Assessment of Vitamin D Status in Egyption Boys Aged 2-10 Years

Thesis

Submitted for Partial Fulfillment at Master Degree in ***Endocrinology & Metabolism***

By

Heba Fahd Abd El Shakour
M.B.B.Ch

Supervised by

Prof. Dr. Raef Malak Botros
Professor of Internal Medicine
Faculty of Medicine, Ain Shams University

Dr. Nancy Samir El Barbary
Professor of Pediatrics
Faculty of Medicine, Ain Shams University

Dr. Ahmed Mohamed Bahaa El-Din
Lecturer of Internal Medicine
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
2018

سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to **ALLAH,** *the Most Kind and Most Merciful.*

I'd like to express my respectful thanks and profound gratitude to **Prof. Dr. Raef Malak Botros,** *Professor of Internal Medicine Faculty of Medicine, Ain Shams University for his keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

I am also delighted to express my deepest gratitude and thanks to **Dr. Nancy Samir El Barbary,** *Professor of Pediatrics Faculty of Medicine, Ain Shams University, for her kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

I am deeply thankful to **Dr. Ahmed Mohamed Bahaa El-Din,** *Lecturer of Internal Medicine Faculty of Medicine, Ain Shams University, for her great help, active participation and guidance.*

Heba Fahd Abd El Shakour

List of Contents

List of Tables

Table No.	Title	Page No.

List of Tables Cont...

List of Figures

List of Figures Cont...

List of Figures Cont...

List of Abbreviations

Abb.	Full term
AITDs	Autoimmune thyroid diseases
AMPs	Antimicrobial peptides
aPL	Against cell membrane phospholipids
APS	Anti-phospholipid syndrome
BCG	Bromocresol green
Ca	Calcium
COPD	Chronic obstructive pulmonary disease
CT	Calcitonin
CVD	Cardiovascular disease
DEXA	Dual energy X-ray absorptiometry
DNA	Deoxribonuclic-acid
DRIP	Vitamin D receptor interacting protein complex
ECLAM	European Consensus Lupus Activity Measurement
EDTA	Ethylenediaminetetraacetic acid
ELISA	Enzyme-Linked Immunosorbent Assay
FEV1	forced expiratory volume in 1
HT	Hashimoto's thyroiditis
IBD	Inflammatory bowel disease
IL-6	Interleukin-6
INF-γ	Interferon
IU	International unit
MCTD	Mixed connective tissue disease
MS	Multiple sclerosis
MT	Mycobacterium tuberculosis
NAFLD	Non-alcoholic fatty liver disease
OCPC	Ortho-cresolphthalein complexone
PTH	Parathyroid hormone
RA	Ruhmatiod arthritis
RCTs	Randomized controlled trials
RDA	Recommended dietary allowances
RNP	Anti- ribonucleo protein

List of Abbreviations Cont...

Abb.	Full term
SLE	Systemic lupus erythrmatosis
SPSS	Statistical package for Social Science
SS	Sjogren's syndrome
SSc	Systemic sclerosis
TGF-βl	Transforming growth factor-βl
TIDDM	Type1diabtis mellitus
TNF-α	Tumor necrosis factor alpha
TNF-α	Tumor necrosis factor- α
UCTD	Undifferentiated connective tissue disease
ULs	Upper Intake Levels
UVB	Ultraviolet B
VDBP	Vitamin D-binding protein
VDREs	Vitamin D response elements

INTRODUCTION

Vitamin D is a potent steroid hormone that have important physiological actions. Apart from its role in mineral homeostasis it has many extra-skeletal actions, as most of tissues and cells in the body have vitamin D receptors. Several of these cells posess the enzymatic machinery to convert the primary circulating form of vitamin D, 25 – hydoxy vitamin D, to the active form:1,25 – dihydroxy vitamin D ***(Holick, 2007).***

As regards skeletal health, vitamin D is essential in regulation of calcium homeostasis and bone metabolism. On the other hand, vitamin D plays an important role to decrease risk of many chornic illnesses. These include cancers e.g colorected cancer ***(Joan et al., 2007)***, autoimmure diseases e.g., Rheumatoid arthritis ***(Munger et al., 2006)*** infections diseases, cardiovascular diseases ***(Wang et al., 2008)***, schizophrenia and Alzheimer diseases.

Humans get vitamin D mainly from exposure of the skin to solar ultra violet B radiation (uVB; 290-315 nm) and from dietary intake. The solar ultravidolet radiation penetrates the skin and converts 7 – dehydorxy cholesterol to pre-vitamin D3 ***(Holick, 2007)***.

Vitamin D deficiency is common because of lack of appreciation that sun exposure is the major source of vitamin D for most humans. In countries of the Middle East the common

use of concealing clothing where the skin is shielded from the sun reduces the skin's ability to synthesize vitamin D in response to sunlight exposure.

Vitamin D deficiency causes Rickets in children and Osteomalacia in Adults. It also precipitates and exacerbates osteopenia, osteoporosis and fractures in adult ***(Holick, 2008)***.

A circulating level of 25-hydroxyvitamin D of >30 ng/ml is required to maximize vitamin D beneficial effects for health. In the absence of adequate sun exposure, at least 800-1000 IU vitamin D_3 / day needed to achieve this in children and adults ***(Holick, 2007).***

Some people are more at risk of vitamin D deficiency and so are recommended to take vitamin supplements routinely, these include all pregnant and breast feeding women, all infants and young children aged 6 month to 5 years, people aged 65 years and over and people who are not exposed to much sun ***(Holick, 2006)***. Adoctor may also recommended routine supplements for certain people with darker skin and for people with certain gut, liver, or kidney diseases ***(Ravithadhani et al., 2012)***.

Vitamin D deficiency is a worldwide health problem, spanning many countries and including all ages ***(Hossein-Nezhad and Holick, 2013).***

High prevelance of vitamin D insufficiency in healthy children and adolescent has been reported worldwide in the past few years. Studies in India found that hypovitaminosis D was seen in 95% of apparently healthy adolescents. Other studies reported prevelance of vitamin D deficiency as 59.4% in Turkey, 78% in France, 42.5% in Beijing, 47% in Greece ***(Rajakumar et al., 2005)***.

In recent studies about the prevelance of vitamin D deficiency in Egypt reveal that: the rate of hypovitaminosis in adult between (20-60) years is 77% ***(Marawan, 2013)***, infertile females between (20-50)years is 80% in Cairo ***(Matar, 2011)*** and 70% in port-Foud ***(ElDawoody, 2011)***, and in old age between (60-70)years the rate is more than 50**% *(Salem, 2011)*** and 90% in those over 75 years ***(Salem, 2011).***

Aim of the Work

We aim to determine the status of vitamin D deficiency/sufficiency in a sample of Egyption male children in the age period 2-10 years living in greater Cairo region.