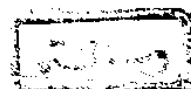


A STUDY OF 1,25 DIHYDROXYCHOLECALCIFEROL
IN RACHITIC EGYPTIAN INFANTS

THESIS

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C O N T E N T S

	Page
LIST OF ABBREVIATIONS.....	i
LIST OF FIGURES.....	ii
LIST OF TABLES.....	iv
INTRODUCTION AND AIM OF THE WORK.....	1
REVIEW OF LITERATURE.....	3
- VITAMIN D.....	3
- Sources.....	3
- Requirements.....	4
- Metabolism.....	6
- Functional significance of vitamin D meta- bolites.....	14
- Actions of 1,25 dihydroxyvitamin D.....	19
- Regulation of vitamin D metabolism.....	30
- Factors affecting vitamin D status.....	37
- Vitamin D in human milk.....	45
- Preparations of vitamin D.....	47
- Measurement of vitamin D and its major metabolites.....	49
- RICKETS:	54
- Vitamin D deficiency rickets.....	54
- Metabolic bone disease of prematurity.....	66
- Congenital rickets.....	67
- Adolescent Asian rickets.....	68
- Rickets due to malabsorption.....	68
- Rickets in hepatic diseases.....	69

	Page
- Anticonvulsant therapy and rickets.....	70
- Vitamin D dependent rickets.....	73
- Familial hypophosphatemic rickets.....	74
- Fanconi Syndromes.....	76
- Oncogenous rickets.....	78
- Hypervitaminosis D.....	78
MATERIAL AND METHODS.....	83
RESULTS.....	103
DISCUSSION.....	132
SUMMARY AND CONCLUSIONS.....	147
REFERENCES.....	152
ARABIC SUMMARY.	

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ABBREVIATIONS

25 OH ₂ D	25 hydroxyvitamin D
1,25(OH) ₂ D	1,25 dihydroxyvitamin D
24,25(OH) ₂ D	24,25 dihydroxyvitamin D
25,26(OH) ₂ D	25,26 dihydroxyvitamin D
IL ₁	Interleukin 1
IL ₂	Interleukin 2
IL ₃	Interleukin 3
T ₃	Triiodothyronine
FeCa	Fractional excretion of calcium
U	Urinary
S	Serum
PTH	Parathormone
UV	Ultraviolet
AP	Alkaline phosphatase
P	Phosphorus
Ca	Calcium
X	Mean
SD	Standard deviation
A	Active
Hg	Healing
Hd	Healed
F	Female
M	Male
CaBP	Calcium binding protein
DHT	Dihydrotachysterol
25 OH ₂ DHT	25 hydroxydihydrotachysterol.

LIST OF FIGURES

	Page
Fig.1 : Irradiation formation of vitamin D ₃	5
Fig.2 : Metabolism of vitamin D	7
Fig.3 : The 1 α hydroxylase system which forms 1 α ,25-dihydroxyvitamin D ₃ from 25-hydroxy- vitamin D ₃	9
Fig.4 : Chemical structures of vitamin D ₃ metabolites	11
Fig.5 : Working hypothesis for 1,25(OH) ₂ D ₃ mechanism	17
Fig.6 : Model for regulation of the biosynthesis of 1,25(OH) ₂ D ₃	32
Fig.7 : Relationship between breast milk vitamin D and vitamin D intake.....	44
Fig.8 : Effect of sun exposure and breast milk vit- amin D, on the vitamin D status of the infant.....	57
Fig.9 : Standard curve for 1,25(OH) ₂ D	96
Fig.10 : Mean and standard deviation of serum alka- line phosphatase of control and rachitic patients before therapy and at every follow up	122
Fig.11 : Mean and standard deviation of serum phos- phorus of control and rachitic patients before therapy and at every follow up.....	123
Fig.12 : Mean and standard deviation of serum cal- cium of control and rachitic patients before therapy and at every follow up	124

	Page
Fig. 13 : Mean and standard deviation of serum 1,25 (OH) ₂ D of control group and rachitic patients before therapy and at every follow up	125
Fig. 14 : Mean serum calcium, phosphorus, alkaline phosphatase and 1,25(OH) ₂ D values of rachitic patients before therapy and at every follow up	126
Fig. 15 : Mean and standard deviation of alkaline phosphatase of control and patients with active, healing and healed rickets.....	127
Fig. 16 : Mean serum calcium and phosphorus of control group and patients with active, healing and healed rickets.....	128
Fig. 17 : Mean and standard deviation of serum 1,25 (OH) ₂ D of control and patients with active healing and healed rickets.....	129
Fig. 18 : Relationship between serum phosphorus and serum 1,25(OH) ₂ D concentrations of the control group.....	130
Fig. 19 : Relationship between serum alkaline phosphatase and serum 1,25(OH) ₂ D concentration of the rachitic patients before therapy...	131

LIST OF TABLES

	Page
Table 1 : Mean height velocity (cm/year) and mean 1,25-(OH) ₂ D at different ages.....	44
Table 2 : Types of rickets.....	55
Table 3 : Collective data of the control group...	114
Table 4 : Collective data of patients with nutritional rickets before therapy (group IIa), and at every follow up (group IIb - IIc).....	115
Table 5 : Comparison of the mean values of alkaline phosphatase, phosphorus, calcium and 1,25(OH) ₂ D of rachitic patients before treatment and at every follow up visit with the values of the control group	116
Table 6 : Comparison of the mean values of alkaline phosphatase, phosphorus, calcium and 1,25 (OH) ₂ D of rachitic patients before treatment, with the values of patients at each follow up.....	117
Table 7 : Comparison of the mean values of alkaline phosphatase, phosphorus, calcium and 1,25 (OH) ₂ D of rachitic patients with tetany, rachitic patients without tetany and the control group.....	118

Table 8 :	Mean values of alkaline phosphatase, phosphorus, calcium and $1,25(\text{OH})_2\text{D}$ of patients with active rickets, patients with healing rickets and patients with healed rickets in comparison with the mean values of control group.....	119
Table 9 :	Comparison of the mean values of alkaline phosphatase, phosphorus, calcium and $1,25(\text{OH})_2\text{D}$ of patients with active healing and healed rickets.....	120
Table 10:	Percentage of patients with roentgenographic evidence of active, healing, or healed rickets after every vitamin D injection.....	121

INTRODUCTION AND AIM OF THE WORK

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Rickets is still a prevalent disease in Egypt. It is reported to affect as many as 12-13% of Egyptian infants (Awwaad et al., 1975). The rickets seen in Tropical and North African countries in which children, seemingly, receive enough sunlight, is difficult to explain. (Srikantia, 1984).

Vitamin D plays a major role in regulating calcium and phosphorus homeostasis and in controlling the mineralization of bones and teeth (Forfar and Arneil, 1984).

It is now established that vitamin D is a prohormone, that is ultimately converted to a hormone, 1,25 dihydroxy-vitamin D (Martin et al., 1983). This hormone is 10 times more active than vitamin D itself and exerts its effects on many organs and tissues of the body (Deluca and Schnoes, 1985).

Extensive work has been and is being done to study the level of $1,25(\text{OH})_2\text{D}$ in normal persons as well as in many disease states including osteomalacia and different types of rickets. However, studies concerning the level of $1,25(\text{OH})_2\text{D}$ in nutritional rickets are few and most of them dealt with very limited number of cases.

It was observed that rachitic Egyptian infants require, and can tolerate very well, repeated large doses of vitamin D to achieve healing of their rachitic process (Khalifa et al., 1971 and El-Sallab et al., 1985).

We have noticed that a good number of patients could not achieve complete healing after receiving the usual course of vitamin D therapy which consists of three doses of 600,000 units of vitamin D.

Hence this work is conducted with the aim of studying the serum level of $1,25(\text{OH})_2\text{D}$ in rachitic Egyptian infants as a reflection of their vitamin D metabolism and its relation to the levels of serum calcium, phosphorus and alkaline phosphatase as well as to the roentgenographic changes. Also this work is conducted to study the changes in the concentration of $1,25(\text{OH})_2\text{D}$ induced by treatment, aiming at evaluating the appropriateness of our therapeutic regimen.

REVIEW OF LITERATURE

VITAMIN D

Vitamin D is a prohormone of a sterol type (Martin et al., 1983). It exists mainly in two forms, vitamin D₂ or ergocalciferol and vitamin D₃ or cholecalciferol (Herman, 1981). The D vitamins, D₂ and D₃, are generated from the provitamins, ergosterol and 7-dehydrocholesterol, respectively, by ultraviolet irradiation (Meyers et al., 1980). Ergosterol and 7-dehydrocholesterol differ chemically only in the side chain at position 21. This difference for humans is apparently of no physiologic consequence (Bikle, 1987).

Sources of Vitamin D:

Vitamin D can be obtained from dietary sources or through endogenous synthesis in the skin (Haddad, 1979).

Dietary sources of vitamin D are few e.g. egg yolk, fatty fish, fish liver oil and milk fat. Cereals, vegetables and fruits contain negligible amounts (Fraser, 1983). However, milk, dairy products and infant formulas, are frequently fortified with vitamin D (Papapoulos et al., 1979).