Evaluation of Bone Mineral Density in Patients with Schizophrenia

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Background: Schizophrenia affects about 1% of the world's population. Those with schizophrenia are at elevated risk of a variety of physical health problems. Bone mineral density is one of these health problems.

Objectives: Evaluation of bone mineral density in relation to relevant endocrinal and biochemical variables in schizophrenic patients who were under treatment by antipsychotic medications.

Subjects & Methods: Fifty-six schizophrenic patients (35 males and 21 females) diagnosed according to DSM-IV criteria were included in this study. They were recruited from Psychiatry Department, Zagazig University Hospitals. Their mean age was 33.8±6.6 years. They were under treatment with antipsychotric medication. They were subjected to Brief Psychiatric Rating Scale and Positive and Negative Syndrome Scale. Bone mineral density was evaluated by Dual Energy X-ray absorptiomerty. Relevant endocrinal and Biochemical variables were assessed.

Results: Osteopenia was found in 62.5% and 53.6% of patients at lumber region and hip bone respectively. Osteoporosis was found in 19.6% and 8.9% at lumber region and hip bone respectively. Male patients had much lower bone mineral density than females. Prolactin serum level was high in 46.43% of all patients, while 25-hydroxy vitamin D was low in 55.4% of all patients. Bone mineral density showed a positive correlation with 25- hydroxy vitamin D levels in females. Bone mineral density showed a negative correlation with age, duration of treatment, negative symptoms' scores and prolactin level in all patients. There was a negative correlation between both follicle stimulating hormone, leutinizing hormone and bone mineral density in males only. No correlation was found between bone mineral density and nicotine consumption, body mass index, osteocalcin and crosslaps levels. There was a significant difference between different antipsychotic medication groups regarding bone mineral density at lumber region.

Conclusion: In this study, high percentage of schizophrenia patients suffered from low bone mineral density. Osteopenia and osteoporosis may be a highly prevalent but significantly underdiagnosed medical condition in schizophrenia patients. Psychiatrists should consider bone mineral density screening among those patients. Dual Energy X-ray absoprtiometry should be added to the routine medical monitoring of patients with schizophrenia as well as relevant hormonal and biochemical measures.

Keywords: Bone mineral density, Schizophrenia, Antipsychotics.

Abbreviations:
BMD: Bone Mineral Density
BPRS: Brief Psychiatric Rating Scale
PANSS: Positive and Negative Syndrome Scale
FSH: Follicle Stimulating Hormone
LH: Leutinizing Hormone
DSM IV: Diagnostic and Statistical Manual of Mental Disorders

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INTRODUCTION

Osteoporosis is recognized as a major public health issue leading to bone fractures, pain and disability. Awareness of an elevated risk of osteoporosis in individuals with schizophrenia is increasing (Halbreich, 2007).

Peak bone mass is established in the first two decades of life, and antipsychotic medication at this stage could therefore have long lasting effects on bone mineral density (Naidoo, et al. 2003).

Bone, both of cortical and trabecular structure, undergoes changes throughout life, called bone remodeling (Parfitt, 1979). This regulatory process of remodeling can be influenced in many ways, and one of the pathological consequences is osteoporosis, defined as an absolute decrease in total bone mass. Osteoporosis is caused either by a greater frequency or reduction of activity of osteoclasts, by a decrease in activity or duration of the action of osteoblasts or a combination of both (Wolinsky Friedland, 1995).

In osteoporosis, bone strength and bone stiffness are so severely deteriorated that fractures can occur with minimal trauma (NIH Osteoporosis prevention, 2000). The most common primary forms of bone loss are age-related and post-menopausal osteoporosis. A main cause of secondy osteoporosis is drug-induced bone loss (Glaser and Kaplan, 1997).