A STUDY OF 1,25 DIHYDROXYCHOLECALCIFEROL IN RACHITIC EGYPTIAN INFANTS

THESIS

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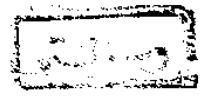

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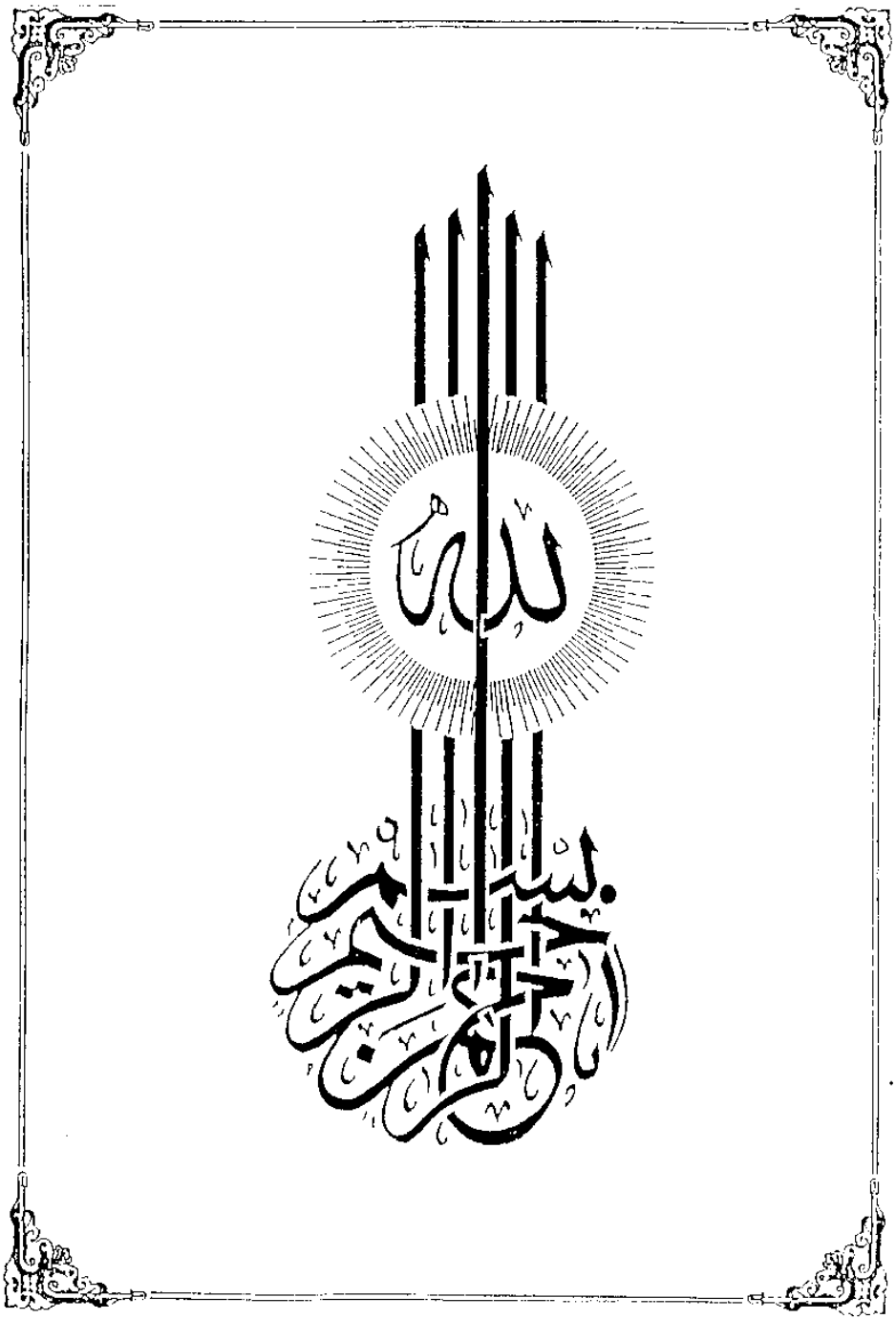

C O N T E N T S

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ABBREVIATIONS

25 OHD	25 hydroxyvitamin D
$1,25(OH)_2D$	1,25 dihydroxyvitamin D
$24,25(OH)_2D$	24,25 dihydroxyvitamin D
$25,26(OH)_2D$	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 OHDHT	25 hydroxydihydrotachysterol.

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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, recieve 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, 1983).

Extensive work has been and is being done to study the level of $1,25(OH)_2D$ in normal persons as well as in many disease states including osteomalacia and different types of rickets. However, studies concerning the level of $1,25(OH)_2D$ 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 recieving 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 $1,25(OH)_2D$ 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 roentogenographic changes. Also this work is conducted to study the changes in the concentration of $1,25(OH)_2D$ 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 D_2 or ergocalciferol and vitamin D_3 or cholecalciferol (Herman, 1981). The D vitamins, D_2 and D_3, 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).