بسم الله الرحمن الرحيم

∞∞∞

تم رفع هذه الرسالة بواسطة / سلوي محمود عقل

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

A STUDY OF OSTEOPOROSIS IN PREMENOPAUSAL WOMEN IN URBAN AND RURAL AREAS

Submitted By

Heba Mohamed Ali Abdelsalam

M.B.B.Ch., Faculty of Medicine, Ain Shams University, 1991

Master of (Obstetrics & Gynecology), Faculty of Medicine, Ain Shams University, 1999

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences

Department of Environmental Medical Sciences
faculty of Graduate Studies and Environmental Research
Ain Shams University

2022

APPROVAL SHEET

A STUDY OF OSTEOPOROSIS IN PREMENOPAUSAL WOMEN IN URBAN AND RURAL AREAS

Submitted By

Heba Mohamed Ali Abdelsalam

M.B.B.Ch., Faculty of Medicine, Ain Shams University, 1991

Master of (Obstetrics & Gynecology), Faculty of Medicine, Ain Shams University, 1999

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences
Department of Environmental Medical Sciences

This thesis was discussed and approved by:

The Committee Signature

1-Prof. Dr. Mostafa Hassan Ragab

Prof. of Community Medicine and Environment,
Head of Department of Environmental Medical Sciences
Faculty of Graduate Studies and Environmental Research
Ain Shams University

2-Prof. Dr. Hala Ibrahim Awad Allah

Prof. of Community Medicine and Environment Department of Environmental Medical Sciences,
Vice Dean of Faculty of Graduate Studies and Environmental Research for Community & Environment Affairs
Ain Shams University

3-Prof. Dr. Amr Mohamed Abd-Elhady

Prof. of Orthopedic Surgery
Faculty of Medicine
Ain Shams University

4-Prof. Dr. Yasser Ali Al Batrawy

Prof. of Orthopedic Surgery
Faculty of Medicine
Al Azhar University

2022

A STUDY OF OSTEOPOROSIS IN PREMENOPAUSAL WOMEN IN URBAN AND RURAL AREAS

Submitted By

Heba Mohamed Ali Abdelsalam

M.B.B.Ch., Faculty of Medicine, Ain Shams University, 1991
Master of (Obstetrics & Gynecology), Faculty of Medicine, Ain Shams University, 1999

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences
Department of Environmental Medical Sciences

Under The Supervision of:

1-Prof. Dr. Hala Ibrahim Awad Allah
Prof. of Community Medicine and Environment , Department of Environmental Medical Sciences
Faculty of Graduate Studies and Environmental Research
Ain Shams University

2-Prof. Dr. Amr Mohamed Abd-Elhady
Prof. of Orthopedic Surgery
Faculty of Medicine
Ain Shams University

3-Dr. Mortada El-Sayed Ahmed
Lecturer of Obstetrics & Gynecology
Faculty of Medicine
Ain Shams University

4-Dr. Azza Omar Lofty Saleh
Associate Prof. of Environmental Medical Sciences
National Nutrition Institute

2022

ACKNOWLEDGEMENT

I'd like to express my respectful thanks and profound gratitude to
***Dr. Hala Ibrahim Awadallah,** Professor of Community and Environmental Medicine for her kind care, continuous supervision, valuable instructions, constant help and continuous encouragement, which made possible the completion of this work.*
I would also like to extend my deepest gratitude and thanks to
***Dr. Amr Mohamed Abd-Elhady,** Professor of Orthopedic surgery, for his keen guidance, kind supervision,*
Additionally, I am really grateful to
***Dr. Mortda El-Sayed Ahmed,** Professor Associate of Obstetrics& Gynecology, for his valuable advice*
Then, I am delighted to show my sincere gratitude and thanks to
***Dr. Azza Omar Lotfy Saleh,** Consultant of Environmental Medical Science for her great assistance throughout this work*
Last but not the least, I would like to deeply thank
***Dr. Hoda A.abed ELSalam,** Fellow of nutrition and food science for her valuable assistance*

ABSTRACT

Background: Osteoporosis is a systemic skeletal disease characterized by low bone mass with a consequent increase in bone fragility and susceptibility to fracture. With current trends of increase in life expectancy and increasing number of elderly women, it is a global public health issue. Moreover, this problem is expected to reach epidemic proportions by 2050.

Aim: The current study investigates the effect of environmental factors on the development of osteoporosis among urban and rural premenopausal women and its relationship with the dietary habits.

Subjects and methods: This is a cross sectional study that included 400 premenopausal women with regular menses and mean age 38.85±3.11 years where half of them were from urban areas and other half were from rural areas. The studied women were recruited from National Nutrition Institute with the exclusion of those with high risk factors for secondary osteoporosis. All participants underwent medical history taking with focus on reproductive history, drug history, family history of osteoporosis, sun exposure, physical activity, coffee consumption, cigarette smoking, vitamin D intake and history of fractures. In addition, they were all subjected to full examination with anthropometric measures, dietary assessment using 24 hours recall and bone density assessment using Dual-Energy X-ray Absorptiometry (DEXA) scan.

Results: There were significant higher values in the urban sample than that of the rural sample in nutrient analysis of 24-hour recall for the following parameters: Kcal, protein, CHO, total lipid, K, P, Zn,

Cu, Ca, Mg, Fe, vitamin C, A, B1and B2. However, there was a highly statistically significant difference between rural and urban areas as regard the cause of a previous fracture, the duration of sun exposure and vitamin D intake. Osteoporosis was diagnosed in 4.5% of the studied women and 27.75% had osteopenia.

Conclusion: The prevalence of osteoporosis in the studied group was 4.5% (n=18). Among them (55.6%) were from rural areas and (44.4%) from urban areas. Nutrient profile was nearly similar in osteoporotic and non-osteoporotic women. The study revealed that obesity protect from osteoporosis.

Recommendations: future research about osteoporosis among lean women is recommended.

Keywords: Osteoporosis, premenopausal women, DEXA, urban and rural areas.

List Of Contents

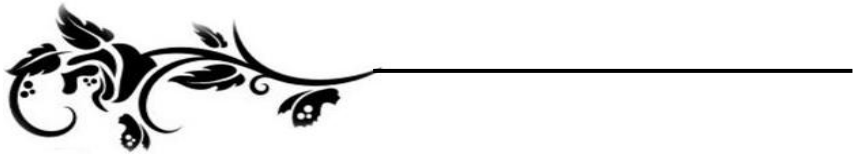
List of Tables

Table	Page

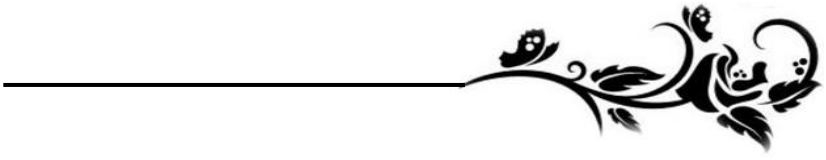
List of Figures

List of Abbreviations

AOD	Alcohol and Other Drugs
BMD	Bone Mineral Density
BMI	Body Mass Index
BTM	Bone Turnover Markers
COC	Combined Oral Contraceptives
CT	Computerized Tomography
DEXA	Dual-Energy X-ray Absorptiometry
DMPA	Depot Medroxyprogesterone Acetate
EMR	Eastern Mediterranean Region
FAO	Food and Agriculture Organization
FDA	Food and Drug Administration
FRAX	Fracture Risk Assessment Tool
HRT	Hormone Replacement Therapy
IOP	Idiopathic Osteoporosis
LS	Lumber Spine
OSTA	Osteoporosis Self Assessment Tool
PBM	Peak Bone Mass
PTH	Parathyroid Hormone
QCT	Quantitative Computed Tomography
QUS	Quantitative Ultrasound
RDA	Recommended Dietary Allowances
SERM	Selective Estrogen Receptor Modulators
SSRI	Selective Serotonin Reuptake Inhibitors
USPSTF	U.S. Preventive Services Task Force
CTX	C-Terminal Telopeptide
CaSR	Calcium Sensing Receptor
NOF	National Osteoporosis Foundation



INTRODUCTION



Introduction

Osteoporosis is an important, global public health issue, which is especially relevant with an increasing life expectancy and increasing number of elderly women worldwide, and which is expected to reach epidemic proportions by 2050 **(Sözen et al., 2017).**

Osteoporosis is a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture. This well-established definition, developed by international consensus, comprises both adverse effects of osteoporosis on bone mass and microstructure, and the clinical outcome of fracture **(Mäkitie and Zillikens, 2021).**

The natural consequence of osteoporosis is fractures and their complications, most common among them being fracture of the vertebrae (spine), proximal femur (hip) and distal forearm (wrist). Hip fractures are associated with an 8.4–36% excess mortality within 1 year **(Pai, 2017).**

Vitamin D deficiency is a global public health issue. About one billion people worldwide have vitamin D deficiency, while 50% of the population has vitamin D insufficiency Vitamin D deficiency and insufficiency are highly prevalent, as is shown by the fact that more than half of the population worldwide has levels lower than 30 ng/ml **(Sizar et al., 2021).**

Vitamin D deficiency in Egypt has reached epidemic proportions. Females are the most affected members of society.

Introduction

Urbanization and social factors are thought to cause that phenomenon **(Botros et al., 2019).** It was reported that 77% of healthy Egyptian adults aged 20-60 years had 25 (OH) D level < 20 ng/ml and 20% had level of 25(OH)D between 20-29 ng/ml **(Boutros et al., 2016).** Moreover, the prevalence of vitamin D deficiency was 78.9 % Egyptian adolescent aged 10-19 **(Hendawy et al., 2020).**

World Health Organization defined osteoporosis as a decreased bone mineral density (BMD) 2.5 standard deviations or more below mean peak BMD of young adults (a T-score of <-2.5 SD) when measured by Dual-Energy X-ray Absorptiometry (DEXA) **(World Health Organization, 2013).** The diagnostic criteria recognized the importance of low BMD in the pathogenesis of fragility fractures and provided a tool that could be used in epidemiological studies to quantify the prevalence of osteoporosis. However, the utility of BMD as a clinical indicator of osteoporosis is limited, because BMD is only one of a number of important risk factors for fracture, and the majority of fragility fractures occur in individuals with BMD values above this threshold **(Compston et al., 2019).**

Osteoporosis is a hidden disease which symptoms typically do not appear until the occurrence of a broken bone and even minor stress may induce fractures when BMD is decreased **(Chen, Li & Hu, 2016).** Risk of osteoporosis and its associated complications is one of the important health problems in the world. The EMR countries are experiencing processed food diet, and a change in lifestyle (e.g., sedentary life, office working), contributing to an