA |
| - Manganese. | Mn. |
| - National Bureau of Standards. | NBs. |
| - National Diabetes Data Group. | NDDG. |
| - National Institute of Health | NIH |
| - Natural Killer. | NK. |
| - Phenylketonuria. | PKU. |
| - Printer-Squencer. | PRS. |
| - Selenium. | Se. |
| - Solvent Extraction Graphite Furnace. | H.G.A. |
| - Superoxide Dismutase. | SOD. |
| - Teletypewriter Readout. | T.R. |
| - Volume/Volume. | V/V. |
| - World Health Organization. | WHO. |
| - Zinc. | Zn. |

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# INTRODUCTION AND AIM OF WORK

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# INTRODUCTION

Insulin dependent diabetes mellitus (IDDM) is considered to be the commonest endocrinal disorder in childhood, here comes the importance of studying all its aspects (Porte and Halter, 1981).

There is accumulating evidence that the metabolism of several trace elements is altered in IDDM. Hence, these nutrients might have specific roles in the pathogenesis of this disease.

Increased urinary loss of zinc is a commonly encountered feature of diabetes (Tuvemo and Gebre-Medhin, 1985).

Selenium is involved in processes which protect the cell against oxidative damage by peroxidases produced from lipid metabolism.

There is very few reports about the role of selenium in diabetics (Gebre-Medhin et al, 1984).

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Current knowledge does not implicate manganese in the pathophysiology of diabetes mellitus. However, its role must constitute a challenging area for further clinical research.

## A I M  O F  T H E  W O R K

The aim of the work is to study the role of Manganese, Selenium and Zinc in insulin dependent diabetes mellitus since reports are rather deficient about their role in this syndrome.

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# REVIEW OF LITERATURE

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## Insulin Dependent Diabetes Mellitus

## I.D.D.M.

### Definition

Insulin dependent diabetes mellitus (IDDM) is a syndrome characterized by sudden clinical onset of severe hyperglycemia and easy appearance of ketoacidosis and severe insulin deficiency (Gorsuch et al, 1981). It was reported that IDDM is the commonest endocrinal disorder in childhood with frequent secondary complications (Porte and Halter, 1981)and (Sperling, 1984).

IDDM defines a group of patients who are usually, but not necessarily, under 30 years of age at the time of diagnosis. They generally present with accelerating history of glucosuric symptoms for less than three months. They are thin and almost invariably exhibit weight loss. Only rarely, such patients are discovered by testing for diabetes when they are asymptomatic; if so they may decompensate soon (Fajans et al, 1976). This defines their state of absolute insulin dependency (Genuth, 1982).

A positive family history of diabetes is uncommon, only 10 percent of such patients have either a diabetic parent or a diabetic sibling (Fajans et al, 1978).

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