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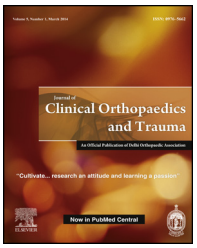

Original Article

A study of the prevalence of osteoporosis and hypovitaminosis D in patients with primary knee osteoarthritis

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ABSTRACT

Introduction: Osteoarthritis and Osteoporosis are highly prevalent disease, so is hypovitaminosis D. We tried to find out prevalence of osteoporosis and hypovitaminosis D in patients suffering from primary knee Osteoarthritis. We also compared the prevalence of oseotoporosis between general population and patients of primary osteoarthritis.

Methods: Patients suffering from primary knee OA were taken from Rheumatology OPD of Medical College Hospital and SSKM Hospital Kolkata, India. For each patient age and sex matched friend or relative of same locality was taken in the study as controls. Hospital staffs that come from different part of state was taken in the study as controls. The control population was the representative of general population.

Results: Total number of participants in this study was 206. Out of which there were 98 cases and 108 controls. BMD status correlates significantly with Primary OA. Serum Vitamin D3 status correlates significantly with Osteoarthritis. Age of the patients correlated significantly with both BMD Status and Knee OA but not with the vVitamin D level. There were significant correlation between the Serum Vitamin D3 status and BMD of the subjects.

Conclusion: Osteoporosis is prevalent both in general population and patients suffering from Knee Osteoarthritis and may increase the disability. The matter is complicated by the fact hypovitaminosis D is also prevalent in the population and positively correlated with both Osteoporosis and osteoarthrosis, though we cannot comment on further pathogenesis because of cross sectional design of the study.

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1. Introduction

Osteoartritis and osteoporosis are highly prevalent diseases. Several investigators have suggested that osteoarthritis (OA) and osteoporosis are mutually exclusive. This hypothesis was originally based on a retrospective radiographic study by Foss and Byers in 1972 documenting the absence of osteoarthritic changes in subjects with hip fracture and several reports on increased bone mineral density (BMD) in subjects with OA.[1] However, recent studies question these earlier results. It was found that increased BMD is present only in the OA-affected joint and not at other sites in a study of monozygotic and dizygotic twins.[2] Similarly, a recent study among post-menopausal women undergoing total hip replacement for advanced OA documented that 25% of these women had occult osteoporosis.[3] And most relevant, in a large prospective cohort study, osteoporotic fracture rates were not reduced in persons with OA.[4] Thus, patients with OA with low BMD at sites other than the affected joint may be at increased risk for fractures.

Hypovitaminosis D may be a risk factor for fractures in older persons with OA.[5] In addition, Vitamin D deficiency may indirectly increase risk of OA progression by contributing to low bone density. Data from the Framingham Study showed that low bone density was associated with an increased risk of OA progression among persons with knee OA.[6] Therefore, low BMD in persons with OA raises two concerns, increased disease progression and increased fracture risk.

We hypothesize that serum 25-hydroxy vitamin D (25[OH] D) levels are positively associated with BMD among persons with OA. If so, Vitamin D supplementation may favourably affect persons with OA through 2 mechanisms. First, Vitamin D may increase BMD and thereby reduce fracture risk. Second, Vitamin D may decrease disease progression in OA, as previously found in the Framingham cohort study.[7]

We tried to find out prevalence of osteoporosis and hypovitaminosis D in patients suffering from primary knee Osteoarthritis. We also compared the prevalence of oseotoporosis between general population and patients of primary osteoarthritis.

2. Material and methods

A. Definition of population
   a. Definition of cases: Patients suffering from knee OA.
   b. Definition of control: For each patient age and sex matched friend or relative of same locality not having osteoarthritis clinically will be taken in the study. Some hospital staffs who come from different part of the state will be taken in the study as controls. The control population is the representative of the general population.
B. Inclusion criteria
   1. Age more than 50
   2. Knee OA
   3. Non smoker, non alcoholic
C. Exclusion criteria
   1. Inflammatory arthritis
   2. Uncontrolled DM, HTN, CKD, uncorrected Hypo/hyperthyroidism
   3. Patients taking steroids or any drug that influence bone health.

Patients suffering from primary knee OA were taken from Rheumatology OPD of Medical College, Kolkata and SSKM Hospital, Kolkata, India. For each patient age and sex matched friend or relative of same locality was taken in the study as controls. Hospital staffs that come from different part of state was taken in the study as controls. The control population was the representative of general population.

Diagnosis of Osteoarthritis was confirmed by ACR criteria. After routine examinations and investigations all patients and controls were subjected to DXA (Dual energy X-ray absorptiometry) scan. Blood samples were taken for Vitamin D measurement.

The study got clearance from Institutional Ethics Committee. Informed consent was taken from all the patients. Patients were diagnosed as having Knee Osteoarthritis using ACR Radiologic and clinical criteria for knee OA.

2.1. *Design*

Hospital based, cross sectional, observational and non randomized study.

2.2. *Statistical analysis*

The analyses were performed with the SPSS (version 16.0).

3. Results and analysis

Total number of participants in this study was 206. Out of which there were 98 cases and 108 controls. Out of the cases, 40.82% were males and 59.18% are females. And among the controls, there were 50% male and 50% female subjects. Majority of the patients were between 50 and 70 years of age both in the case and control group. This age group included 71.43% of the study population and 69.44% of the control population (Table 1).

Table shows that BMD status correlates significantly with Primary OA (p value: 0.000).

18.37% of the subjects in the study group and 19.44% of the subjects in the control group have normal Bone Mineral Density. 32.65% among the cases group and 58.3% among the controls are osteoporotic. And 49.98% among the cases and 22.22% of the controls have osteopenia. Therefore, 81.63% among the cases and 80.55% of the controls have BMD less than 1 standard deviation below the mean for young healthy

Table 1 – Age distribution of the cases.

Age group	Cases	Controls
<50 years	19 (19.39%)	27 (25%)
50–70 years	70 (71.43%)	75 (69.44%)
>70 years	09 (9.18%)	6 (5.56%)