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Recent advances in management of osteoporosis

An essay submitted for partial fulfillment of master degree in orthopaedic surgery

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2000

ACKNOWLEDGMENT

First and foremost, thanks to ALLAH for giving me the patience and help to accomplish this work.

I would like to appreciate my deepest gratitude to Prof. Dr. Sameh Ahmed Shalaby, Professor of orthopaedic surgery Department, Faculty of medicine, Ain Shams University, for his great efforts and deals to produce this essay in acceptable manner.

Also, I would like to appreciate my deepest thanks to Prof. Dr. Hany Mamdouh Hefny, Ass. Professor of orthopaedic surgery Department, Faculty of medicine, Ain Shams University, for his continuous generous supervision and valuable advises during the production of this essay.

Lastly, I would like to thank heavily Dr. Osama Youssef Rabie, lecturer of orthopaedic surgery, Faculty of medicine, Ain Shams University, for his great encouragement, kind help and profuse guidance for the production of this essay.

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Chapter I

Introduction

Osteoporosis has been the subject of intensive research over the past 20 years. It is a pathological event, which is difficult to be accurately defined. A simple definition is that it is an abnormal reduction in bone tissue mass per unit volume of anatomical bone. Bone; as an active biological tissue; is in a state of equilibrium between bone formation and bone breakdown. In osteoporosis this equilibrium has been disturbed i.e. the rate of bone breakdown exceeds the rate of bone formation. The most currently accepted definition of osteoporosis is that it is a skeletal disorder characterized by low bone mass and microarchitectural deterioration of bone tissue with a consequent increase in bone fragility and susceptibility to fracture risk (Anon, 1993).

Osteoporosis as a major health and socioeconomic problem is associated with aging and menopause. The two major determinants of risk of osteoporosis are peak of bone mass (***reached in the third decade of life)*** and bone loss thereafter. There is substantial evidence that bone mass is of major importance for the strength of bone and the risk of fracture (Castelo, 1998).

Although osteoporosis is generally regarded as a disease of women; up to 30% of hip fractures and 20% of vertebral fractures occur in men. The clinical significance of osteoporosis arises from the fractures that occur. They are very disabling not only for the individual but also for health care systems (Eastell et al., 1998).

Hip fractures are the most serious followed by vertebral ones. About 1.6 million hip fractures were estimated to occur every year. Conservative estimates suggested that within 60 years the number of hip fractures worldwide would rise to more than 6 millions so that osteoporosis has a substantial and ever increasing economic significance (Deal C., 1997).

The major problem in the management of osteoporosis is that the diagnosis is most frequently made only when a fracture has occurred although bone loss ***(which is very slow & asymptomatic***) has been present for many years before it is

diagnosed. For this reason; early recognition of osteoporosis is of great importance in the management of this disorder. Osteoporosis can be diagnosed on the basis of clinical ***(when it becomes symptomatic)*** or radiological assessments. Measuring the bone mineral density (***BMD***) as measured by dual-energy x-ray absorptiometry (***DXA***) is a potentially useful tool in assessing the individual risk of fracture. Moreover; biochemical markers of bone resorption and bone formation may be of some use in predicting the rate of bone loss in healthy and osteoporotic patients and also; the response to therapy. Their use as diagnostic tools however; needs further investigations (Eyer D., 1997).

The philosophy of treatment of osteoporosis nowadays is prevention of the disease progression rather than curing it. In order to decrease the health care burden for fragility and fractures; intervention is best undertaken as early as possible in the natural history of the disease (Abbott et al., 1996).