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Osteoporosis In Palestinian Women: Evaluation Of Risk Factors

Iman Ahmad Mohamad Al-Shaweesh.

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By

Iman Ahmad Mohamad Al-Shaweesh

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Osteoporosis In Palestinian Women: Evaluation Of Risk Factors

Student Name: Iman Ahmad Al-Shaweesh.

Registration No: 20010783.

Supervisor: Prof. Mahmoud Abu-hadid.

Co-Supervisor: Dr. Abed Al-Hakeem Aideh.

This thesis was successfully defended and approved on: July 2, 2003

Committee Members	**Signature**
1-Prof. Mahmoud Abu-hadid	M. Abu-hadid
2-Dr. Elias Saba	
3-Dr. Rostom Al namary	

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Declaration

I Certify that this thesis submitted for the degree of master is the result of my own research, except where otherwise acknowledge, and that this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Dedicated....
To my beloved family,
To my beloved friends,
To my beloved A.V.H. with all Faculty.
To my university.
To all Palestinian Women.

Signed: Iman Ahmad Al-Shaweesh.

Date: 4/6/2003.

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ABSRTACT

Osteoporosis is an insidious disease. It is asymptomatic disease till the subject gets bone fracture such as hip fracture, vertebral (lumber spine) fracture and med-raduis fracture with minor trauma. It is a worldwide health problem, for women in particular, and its risk factors, protective factors and early diagnosis have been well documented in many populations worldwide. However the Palestinian population in general and the high risk group Palestinian women has not been studied. The confirming diagnosis to this disease is a retrospective one based on the occurrence of the fractures mentioned above in the patient with no or little trauma. Our study will be the first detailed study of osteoporosis in Palestinian women based on 338-subject of Palestinian women at various ages. The sample contains osteoporotic, osteopenia and normal subjects. We will compare osteoporotic women to their age matched normal controls. In this study we want to address the question does osteoporosis in Palestinian women follow the same worldwide pattern with regard to prevalence, risk factors and protective factors as the worldwide one or not? After analysis and based on WHO definition of osteoporosis we found that 81 women have osteoporosis, 137 women have osteopenia and 130 women are normal. Furthermore comparing the osteoporotic and normal groups together using SPSS chi-square test analysis we confirm that the following universal factors affect the progress of osteoporosis in Palestinian women. These significant factors in our study include aging, menopause, life style (low consumption of milk or its product, poor sport activities and high caffeine intake), loss of weight, body weight, early menopause, risky disease as rheumatic disease, and steroid therapy. Based on these result prevention must be focused on risky groups, and on bone densitometry DXA for early prevention of this silent disease.

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ABREVIATION

BC	Before Christ.
BMD	Bone Mineral Density.
BMC	Body Mineral Content.
BMI	Body Mass Index.
CM	Centimeter.
DXA	Duel-Energy X-Ray.
HRT	Hormonal Replacement Therapy.
HT	Height
IOF	International Osteoporosis Foundation.
IM	Intramuscularly.
N/S	Nasal Spray.
NORA	National Osteoporosis Risk Assessment.
NOF	National Osteoporosis Foundation.
POPS	Palestinian Osteoporosis Prevention Society.
QC	Quality Control.
QUS	Quantitative Ultrasound.
QCT	Quantitative Computed Topography.
SD	Standard Deviation.
S/C	Subcutaneous.
WHO	World Health Organization.

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DEFFINITIONS

Body Mass Index (BMI): anthropometrical measure of body mass. Weight in kilograms divided by height in meter square. (m^2).

Coefficient of Variation: Is the standard deviation expressed as a percentage of the mean.

Cortical Bone: Compact dense bone that makes up eighty percent of skeletal mass.

DXA: Dual energy X-ray absorptiometry. Bone density systems that use two X-ray energies to measure bone density, with a low patient exposure and a fast scan time.

Estrogen: A steroid hormone produced primarily by the ovaries but also by the adrenal cortex. It is responsible for the development of secondary sex characteristics and the cyclic nature of reproductive physiology.

Gravida: Is the number of pregnancies by one female.

Hormonal Replacement Therapy: Therapy of estrogen alone (ERT) or a combination of estrogen and progesterone (HRT) used to treat changes associated with menopause, such as hot flushes.

Morbidity: A measure of disease to a defined population.

Menopause: It is a term derived from two Greek words (Meno) meaning month and (pause) meaning terminate. Cessation of the menses by women at age of >45, called change of life.

Osteopenia: Condition in which bone mass is low, bone mineral density 1-2.5 SDs below the mean value of peak bone mass in young adult women. (WHO, 1994)

Osteoporosis: Bone mineral density more than 2.5 SDs below the mean value of peak bone mass in young adult women.

Osteomalacia: Is a reduction in mineralization of the bones.

Progesterone: Is the hormone produced by the corpus luteum whose function is to prepare the endometrium for the reception and development of fertilized ovum.

Prevalence: a measure of morbidity based on current sickness/disease in a population.

Premenopause: Women having regular periods without experiencing changes in menstrual flow.

Postmenopause: Women having no periods for at least one year and only attributed to menopause.

Precision: Ability of an instrument to reproduce the same results in repeat measurements.

Perimenopause: Changes or irregularities in menstrual flow not attributed to other causes, during the last 12 months.?

Premature menopause: Early menopause before the age of 40 years. Also known as primary ovarian failure.

Primary health cares: First contact and continuing comprehensive health care, including basic or initial diagnosis and treatment, health supervision, management of chronic conditions and preventive health services.

Para: The term used to refer to past pregnancies that have produced an infant that has been viable whether the infant is alive at birth or not.

Parity: The condition of a woman with respect to her born children.

Programming: Term used to describe persisting changes in structure and function caused by environmental stimuli during critical period of early development.

Severe Osteoporosis: Bone mineral density more than 2.5 SDs below the mean value of peak bone mass in young adult women, and the presence of fractures.

T-Score: Indicates the amount of bone loss, by quantifying the difference between the patients Bone Mineral Density (BMD) at his/ her current age, and the peak bone mass achieved by young normal individuals.

Trabicular bone: Spongy bone, comprising twenty percent of the skeletal mass and very metabolically active.

World Health Organization (WHO): An international organization that deals with health issues, sets policies, and publishes reports.

OSTEOPOROSIS IN PALESTINIAN WOMEN EVALUATION RISK FACTORS

I- INTRODUCTION:

I-1 Historical Background:

Involution bone loss was recognized 150 years ago by sir Astely Cooper who observed its association with hip fracture. The term 'osteoporosis' however, was first used in medical circles in the 19th century by the German and the French physicians when describing the histological appearance of osteoporotic bone. (Cooper &Jordan, 2002). Osteoporosis was first documented in 3000 BC, the term has been used in the past loosely to include all states in which there is a reduction in the amount of calcified bone, regardless of whether or not it is association with fractures. In addition some clinicians incorrectly use the term osteoporosis synonymously with postmenopausal reduction in bone mass. It is important to clearly differentiated osteomalacia in which there is a reduction in mineralization of bone and osteoporosis. (Cummings et al, 1985).

I-2 Definition and Description:

"Osteo" means bone ,and "porosis" means thinning or becoming more porous, so osteoporosis literally means "thinning of bone".(Arthritis Society,2002). Osteoporosis has been defined by the consensus development conference as "a systemic skeletal disorder characterized by low bone mass and microarchitectuaral deterioration of bone tissue, with consequent increase in bone fragility and susceptibility to fracture."(Cooprer&etal, 2002). Clinically, osteoporosis is recognized by the occurrence of characteristic low trauma fractures. Furthermore any meaningful definition of osteoporosis must account for the risk of fracture. So using fracture, as a diagnostic criterion is advantageous since it is a direct event that can be easily formulated into a diagnostic algorithm. However the obvious disadvantage of this criterion is that diagnosis will be delayed in a disorder where prevention is an important end goal. As a result of this bone mineral density (BMD) has been used as non-invasive method for defining osteoporosis and for assessing bone mass in an

attempt to predict future fractures. Low BMD is one of the strongest independent risk factors for fracture (Cooper&etal, 2002).

Osteoporosis is easily confused with osteoarthritis, which is a form of arthritis that results in breakdown of the cartilage covering bone ends. However osteoporosis affects mainly the bones of the hip, wrist and particularly those in the mid-back. Thinning of the hip and the wrist bones as a result of osteoporoses make them prone to fracture with little truma, while the vertebrae thinning might cause them to collapse from relatively minor forces. (Arthritis Society, 2002). In 1994 WHO defined osteoporoses as "A disease characterized by low bone mass and microarchitectural deterioration of bone tissue, leading to enhanced bone fragility and a consequent increase in fracture risk."(1999, WHO).

I-3 Physiology of bone growth/ loses:

Bone strength is directly correlated with the bone mass that is reflected in the actual bone BMD. Furthermore the peak bone mass achieved during growth and maturation affects the BMD at any age. Also the speed and amount of individual bone loss is affected by his/her sex, age, menopause, health status, medication use and finally his/her life style. Recently National Osteoporosis foundation (NOF) in their study suggested that peak bone mineral density is reached by the third decade of life and is influenced by sex, race, heredity and possibly by physical activity and nutritional status of the child and young adult (NOF, 2002). Bone is a dynamic tissue that is constantly being remodelled. This bone remodelling consist of new bone formation and bone loss so that bone mass remains constant. With age, imbalance in this process favours bone loss that results in a net loss of bone.

Structurally, bones are of two types. The first type is the trabecular bone, which forms the inner meshwork of the vertebrae pelvis, flat bones and the ends of long bones. This bone type constitutes only 20% of the skeleton but it has a large surface area and is sensitive to metabolic changes. The second type is Cortical or compact bone, which makes up 80% of the skeleton, forms the outer casing of all bones and is the major constituent of the shaft of long bones. The women bone loss that occurs with age results in a 35% reduction of cortical bone and a 50% reduction