Profile of patients with osteoarthritis of knee

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Abstract

Introduction: Severe radiological osteoarthritis (grade 3 or grade 4) was uncommon under age 45 years. Overall, differences between men and women were small except for hips and knees; however, severe radiological osteoarthritis was found in a higher proportion in most of the joints in women.

Methodology: The study was conducted on patients attending orthopaedics outpatient department, who had early osteoarthritis knee diagnosed by American College of Rheumatology Criteria and staged as per Ahlbacks radiological grading. The sample size studied was 32 patients of which 16 patients in each group.

Results: In our study all the patients had osteoarthritis in both the knees with 10 patients having more involvement of the right knees and left knees were involved in 6 patients in Group 1 and in Group 2 the predominance of involvement of the side was equal between right and left knees with 8 patients each having more involvement on right or left knees.

Conclusion: In our study group 1 had 5 patients grade 1, and 11 patients had grade 2 of Ahlbacks grading of osteoarthritis knee.

Keywords: Ahlbacks grading, osteoarthritis knee, radiological osteoarthritis

Introduction

Osteoarthritis (OA) is a chronic degenerative disorder that is characterized by a loss of articular cartilage [1], in the synovial joints which is characterized by sclerosis subchondral bone thickening, marginal osteochondral outgrowths (osteophytes). Several risk factors have been identified, such as obesity, occupation, higher age, biomechanics and increased dynamic loading of the joint and joint injury, and involves the weight bearing joints like hip and knee joint [2].

The ageing is not the sole predictor of the disease and the only risk factor, but play an important role in early symptomatic appearance of the disease, which cannot be ignored [3]. Because, with ageing there is decrease in the chondroitin sulfate and hyaluronic acid which replaces the keratin sulfate. Osteoarthritic cartilage lesions show a decrease in chondroitin sulfate concentration and chain length and a decreased ratio of chondroitin sulfate to compounds containing keratin sulfate plus glycoprotein.

The progressive fatigue failure with associated changes in the structure of cartilage due to altered chondrocyte metabolism causes the reduction in biomechanical properties with age. Boschetti et al [4] in their study reported that the biomechanical properties (the static compressive modulus, the dynamic compressive modulus and the static tension modulus) of the osteoarthritic cartilage were inferior to that of the normal cartilage.

Van Saase et al in their survey in 1989 showed that the women were at a higher risk of having severe OA. The prevalence of mild and severe radiological osteoarthritis was investigated in a random sample of 6585 inhabitants of a Dutch village using the criteria described by Kellgren and Lawrence [4]. The prevalence of radiological osteoarthritis increased strongly with age and was highest for cervical spine (peak: men 84.8%, women 84.3%), lumbar spine (peak: 71.9%, women 67.3%), and distal interphalangeal joints of the hands (peak: men 64.4%, women 76%).

Severe radiological osteoarthritis (grade 3 or grade 4) was uncommon under age 45 years. Overall, differences between men and women were small except for hips and knees; however, severe radiological osteoarthritis was found in a higher proportion in most of the joints in women.
Srikanth et al. In 2005 studied the sex differences in osteoarthritis (OA) by performing a meta-analysis of sex differences in osteoarthritis prevalence, incidence and severity of osteoarthritis. They conducted a MEDLINE search (1966-2003) retrieving all studies regarding epidemiology of OA during that period. Their results demonstrated the presence of sex differences in OA prevalence and incidence, with females generally at a higher risk. Males had a significantly reduced risk for prevalence of OA in the knee. Females, particularly those >55years, tended to have more severe OA in the knee than the other sites.

The treatment for the osteoarthritis include physical exercise, bracing, anti-inflammatory drugs and intra articular injections. Non-steroidal anti-inflammatory drugs (NSAIDs) are often used in conservative management to relieve pain. Paracetamol (Tylenol/acetaminophen), is commonly used to treat pain from OA.

Physical therapy and rehabilitation may provide short-term pain relief. Bosomworth et al. found that moderate exercise led to improved functioning and decreased pain in people with osteoarthritis of the knee. For individuals without osteoarthritis, strong level II evidence was found (limited by problems with blinding and randomization) and for those with pre-existing knee osteoarthritis, robust level I evidence was available. Patients with established osteoarthritis were shown to derive uniform benefit to physical functioning, with reduction of pain and disability, using aerobic, muscle strengthening, aquatic, or physiotherapy-based exercise modalities. Provided trauma was avoided, moderate exercise did not lead to acceleration of knee osteoarthritis, whether or not there is evidence of pre-existing disease. In either case there appeared to be improved physical functioning and reduction of pain and disability in those who exercised [35]. Other modalities studied in the treatment of osteoarthritis are glucosamine, chondroitin sulphate or both combined. However, most treatments do not modify the natural history or progression of OA, and thus are not considered curative.

Recently platelet rich plasma and mesenchymal stem cells (MSCs) have been used as cellular vectors in the treatment of osteoarthritis as a disease modifying modality.

Methodology:
Our study was prospective randomised double blinded comparative study between use of autologous mesenchymal stem cells with platelet rich plasma (PRP) and platelet rich plasma alone in early osteoarthritis knee. A total no. of 32 patients were studied and they were randomised into two groups group 1 mesenchymal stem cells with platelet rich plasma and group 2 platelet rich plasma alone in early osteoarthritis knee. The mean age of the patients was 52.38years (SD± 7.839) with a range of 42-66 years. Group 1 mean age was 53.14 (SD± 7.35) years and in group 2 was 51.44 (SD± 7.839) years. The two groups were comparable in terms of body mass index with statistically significant difference with p value 0.747 was observed.

Height
Mean height of the patients was 160.25cm (SD± 6.90cm) in group1 and mean height of 162.43cm (SD±6.50cm) in group2. The two groups were comparable in terms height and no significant difference was observed between the groups with p value 0.364.

Weight
Mean weight in group1 was 68.5kg (SD± 7.74kg) and in group 2 the mean weight was 73.81kg (SD± 7.05kg). The two groups were also comparable in terms of weight with no significant difference observed with p value 0.51.

Body Mass Index (BMI)
In group 1 the mean BMI was 26.75 kg/m² (SD± 2.32) and group2 BMI was 28.00kg/m2 (SD± 2.89). Two groups were comparable in terms of body mass index with statistically insignificant with p value of 0.188.
Sex distribution
In group 1 all patients were females and group 2 included 13 females and 3 male patients. The two groups were comparable which was statistically insignificant (p=0.226)

Table 2: Distribution of sex in study groups

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>Number</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>100.0%</td>
<td>81.3%</td>
</tr>
<tr>
<td>Male</td>
<td>Number</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>0.0%</td>
<td>18.8%</td>
</tr>
</tbody>
</table>

Side Wise Distribution of the Knees
All our patients in both groups had involvement of osteoarthritis in both the knees

Table 3: Knee distribution in the study

<table>
<thead>
<tr>
<th>Knee</th>
<th>Bilateral</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Grading of Osteoarthritis
In group1 5 patients had Ahlback grade 1 and 11 patients Ahlback grade 2 osteoarthritis whereas group 2 had 6 patients of grade 1 and 10 patients grade 2 osteoarthritis of knee. The two groups were comparable in terms of ahlbacks grading and no significant difference was observed with p value of 0.710.

Table 4: Ahlback’s grade * Group Crosstabulation

<table>
<thead>
<tr>
<th>Ahlback’s grade</th>
<th>Group 1</th>
<th>Group 2</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>Number</td>
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<td>6</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>31.3%</td>
<td>37.5%</td>
</tr>
<tr>
<td>Grade 2</td>
<td>Number</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>68.8%</td>
<td>62.5%</td>
</tr>
</tbody>
</table>

Discussion
The age ranges in our study in group 1 is with a mean of 52.38years (SD=7.839) and in group 2 with a mean age of 51.44 years (SD=8.44). Our study included the patients with early osteoarthritis (Ahlbacks grade I and II), so the mean age of the sample was lower than that of the general osteoarthritic population. A previous study done found that the radiographic prevalence of knee OA to be 37.35% (n=532) in 60-69 years population. A previous study done found that the radiographic grading of osteoarthritis knee. In our study all the patients had osteoarthritis in both the knees with 10 patients having more involvement of the right knees and left knees were involved in 6 patients in Group 1 and in Group 2 the predominance of involvement of the side was equal between right and left knees with 8 patients each having more involvement on right or left knees. In a study by Michael et al [9] they found that in men, the right knee is more commonly affected; in women, the right and left knees are affected with nearly equal frequency.

Conclusion
In our study group 1 had 5 patients grade 1,and 11 patients had grade2 of Ahlbacks grading of osteoarthritis knee. Group 2 had 6 patients of grade 1, and 10 patients of grade 2 Ahlbacks grading of osteoarthritis knee.

References