

Observations on Severe Grades of Knee Osteoarthritis in Patients Residing in Hilly Areas Presenting to a Peripheral Hospital in North Kashmir

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Abstract: ***Purpose:** To observe the severity of knee osteoarthritis in patients residing in the hilly areas presenting to a peripheral rural hospital in North Kashmir. **Patients and Methods:** 100 patients with age more than 40 years with moderate grade (Kellgren-Lawrence grade 3) and severe grade (Kellgren-Lawrence grade 4) osteoarthritis of knees were included in this study. Patient's demographic profile including name, age, sex, residence, occupation and the chief complaints were noted and knees were examined clinically. Knee radiographs were taken and radiographic signs for osteoarthritis were interpreted. Osteoarthritis was graded using the Kellgren and Lawrence grading for osteoarthritis. Flexion deformity and varus deformity was clinically measured. Patients were treated symptomatically for short term pain relief using NSAIDs, Opioid analgesics and intraarticular knee corticosteroid injections. Patients were followed weekly for more than eight visits and option of definitive treatment (i.e; Total knee arthroplasty) was explained and discussed. **Results:** Majority of patients (75%, 75cases) were in the age group of 50-58 years with an average age of 53 years. The number of females was more than males, with a total of 62 females and 38 males. Left knee was predominantly affected in 14% (14 cases), right knee predominantly in 11% (11 cases) and both knees were involved in 75% of the cases. Bicompartement osteoarthritis was seen in 42, while tricompartment osteoarthritis in 58. Grade 3 osteoarthritis was found in 55 and grade 4 osteoarthritis was noted in 45 patients. Fixed flexion deformity (FFD) up to 10 degrees was found in 38 patients, FFD of 10-20 degrees in 22 patients, 20-30 degrees in 17 patients and more than 30 degrees in 12 patients. Varus deformity of <10 degrees was seen in 56 patients, 10-20 degrees in 12 patients and more than 20 degrees in 8 patients. Short term pain relief up to 6 weeks was observed after intraarticular steroid injection in 8 (40%) out of 20 patients with grade 3 osteoarthritis and only 5 (25%) out of 20 patients with grade 4 osteoarthritis. **Conclusion:** Patients residing in the hilly areas present with moderate to severe osteoarthritis at an age between 40-65 years, with a common of tricompartmental involvement. Walking through uphill and downhill is considered as a risk factor for such severe grades of osteoarthritis. Intraarticular knee corticosteroid injection provides a short term pain relief in only a few cases of moderate to severe osteoarthritis. Varus and fixed flexion deformities are common in such severe grades of osteoarthritis.*

Keywords: Knee Osteoarthritis, Hilly regions, Kellgren-Lawrence grade, Intraarticular knee corticosteroid injection

1. Introduction

Osteoarthritis (OA) is a chronic disorder of synovial joints in which there is progressive softening and disintegration of articular cartilage accompanied by new growth of cartilage and bone at the joint margins (osteophytes), cyst formation and sclerosis in the subchondral bone, mild synovitis and capsular fibrosis⁽¹⁾. Knee osteoarthritis is the most common type of arthritis diagnosed. It is typically the result of wear and tear and progressive loss of articular cartilage. The age at onset for knee OA in the majority of the cases is more than 40 but it can occur within the young. Both genders can be affected but women can be affected much more than men. The most common symptom in the patients with knee OA is mechanical knee pain. In physical examination, crepitus on knee motion is the most common finding. Bony tenderness and bony enlargement in joint line are the other findings. During flare up of osteoarthritis, knee can show swelling due to joint effusion.

The major X-Ray findings of OA are narrowing of the joint space, eburnation or subchondral bone sclerosis, osteophytes and subchondral bone cysts.

2. Patients and Methods

This hospital-based study was conducted at a Peripheral Rural Hospital of North Kashmir in the region of Uri, from June 2018 to May 2019. The study included 100 patients: 38 males and 62 females, aged between 40-65 years. People living in a number of small villages of hilly regions were included.

Inclusion Criteria:

1. Age group: 40-65 years
2. Both sexes.
3. Primary Osteoarthritis.
4. Kellgren-Lawrence grade 3 and grade 4 Osteoarthritis.
5. People living in the hilly regions.

The exclusion criteria were Age <40 years, people living in the plains, Secondary osteoarthritis after trauma, Rheumatoid arthritis, and Early stage Osteoarthritis (Kellgren-Lawrence grade 0, 1 and 2).

100 patients of both sexes with age more than 40 years were included in this study. The patients were selected on the basis of severity of symptoms and the radiographic features of severe grades of osteoarthritis. Patient's

demographic profile including name, age, sex, residence, occupation and the chief complaints were noted and knees were examined clinically. The history included: the onset of symptoms, specific location of pain, duration of pain and symptoms, characteristics of the pain, alleviating and aggravating factors, any radiation of pain, severity of symptoms, and the patient's functional activity. Palpation along the bony and soft tissue structures of the knee was done. Pain and swelling of knees, difficulty in getting up from standing position, difficulty in squatting, difficulty in going upstairs and downstairs and difficulty in climbing uphill and going downhill, cold sensation in knees and legs, crepitus on knee motion, bony tenderness, and bony enlargement were main symptoms and signs noted in the patients. Range of motion (ROM) of the knee was examined. Active and passive ROM with regard to flexion and extension was assessed and documented.

Knee radiographs in two views – anteroposterior and lateral, were performed and OA was graded using the

Kellgren and Lawrence scale for OA. Only patients with moderate grade (Kellgren-Lawrence grade 3) and severe grade (Kellgren-Lawrence grade 4) knee osteoarthritis were included in this study.

Patients were treated symptomatically for short term pain relief using NSAIDs, Opioid analgesics and intraarticular knee corticosteroid injections. Among NSAIDs, Etodolac 600mg extended release tablets were prescribed for as short course therapy for 10 days along with PPIs. Thereafter opioid analgesics like tramadol tablets were given for 2-3 weeks. Intraarticular knee steroid injection was used in 20 patients with grade 3 OA and 20 patients with grade 4 OA.

Patients were followed weekly for more than eight visits and options of definitive treatment like total knee arthroplasty were explained and discussed.

3. Observations and Results

Age Distribution: Table – 1

Age in years	No. of patients	Percentage
40-50	32	32
51-60	54	54
>60	14	14

Gender Distribution: Table – 2

Gender	No. of Patients	Percentage
Males	38	38
Females	62	62

Side Distribution: Table – 3

Side involved	No. of patients	Percentage
Right	11	11
Left	14	14
Both sides	75	75

Type of Involvement: Table – 4

Extent of involvement	No. of patients	Percentage
Bicompartmental	42	42
Tricompartmental	58	58

Grade of Osteoarthritis: Table – 5

Grade of osteoarthritis	No. of Patients	Percentage
Grade 3	55	55
Grade 4	45	45



Kellgren-Lawrence Grade 4 Knee Osteoarthritis: Large osteophytes, marked joint space narrowing, severe sclerosis and definite deformity of bone ends.



Kellgren-Lawrence Grade 3 Knee Osteoarthritis: Moderate multiple osteophytes, definite joint space narrowing, some sclerosis and possible deformity of bone ends.

Intraarticular Steroid: Table – 6

Intraarticular steroid given	No. of Patients
Grade 3 osteoarthritis	20
Grade 4 osteoarthritis	20

Relief of Symptoms after Intraarticular Steroid: Table – 7

Relief of symptoms	No. of Patients	Percentage
Grade 3 osteoarthritis	8	40
Grade 4 osteoarthritis	5	25

For flexion deformity, the patient was viewed from the side and the flexion deformity was measured as an angle between long axis of thigh and long axis of leg.

Fixed Flexion Deformity (FFD): Table – 8

FFD	No. of Patients	Percentage
Upto 10 degrees	38	38
11-20 degrees	22	22
21-30 degrees	17	17
>30 degrees	12	12



Figure: Fixed Flexion Deformity

For varus deformity, the midpoint between the anterior superior iliac spine and the pubic tubercle was marked as the hip center. The center of the knee was marked as the point between the medial and lateral border of the knee.

The point in the anterior ankle between the medial and lateral malleolus was marked as the center of the ankle. Varus deformity was measured as an angle between the line from hip centre to the centre of knee and from center of knee to center of ankle. Varus deformity of <10 degrees was seen in 56 patients, 10-20 degrees in 12 patients and more than 20 degrees in 8 patients.



Figure: Varus Deformity

4. Discussion

Knee osteoarthritis is the most common type of arthritis diagnosed. Depending on the source, roughly 13% of women and 10% of men 60 years and older have symptomatic knee osteoarthritis. Among those older than 70 years of age, the prevalence rises to as high as 40%. The prevalence of knee osteoarthritis in males is also lower than in females. Interestingly, not everyone who demonstrates radiographic findings of knee osteoarthritis will be symptomatic. One study found that only 15% of patients with radiographic findings of knee OA were symptomatic. Not factoring in age, the incidence of symptomatic knee osteoarthritis is roughly 240 cases per 100,000 people per year^(2,3).

For knee osteoarthritis, strong evidence indicates a variety of moderate to strong risk factors, including age, female

sex, obesity, previous knee injury and high occupational load⁽⁴⁾. The occupational physical activities include monotonous motions and great forces such as kneeling, squatting on joints,⁽⁵⁻⁶⁾ Climbing,⁽⁷⁾ and heavy weight lifting. Age is one of the most evident risk factors for osteoarthritis. The increasing incidence of osteoarthritis with age is a result of cumulative exposure to various risk factors and biological age-related changes in the joint structures⁽⁸⁾.

In our study, the majority of cases (75%, 75 cases) were in the age group of 50-58 years with an average age of 53 years. The present study found that all the cases were residing in the hilly regions and were vigorous hill walkers during most of their life time. There was a positive association between radiographic severity, pain severity and difficulty in walking uphill and downhill.

In our study, OA was present in 62% of females, whereas it was present in only 38% of males. Women are more frequently affected than males and the disease is to a large extent associated with the modifiable risk factors obesity, previous knee injury and high occupational load⁽⁹⁾. The high incidence of OA in women, especially after menopause, has suggested that estrogen deficiency plays a role in causing disease. Cohort studies have reported that women taking estrogen have a decreased prevalence⁽¹⁰⁾. Recently, a cohort study done by Martin et al. showed that BMI is positively associated with knee OA in women and suggested that more active individuals have lower risk of knee OA⁽¹¹⁾. In a meta-analysis done by Blagojevo et al., it showed that BMI is a risk factor for OA⁽¹²⁾.

Intra-articular injection of steroid is a common treatment for osteoarthritis of the knee. Clinical evidence suggests that benefit is short lived, usually one to four weeks⁽¹³⁾. In our study, Short term pain relief was observed upto 6 weeks after intraarticular steroid injection in 8 out of 20 patients with grade 3 osteoarthritis and only 5 out of 20 patients with grade 4 osteoarthritis.

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