## EVALUATION OF BONE METABOLISM IN RICKETS A NEW APPROACH

#### Thesis

Submitted for partial fulfillment of master degree in pediatrics

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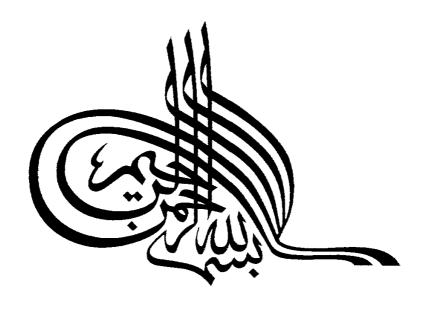
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## Dedication

Dedicated to

My mother

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My husband





#### 🖁 Acknowledgment 🖁

#### First and foremost thanks are to GOD

I wish to express my deep appreciation to **prof. Dr.** Sanaa Youssef Shaaban, Professor of Pediatrics, Ain Shams University, for giving me the privilege of working under her instructive and helpful guidance.

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#### \$ List of abbreviations \$

ALP : Alkaline phosphatase.

: Bone Gla protein. **BGP**  ${}^{0}C$ : Degree centigrade.

: Total calcium. Car

Cap. : Capsule.

: Vitamin D binding protein. **DBP**  $1,25(OH)_2D_3$ : 1,25 dihydroxy vitamin  $D_3$ **24,25(OH)**<sub>2</sub>**D**<sub>3</sub>: 24,25 dihydroxy vitamin D<sub>3</sub>. **25,26(OH)**<sub>2</sub>**D**<sub>3</sub> : 25,26 dihydroxy vitamin  $D_3$ 

: Enzyme linked immunosorbent assav. **ELISA** 

: Figure. Fig. : gram. g.

HPLC : High performance liquid chromatography.

: Hour. hr.

: Highly significant. H.S. : 25 hydroxy vitamin D<sub>3</sub>. 25 (OH) D<sub>3</sub>

: Type I collagen carboxy terminal telopeptide. **ICTP** 

: International unit / Liter. IU/L : International unit /milliliter. IU/ml : International unit / tablets. IU/tab

mcg/cap : Microgram / capsule.

: Magnesium. . Mg

: Milligram per kilogram. mg/kg Matrix Gla protein MGP

: Minute. Min.

∠ mm³ : Cubic millimeter. ng/ml : nanogram / milliliter.

OB : Osteoblast : Osteoclast  $\mathbf{OC}$ % : Percent.

Pi Inorganic phosphorus. PICP : Procollagen carboxy-terminal propeptide of type I

collagen.

PTH: Parathyroid hormone.
RIA: Radioimmunoassay.

S. : Significant.

**S.D.** : Standard deviation.

**TSH**: Thyroid stimulating hormone.

**VDR**: Vitamin D receptor.

Wt. : Weight.

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<sup>&</sup>quot;Evaluation of bone metabolism in rickets" a new approach

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#### § Abstract Z

Type I collagen is synthesized by osteoblasts and accounts for about 90% of the organic matrix of bone. We have used a new specific immunoassay for the measurement of carboxy-terminal propeptide of type I procollagen (PICP) and cross linked carboxy-terminal telopeptide of type I collagen (ICTP) which allow assessment of formation and degradation of type I collagen respectively. Thirty one patients having active rickets were investigated for their serum calcium, phosphorus, alkaline phosphatase, PICP and ICTP.

The whole group of patients showed a highly significant decrease in their total calcium and phosphorus levels (P <0.001). A highly statistical significant increase in their serum alkaline phosphatase, PICP and ICTP levels (P < 0.001) in comparison to the control group which included ten patients. A positive correlation was also found between alkaline phosphatase and both PICP and ICTP. We concluded that PICP and ICTP are specific biochemical markers of bone formation and bone degradation respectively. They are of great value to identify patients with increase bone turnover as in rachitic patients.

Introduction and
Aim of the work