VALUE OF SERUM OSTEOCALCIN LEVEL IN OSTEOPOROSIS

Thesis
Submitted in Partial Fulfilment of the
Requirements of M.D. Degree
in Physical Medicine

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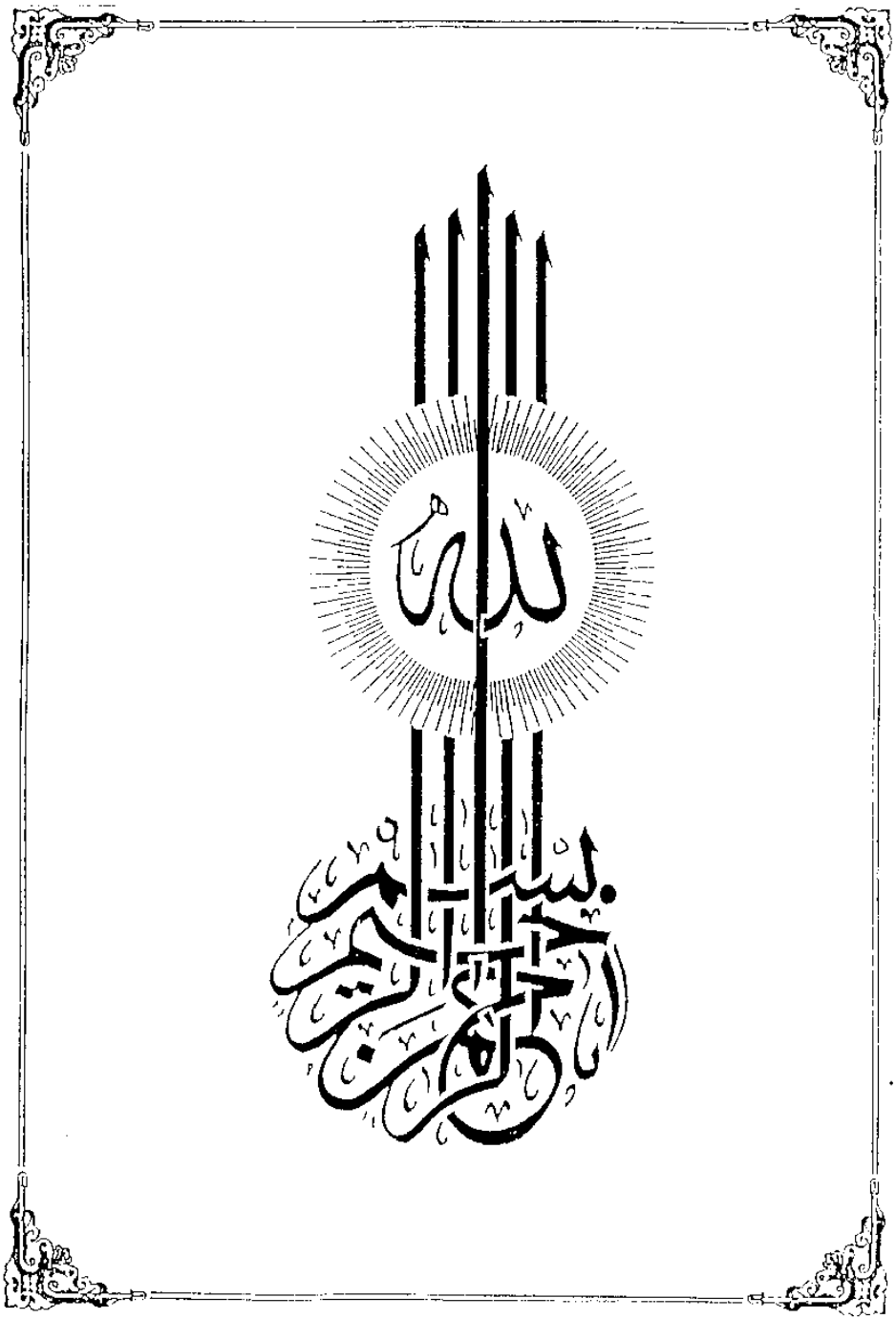
1995



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الكليـــة:

رســالـــة ماجســـتير / دكتـــوراه

اسم الطالب: نادية حامد الحروسي .....

عنوان الرسالة: Value of serum osteocalcin level in osteoporosis
قيمة مستوى الأوستيوكالسين بالمصل في حالات تخلخل العظام

اسم الدرجـــة : (ماجستيـــر / دكتـــوراه)

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تاريخ البحـــث : / / ١٩٩٥

الدراســـات العليـــا

تختـــم الإجـــازة : / / ١٩٩

أجيزت الرسالـــة بتـــاريخ / /

موافقة مجلس الكلية / / ١٩٩

موافقة مجلس الجامعة / / ١٩٩

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الدرجة العلمية : ...
القسم التابع له : ...
اسم الكلية : ...
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أ.م.د. عرفـــه عمر

ثم الأشخـــاص الذيـــن تعـــاونوا معـــى فـــى البحـــث

وهـــم :

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وكـــذلك الهيئـــات الآتيـــة :

١) قسم الطب الشرعى جامعة عين شمس

٢) قسم الكيمياء الحيوية جامعة عين شمس

٣) قسم الباثولوجيا الاكلينيكية جامعة عين شمس

ACKNOWLEDGEMENT

I wish to express my deepest gratitude and thanks to Prof. Dr. **Nadia Abd El-Salam**, *Head of Physical Medicine Department, for her kind supervision, constructive encouragement and guidance.*

I would like to express my sincere gratitude and thanks to Prof. Dr. **Mahmoud El-Tayeb Nasser**, *Professor of Physical Medicine, for his valuable supervision and faithful review of this work.*

I would also like to express my gratitude and appreciation to Dr. **Nora Haroun**, *Assistant Professor of Physical Medicine for her kind supervision and precious help.*

My sincere gratitude should be expressed to Dr. **Hanaa El-Tayeb**, *Assistant Professor of Biochemistry, for her expert supervision and generous support.*

I am grateful to Dr. **Omar Hussein**, *Assistant Professor of Diagnostic Radiology, for his valuable supervision. His helpful guidance was attending every part of this thesis.*

LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
BGP	Bone gamma-carboxyglutamic acid containing protein
BMD	Bone mineral density
CT	Computed tomography
DPA	Dual photon absorptiometry
ESR	Erythrocyte sedimentation rate
GFR	Glomerular filteration rate
GLA	Gamma-carboxyglutamic acid
RD	Radiographic photodensitometry
RDA	Recommended Dietary Allowance
RG	Radiogrammetry
RIA	Radioimmunoassay
SGoT	Serum glutamyl oxaloacetic transaminase
SGpT	Serum glutamyl pyruvic transaminase
SPA	Single photon absorptiometry
TBC-NAA	Total body calcium by neutron activation analysis

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INTRODUCTION

Osteoporosis is defined as decreased bone mass greater than expected for a given age, race and sex, associated with parallel loss of bone mineral and matrix. This process is a matter of uncoupling that occurs between catabolism and anabolism which usually go hand in hand with aging. It is the most common cause of osteopenia and the most common metabolic disease **(Aloia et al., 1985)**.

Osteoporosis is a significant public health problem which is not studies in Egyptian people up till now.

Physicians dealing with postmenopausal patients are frequently confronted with vertebral, wrist or hip fractures. The economic burden of age-related fractures is truly enormous because of the large number of people involved and the expensive and protracted care that is often required **(Riggs and Melton, 1986)**.

There are two types of generalized osteoporosis:

- Type I: affects primarily trabecular bone and is related to estrogen deficiency.
- Type II: affects both trabecular and cortical bone and is age-related.

Postmenopausal osteoporosis is the most common type of osteoporosis. Loss of cortical bone is accompanied by an even greater loss of the honey comb of trabecular bone.

As trabecular bone has a much greater surface area than cortical bone, it is more metabolically active. Thus when bone is lost, trabecular bone is lost more quickly than cortical bone **(Stevenson, 1987)**.

At least thirty percent of bone mineral has to be lost before changes are seen on classical bone radiographs **(Matkovic et al., 1990)**. Newer radiological techniques have generally been employed to determine the degree of bone loss such as single and dual photon absorptiometry, dual-energy x-ray absorptiometry and quantitative computed tomography. However, they are costly and not always available.

The conventional clinical indices of bone metabolism involve the measurement of serum alkaline phosphatase and urinary hydroxyproline excretion. However, serum alkaline phosphatase is derived from several sources other than bone, and urinary hydroxyproline reflects the turnover of extraskeletal as well as skeletal proteins **(Krane and Potts, 1972)**.

The vitamin k-dependent protein osteocalcin which is synthesized in bone cells and is also found in human body, may provide a more specific chemical index of bone turnover **(Slovik et al., 1984)**.

Osteocalcin is a 49-residue protein that contains residues of the vitamin K-dependent amino-acid gamma-carboxy glutamic acid and hence called bone GLA protein (BGP). It was discovered by **Hauschka et al. (1975)** in chicken bone and by **Price et al. (1976)** in bovine bone.

As osteocalcin is elaborated exclusively by osteoblasts, the circulating level of this bone specific protein may reflect the level of osteoblastic activity and may provide a more specific chemical index of bone turnover **(Reid et al., 1986)**.

AIM OF THE WORK

1) To study the correlation between bone mineral density measurements and osteocalcin level in order to assess the validity of the latter as a diagnostic and follow up test for evaluation of therapy in osteoporosis.
2) To assess the effect of different lines of treatment (medical, physical and combined therapy) used in treatment of osteoporosis on osteocalcin level.

REVIEW OF LITERATURE