

STUDY ON THE EFFECT OF RICKETS ON SKELETAL MUSCLE

Thesis

**Submitted in the Fulfilment of
Ph. D. Degree
Childhood Studies**

By

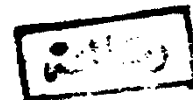
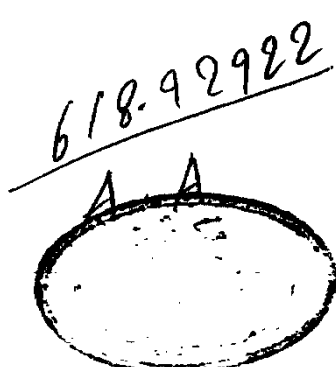
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CONTENTS

	Page
List of Abbreviations.	i
List of Figures	ii
List of Tables	iv
I. INTRODUCTION	1
II. REVIEW OF LITERATURE	3
II.1. VITAMIN D	3
II.1.a. Sources of vitamin D	3
II.1.b. Metabolism of vitamin D	4
II.1.c. Metabolic fate and excretion	8
II.1.d. Circulating vitamin D metabolites .	9
25 - hydroxy vitamin D	11
1,25-dihydroxy vitamin D	13
25,25-dihydroxy vitamin D	25
25,26-dihydroxy vitamin D	27
II.1.e. Actions of vitamin D	27
II.1.f. Mechanism of regulation of vitamin D hydroxylases	40
II.2. SERUM ENZYMES RELATED TO BONE AND MUSCLE METABOLISM	42
II.2.a Alkaline phosphatase	42
II.2.b. Creatine phosphokinase	46
II.2.c. Lactate dehydrogenase	48
II.2.d. Aldolase	50
II.3. RICKETS	51
II.3.a. Classification	52
II.3.b. Vitamin D deficiency rickets	53
II.3.c. Metabolic bone disease of prematurity	72
II.3.d. Adolescent Asian rickets	76
II.3.e. Rickets due to malabsorption	77

CONTENTS (Cont.)

	Page
II.3.f. Rickets in hepatic diseases	77
II.3.g. Rickets due to renal glomerular destruction	78
II.3.h. Rickets in patients on anticonvulsant therapy	79
II.3.i. Vitamin D dependent rickets	80
II.3.j. Familial hypophosphatemic rickets .	81
II.3.k. Fanconi syndrome	83
II.3.l. Hypophosphatasia	84
II.3.m. Vitamin D Toxicity	85
II.4. ELECTROMYOGRAPHY (EMG)	87
III. MATERIAL AND METHODS	89
IV. RESULTS AND DISCUSSION	100
V. SUMAMRY AND CONCLUSION	167
REFERENCES	173
ARABIC SUMMARY	

ABBREVIATIONS

25-OHD	: 25-hydroxy vitamin D
1,25 (OH) ₂ D	: 1,25-dihydroxy vitamin D
24,25 (OH) ₂ D	: 24,25-dihydroxy vitamin D
25,26 (OH) ₂ D	: 25,26-dihydroxy vitamin D
Ca	: Calcium
P	: Phosphorus
AP	: Alkaline phosphatase
CPK	: Creatine phosphokinase
LDH	: Lactate dehydrogenase
Ca BP	: Calcium binding protein
DBP	: Vitamin D binding protein
PTH	: Parathormone
ECF	: Extracellular fluid
SD	: Standard deviation
UV	: Ultraviolet
Wt/age	: Weight per age
L/age	: Length per age
Wt/L ²	: Weight per length ²
HC/age	: Head circumference per age
CC/age	: Chest circumference per age
H/C	: Head per chest ratio

LIST OF FIGURES

	Page
- II.1.(b) Fig. (1): The mechanism of 25-hydroxylation of vitamin D ₃ to produce 25-OHD ₃ by hepatic microsomes	5
- II.1.(b) Fig. (2): Mechanism of 1 α -hydroxylation of 25-OHD ₃ by chick kidney mitochondria	6
- II.1.(d) Fig. (3): The known metabolism of vitamin D ₃	10
- II.1.(e) Fig. (4): A model of a columnar epithelial cell from the gut depicting the variety of effects 1,25 (OH) ₂ D exerts on the cell	31
- IV.1. Fig. (1): Mean ($\pm$ SD) of percentage weight / age of the studied groups	107
- IV.1. Fig. (2): Mean ($\pm$ SD) of percentage length/ age of the studied groups	110
- IV.1. Fig. (3): Mean ($\pm$ SD) of percentage head circumference/age of the studied groups	112
- IV.1. Fig. (4): Mean ($\pm$ SD) of percentage chest circumference/age of the studied groups	114
- IV.2. Fig. (1): Mean ($\pm$ SD) social score of the studied groups	121
- IV.2. Fig. (2): Correlation between social score and percentage weight/age	122
- IV.2. Fig. (3): Correlation between social score and percentage length/age	123
- IV.2. Fig. (4): Correlation between social score and percentage weight/length ²	124
- IV.2. Fig. (5): Correlation between social score and percentage chest circumference/age	125
- IV.4.(a) Fig. (1): Mean ($\pm$ SD) of serum phosphorus levels of the studied groups	135
- IV.4.(a) Fig. (2): Correlation between serum phosphorus and calcium levels in all groups	137

LIST OF FIGURES (Cont.)

	Page
- IV.4.(a) Fig. (3): Correlation between serum phosphorus and alkaline phosphatase levels in all groups .	138
- IV.4.(a) Fig. (4): Correlation between serum phosphorus and aldolase levels in all groups	139
- IV.4.(a) Fig. (5): Correlation between serum phosphorus and 25-OHD levels in all groups	140
- IV.4.(b) Fig. (6): Mean ($\pm$ SD) of serum calcium levels of the studied groups	142
- IV.4.(b) Fig. (7): Correlation between serum 25-OHD and calcium levels in all groups .	143
- IV.4.(c) Fig. (8): Mean ($\pm$ SD) of serum alkaline phosphatase levels of the studied groups	145
- IV.4.(c) Fig. (9): Correlation between serum 25-OHD and alkaline phosphatase levels in all groups	146
- IV.5. Fig. (1): Mean ($\pm$ SD) serum creatine phosphokinase levels of the studied groups	151
- IV.5. Fig. (2): Mean ($\pm$ SD) of serum lactate dehydrogenase levels of the studied groups	153
- IV.5. Fig. (3): Mean ($\pm$ SD) serum levels of aldolase of the studied groups ...	155
- IV.6.(a) Fig. (1): Mean ($\pm$ SD) serum levels of 25-OHD in the studied groups	163
- IV.6.(b) Fig. (2): Mean ($\pm$ SD) serum levels of 1,25 (OH) ₂ D in the studied groups	166

LIST OF TABLES

		Page
- IV.1.	Table (1): Mean age of the studied groups. Statistical comparison between the groups	105
- IV.1.	Table (2): Percentage weight/age of the studied groups, statistical comparison between the groups ...	106
- IV.1.	Table (3): Percentage weight/length ² of the studied groups. Statistical comparison between the groups ...	108
- IV.1.	Table (4): Percentage length/age of the studied groups, statistical comparison between the groups ...	109
- IV.1.	Table (5): Percentage head circumference/age of the studied groups. Statistical comparison between the groups	111
- IV.1.	Table (6): Percentage chest circumference/age of the studied groups. Statistical comparison between the groups	113
- IV.1.	Table (7): Head/Chest ratio of the studied groups. Statistical comparison between the groups	115
- IV.2.	Table (1): Social score of the studied groups. Statistical comparison between the groups	120
- IV.4.(a)	Table (1): Serum phosphorus levels of the studied groups. Statistical comparison between the groups ...	134
- IV.4.(a)	Table (2): Statistical correlations between phosphorus and other biochemical parameters	136
- IV.4.(b)	Table (3): Serum calcium levels of the studied groups. Statistical comparison between the group	141
- IV.4.(c)	Table (4): Serum alkaline phosphatase levels of the studied groups. Statistical comparison between the groups	144

LIST OF TABLES (Cont.)

	Page
- IV.5. Table (1): Serum creatine phosphokinase levels in the studied groups. Statistical comparison between the groups	150
- IV.5. Table (2): Serum lactate dehydrogenase levels in the studied groups. Statistical comparison between the groups	152
- IV.5. Table (3): Serum aldolase levels in the studied groups. Statistical comparison between the groups ...	154
- IV.6.(a) Table (1): Serum 25-hydroxy-vitamin D levels in the studied groups. Statistical comparison between the groups	162
- IV.6.(a) Table (2): Correlations between 25-hydroxy-vitamin D and other biochemical parameters	164
- IV.6.(b) Table (3): Serum 1,25-dihydroxy-vitamin D levels in the studied groups. Statistical comparison between the groups	165

INTRODUCTION

I. INTRODUCTION

Rickets is now recognized as a systemic disease affecting not only bones but also other systems of the body particularly the muscles.

Vitamin D was found to have a specific function in muscle which might, perhaps, be mediated by 25-oHD. (Pointon et al, 1979). Vitamin D depletion has been found to produce a defect in skeletal muscle contraction and relaxation that are dependent on changes in blood mineral composition (Boland, 1985).

Paucity of reports that deal with muscle status of rachitic children encouraged us to study the relationship between vitamin D deficiency and muscle status of the rachitic children. This was accomplished by studying the electromyographic pattern of the rachitic children, serum levels of the enzymes that can be released in excess from injured muscle and serum levels of 25-oHD and 1,25 (oH)₂D. Besides, serum levels of alkaline phosphatase, phosphorus and calcium have been measured.

It is well known that vitamin D plays a major role in regulating calcium and phosphorus homeostasis. This function of vitamin D is mediated through its hormonal form 1,25(oH)₂D which is 10 times more active than

vitamin D itself and exerts its effect on many organs and tissues of the body (Deluca and Schnoes, 1983).

Studies concerning the levels of $1,25(\text{OH})_2\text{D}$ in nutritional rickets dealt with a limited number of cases. Another aim of this work is to study the serum levels of $1,25(\text{OH})_2\text{D}$ and 25-OHD which are the two most active metabolites of vitamin D in some of the Egyptian rachitic children at different stages of rickets and compare them with changes in serum levels of muscle enzymes, if any.

As rickets is still a prevalent disease in Egypt (Awraad et al, 1975 & Abd-El-Fattah, and El-Rafie 1977) as well as in tropical and North African countries (Srikantia, 1984), where enough sunshine can be received, we have studied the socioeconomic and environmental conditions of the rachitic children which may participate in the occurrence of rickets in sunny Egypt.

REVIEW
OF
LITERATURE