

A Cross Sectional Study on Assessment of Prevalence, Risk Factors and Management of Osteoarthritis in a Tertiary Care Hospital

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Abstract

This study was aimed to evaluate the prevalence, risk factors and management of osteoarthritis (OA) in a tertiary care hospital. A prospective observational cross sectional study was conducted among 68 osteoarthritis patients for a period of 6 months in a tertiary care referral hospital. A data collection form was designed to collect information necessary for the study. We arranged the study into 3 phases as the preparatory, data collection and analytical phase. The prevalence of OA and prevalence of each risk factor to causing OA was separately analyzed. The Management pattern of OA was also evaluated. Among 68 patients selected for the study, 32 patients were from the age group 56-65 followed by the age group 66-75 of 18 patients. Out of 68 patients, 47 patients were females and 21 patients were males. Our study found that 40 patients were overweight, 19 were obese and only 9 were normal weight. The assessment of prevalence of risk factors showed that among the various risk factors, age (36%) was found to be the most statistically significant prevalent risk factor followed by female gender (69%) and trauma (16%). Our study concluded that a high prevalence rate of knee osteoarthritis among elderly. Also females were predominantly affected than men and prevalence of risk factors was also higher in this gender. Excluding female gender, age, trauma, overweight and kneeling were the prominent risk factors.

Keywords

Osteoarthritis, Prevalence, Risk Factor, Management

1. Introduction

Osteoarthritis (OA) is a long-term chronic disease characterized by the deterioration of cartilage, deformities in joints including synovial membrane, subchondral bone, ligaments and periarticular muscles which results in bones rubbing together and creating stiffness, inflammation, pain, and impaired movement [1-2]. About 100 million people suffer from OA and it is ranked as the eighth leading cause of disability. Its epidemiological profile in India is not clear but it is estimated that osteoarthritis (OA) is the second most common rheumatological problem, as well as the frequent joint disease with prevalence of 22% to 39% in India [1].

Worldwide estimates are that 9.6% of men and 18.0% of women aged over 60 years have symptomatic osteoarthritis [2].

Osteoarthritis commonly affects middle aged and elderly but as a result of injury or over use of joints it may begin earlier [3]. The major risk factor of OA is age and is also associated with both modifiable and non modifiable factors like obesity, lack of exercise, genetic predisposition, occupational injury, trauma, and gender. Hence, the present cross-sectional study is aimed to evaluate the prevalence, risk factors and management of osteoarthritis in a tertiary care hospital. This type of prevalence studies have been conducted only in small numbers to date in India especially in Kerala.

2. Materials and Methods

2.1. Study Design

A prospective observational cross sectional study was conducted for a period of 6 months commencing from December 2015 to May 2016 with the aim to study the prevalence, risk factors and management of osteoarthritis in the orthopedic outpatient department of a 750 bedded multispecialty tertiary care referral KIMS AL SHIFA hospital in Kerala.

2.2. Patient Selection

Inclusion Criteria

Patients of either sex attending the orthopedic outpatient department diagnosed with knee osteoarthritis and are willing to take part in the study were included in the study.

Exclusion Criteria

Patients having the privilege of insurance schemes, psychological morbidities, cognitive impairment, tumor, and are not native speakers were excluded from the study in order to prevent bias in the assessment of risk factors as these may interfere with the result.

2.3. Procedure

The study was approved by ethics committee of KIMS AL SHIFA HOSPITAL with no. IEC/KAS/2015/19 on 17/11/2015.

The patients were randomly selected from the outpatient orthopedic department. The nature, type and intention of the study were explained to the patients by direct patient interview. If patients decided to participate, a written official consent form was obtained. A total of 68 patients diagnosed with knee osteoarthritis were enrolled in the trial after obtaining their informed consents.

A data collection form was designed to collect information necessary for the study which focuses on Patient demographics: sex, age, height, weight, BMI, presenting complaints of the patient, past medication history, family history of OA, other relevant risk factors like obesity, trauma, history of injury to the knee, climbing stairs regularly, kneeling, relevant lab investigation data, and medication chart containing name of the drug, dose and frequency.

We arranged the study into 3 phases. First phase was the preparatory phase includes the identification and documentation of risk factors and also gave an insight to the general treatment pattern of OA. This phase also includes preparation of well structured data collection form and patient informed consent form.

Second phase was the data collection phase in which

Patients who satisfied the inclusion and exclusion criteria were included as subjects of the study. The demographic data, details of co-morbid conditions were collected through direct patient and bystander interview. Information regarding the risk factors was prospectively recorded. Prevalence of each risk factor among patients with OA was compared between men and women. Patients case records were reviewed to collect the details of lab tests, medications etc. Third phase was the analytical phase where the collected data were compiled and analyzed using chi square test. The prevalence of OA and prevalence of each risk factor to causing OA was separately analyzed and compared between men and women patients.

2.4. Sources of Data

1. Patient case record.
2. Direct patient and bystander interview
3. Patient prescription

2.5. Data Evaluation

The data collected in the six months was analyzed for the following parameters

1. Age wise distribution of the patients
2. Gender wise distribution of the patients
3. Co-morbid conditions
4. Distribution of body mass index among patients
5. Risk factor assessment
6. Drugs used for the management of OA

2.6. Statistical Analysis

The collected data were compiled using Microsoft excel and were presented in tables, pie charts and bar diagrams. Data's were analyzed using chi square tests.

3. Results and Discussion

3.1. Age Wise Distribution of Patients

Among 68 patients selected for the study, 32 patients (47.06%) were from the age group 56-65 followed by the age group 66-75 (26.47%) of 18 patients (Figure 1). Mean age of patients is 64.18 and SD is 9.22 years. The prevalence rate was very less in patients below 45 years. This result was comparable with the findings of Arvind *et al.*, Nisha *et al.*, that also showed a high prevalence rate of knee osteoarthritis among elderly [4, 5]. A similar study conducted by Pushpa *et al.*, showed that majority of patients with OA were in the age group of 55-59 years [6]. A study conducted by Ganvir and. Zambare observed that the percentage of people affected with OA was more with an increasing age [7].

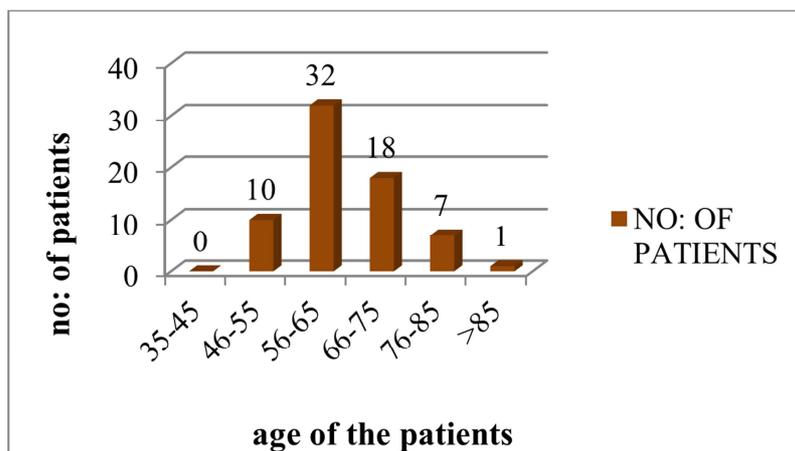


Figure 1. Age wise distribution of patients.

3.2. Gender Wise Distribution of Patients

Both males and females were included in the study. Out of 68 patients, 47 patients (69%) were females and 21 patients (31%) were males. Females in the sample are statistically higher than males ($\chi^2 = 9.941$, d.f = 1, $p < 0.001$). This result was consistent with the study reports of Manojkumar *et al.*, in which they reported more than two third of the study subjects to be females [8].

3.3. Body Mass Index Wise Distribution of Patients

Among 68 patients, our study found that 40 patients (59%) were overweight, 19 (28%) were obese and only 9 (13%) were normal weight. Significantly there is a higher number of

patients in the overweight category in the sample. ($\chi^2 = 52.118$, $df = 3$, $p < 0.001$). Therefore being both overweight and obese can be considered as risk factors for developing OA [9]. According to Anu *et al.*, severity of OA was significantly higher among obese patients compared to the non obese patients [10].

3.4. Co-Morbid Conditions Among Patients

Among 68 patients involved in this study, hypertension and diabetes were the most prevailing comorbid conditions with 51.47% suffering from hypertension and 30.88% having diabetes mellitus and 11.8% from hypothyroidism (Figure 2). ($\chi^2 = 17.121$, $df = 2$, $p < 0.001$). This result was comparable with the findings of Weimin *et al.*, [11].

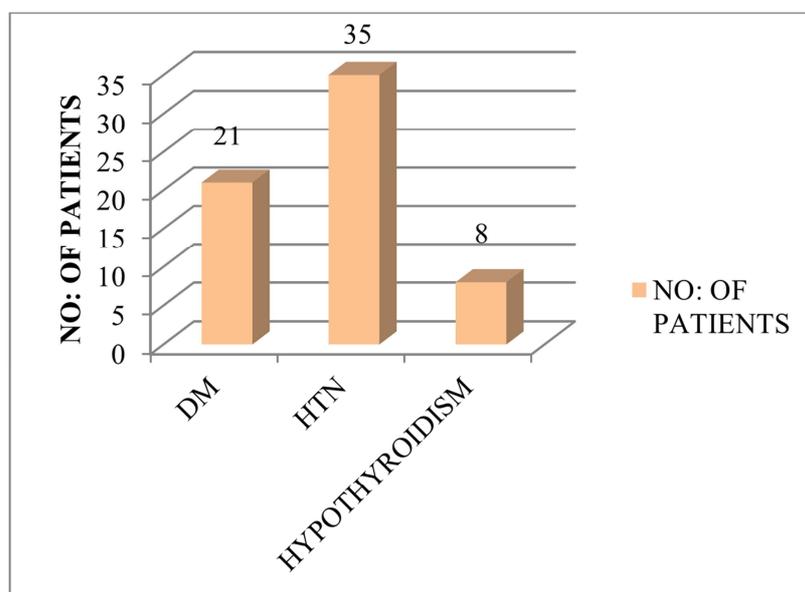


Figure 2. Co-morbid conditions.

3.5. Prevalence of Risk Factors

The assessment of prevalence of risk factors showed that among the various risk factors, age (36%) was found to be the most statistically significant prevalent risk factor

followed by female gender (69%) and trauma (16%) (Figure 3). ($\chi^2 = 163.729$, $df = 8$, $p < 0.001$). All the patients selected were > 35 years and a vast majority being > 45 years. Family history of OA was present only in a few (5.9%). A study conducted by Manoj *et al.*, found that subjects with history of

trauma and fracture were found to be significantly associated with developing OA in the near future [8].

About 32.35% patients were involved in kneeling as part of their religious practice and in various knee bending activities as part of daily life acts or occupational needs, and

hence we could also conclude knee bending and kneeling was contributing to be a risk factor for osteoarthritis. A study done by Cyrus cooper *et al.*, found that occupational knee bending is a positive risk factor for development of OA [12].

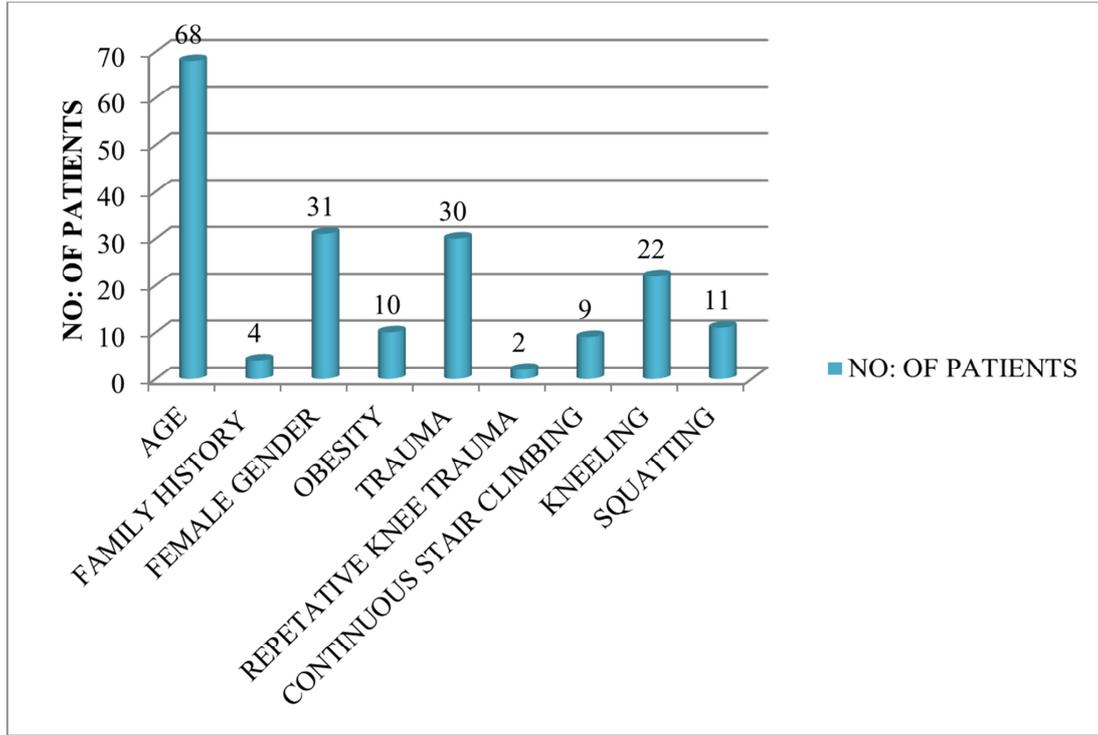


Figure 3. Prevalence of risk factors.

3.6. Comparison of Risk Factors Among Male and Female

In a detailed separate analysis of risk factors in both males and females, a majority of risk factors age, gender and trauma were significant ($p < 0.001$) in females than in males (Figure 4). Also these results were consistent with the observations of Birtwhistle *et al.*, [13]. There was no significant difference detected while comparing the risk factors - family history, gender, obesity, trauma, continuous stair climbing, kneeling and squatting among male and female subjects.

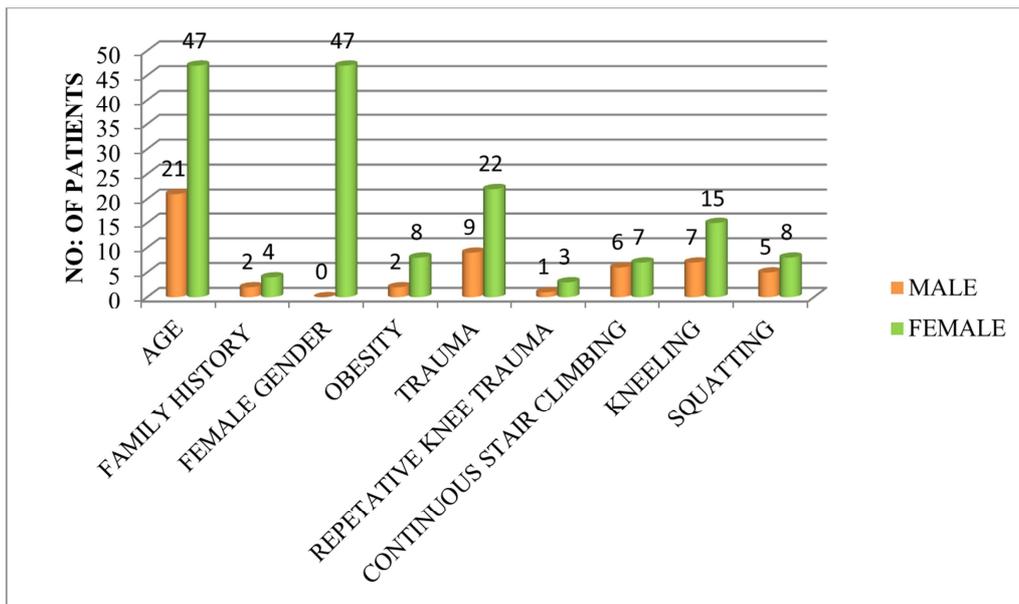


Figure 4. Comparison of risk factors among male and female.

3.7. Erythrocyte Sedimentation Rate Among Patients

Among 68 patients, 13 patients (19.12%) had ESR value in the range of 21-30mm/hr, 10 patients (14.7%) in the range of 31-40mm/hr and 51-60mm/hr, 11 patients (16.17%) in the range of 41-50mm/hr, 9 patients (13.23%) in the range of 61-70mm/hr, 7 patients (10.29%) in the range of 71-80mm/hr, 4 patients (5.88%) in the range of 81-90mm/hr and 3 patients (4.41%) in the range of 91-100mm/hr (Figure 5). The mean ESR value is 51.53 and SD is 20.80. This result shows similarity with findings of Radha and Gangadhar [1].

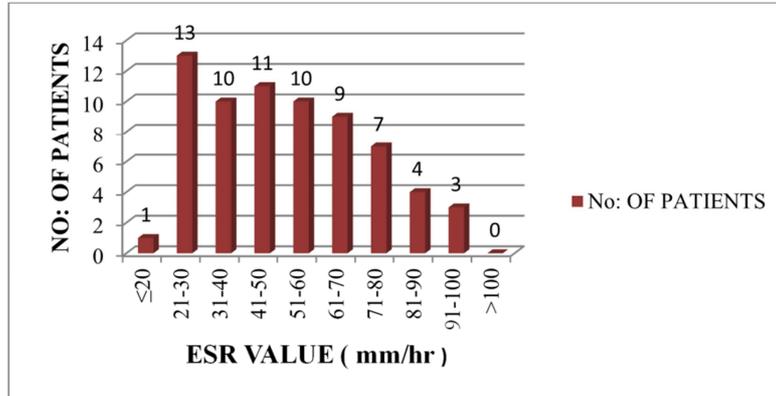


Figure 5. ESR distribution among patients.

3.8. Treatment Pattern of Osteoarthritis

3.8.1. Distribution of Surgical Treatment

The management of OA can be non pharmacological, pharmacological or surgical. About 94% patients underwent surgical therapy and only 6% followed pharmacological therapy. Significantly higher number of patients underwent surgical therapy as the treatment measure. ($\chi^2 = 52.94$, $df < 1$, $p < 0.001$).

3.8.2. Distribution of Pharmacological Treatment

Out of 68 patients, 27 patients (39.70%) were prescribed with NSAIDs, 9 patients (13.23%) with Paracetamol, 4 patients (5.88%) with Tramadol, Flupirtine, Diacerin and topical NSAIDs, 3 patients (4.4%) with Duloxetine. Diacerin an example for SYSADOA has shown to be having both

symptom and structure modifying effects in OA and is supported by the recent EULAR and OARSI recommendations. Karel *et al.*, study results showed that diacerin is safe and effective for the treatment of knee OA and has a long carryover effect [14]. Topical NSAIDs were also prescribed and showed to exhibit equal efficacy as that of oral NSAIDs and had better gastrointestinal safety. This result was comparable with the study of Ullal *et al.*, [15]. Patients after surgery were provided with calcium supplements, calcitriol and vitamin D3 therapy as further added management. Among different medications dispensed, significantly higher number of patients consumed NSAIDs followed by Vitamin D3 and Calcitriol (Figure 6). ($\chi^2 = 75.086$, $df = 8$, $p < 0.001$).

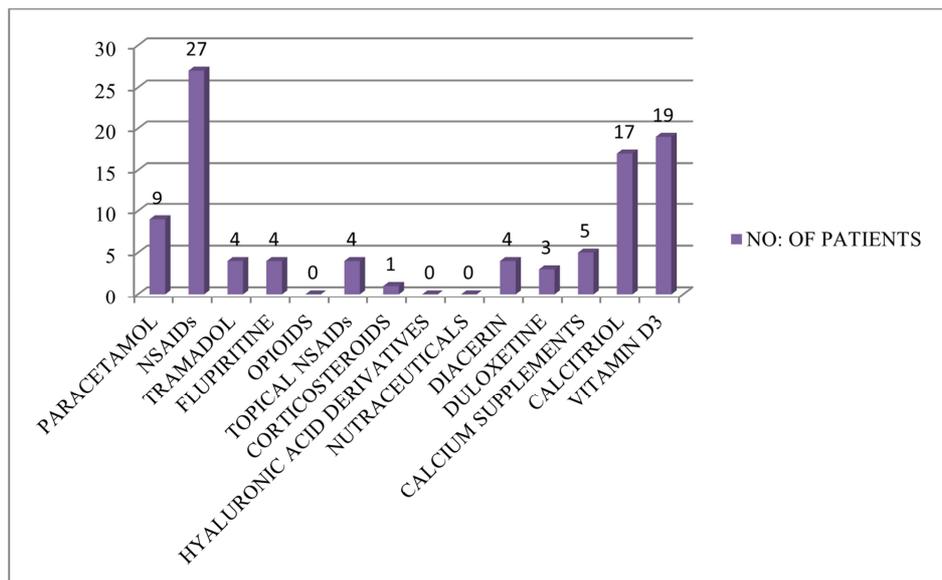


Figure 6. Drugs used in osteoarthritis.

3.8.3. Prescribing Pattern of NSAIDs

Among patients taking NSAIDs, significantly higher number of patients were on Diclofenac therapy compared to other medications. ($\chi^2 = 25.519$, $df = 3$, $p < 0.001$). This result shows similarity with findings of Purushottam *et al.*, [16].

4. Conclusion

Our study concluded that 64.18 ± 9.22 years to be the mean affected age. Also females were predominantly affected than men and prevalence of risk factors was also higher in this gender. Excluding female gender, age, trauma and kneeling were the prominent risk factors. In line with various previous studies we could also conclude that obesity and overweight are contributing factors that can gradually predispose individuals to develop OA in the near future. Majority of subjects showed comorbid conditions like DM and HTN.

ESR, an important indicator of disease progression and present status also showed a mean value of 51.53 ± 20.80 . Treatment analysis gave us an impression that a vast majority of patients underwent surgical therapy while a very small proportion were only on pharmacological therapy which must have been due to the long term relief and improved quality of life patients attain upon surgical intervention. A further detailed analysis of pharmacological agents showed NSAIDs followed by Calcitriol and Vit D3 were the most preferred by physicians and among NSAIDs, Diclofenac being the predominant.

OA can largely be avoided by lifestyle changes and by careful watch on body weight and daily activities. Our study suggested that as the number of people with OA increases with age, preventive measures can be taken in the earlier age groups so that OA can be prevented. Right treatment at the right time at right cost helps patient to manage pain, maintain mobility and minimize disability.

Conflicts of Interest

The authors have none to declare.

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