Comparative Evaluation of Symptom Relief and Disease Modifying Effect of Chondroitin with Glucosamine sulfate and Diacerein in Osteoarthritis Knee

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ABSTRACT

Background and Objective: Osteoarthritis [OA] is one of the most common joint disease which has led to great morbidity and disability. Symptomatic Slow acting drugs for osteoarthritis which includes glucosamine sulphate and related compounds, chondroitin sulphate, and diacerein have been found to provide symptom relief and possible structure modifying effects in OA knee. This study compared the efficacy and safety of chondroitin sulphate with glucosamine and diacerein in Kellgren Lawrence grade II & III OA knee patients.

Material and Methods: After approval from IHEC and after getting written informed consent, patients were randomized to group A – Tab Chondroitin sulphate (400mg) with Glucosamine (500 mg) combination thrice a day or group B - Cap Diacerein 50 mg, twice a day orally both after food. Out of 88 patients screened 75 of them entered the study. A total of 15 patients failed to complete the study. Remaining 60 patients completed the study with 30 patients in each group. They were assessed clinically using WOMAC index from baseline and followed at 3, 12, and 24 weeks.

Results: Baseline characteristics in both the groups were matching without any significant difference. When compared to baseline at 24 weeks there was reduction in WOMAC from 63.5±4.29 to 20.8±3.19 (67.24%) in group A and from 64.3±3.43 to 33.56±6.03 (47.81%) in group B. There was significant difference between the groups with group A significant over group B in WOMAC scores with p<0.001. Thus the effect of drug therapy on group A was greater than group B.

Conclusion: The use of Chondroitin sulphate with Glucosamine combination caused improvement in WOMAC scores better than Diacerein in osteoarthritis knee.

Keywords: WOMAC, Diacerein, Chondroitin sulphate, Glucosamine, Osteoarthritis

INTRODUCTION

Osteoarthritis [OA] one of the most common joint disease has been a burden to the healthcare society both physical and psychological. The reported prevalence of OA in India is 22–39% which accounts for 30% of all rheumatological problems.1 Indians have a higher incidence of OA of the knee joint, while involvement of the hip joint is less common in comparison to Western populations.2 This has led to great morbidity and disability in the community.

OA can be managed by both non-pharmacological and pharmacological interventions. The non-pharmacological interventions includes weight reduction, education programs, exercise, and lifestyle changes; pharmacological treatments includes paracetamol, nonsteroidal anti-inflammatory drugs [NSAIDs], topical medication and invasive interventions like intra-articular injections, lavage.3 These are only palliative and provide only symptomatic relief.

NSAIDs are the most commonly prescribed drugs for OA. They have an advantage of providing symptomatic relief but do not prevent progression...
 Patients were randomised using randomization tables generated using MS Excel with rand function. They were allotted to either group A – tablet chondroitin sulphate (400 mg) with glucosamine (500 mg) to be taken thrice a day after food or group B - capsule diacerein 50 mg, twice a day orally after food.

WOMAC Index was used for clinical assessment of the patients. It is a functional assessment scale, which contains 24 questions (Q). For pain (Q1–5), stiffness (Q6–7), and physical function difficulty (Q8–24) pertaining to the knee joint. The response was graded on a qualitative scale (0-none, 1- mild, 2 -moderate, 3 - severe, 4-extreme). The maximum score could be 96. 

Western Ontario and McMaster University Osteoarthritis Index (WOMAC) assessment and radiological assessment of knee(s) was done at the first visit. Tablet paracetamol was given to the patients for pain relief during the initial one week of the study period after which patient was allowed to take it as and when needed. Patients were advised to come for follow up on week 3 (visit 2), week 12 (visit 3), week 24 (visit 4) and WOMAC index assessment for clinical efficacy was done. The patients were advised to report immediately on experiencing any adverse event during the study period. At the last visit of study period (24th week) drug therapy was withdrawn.

Statistical analysis was carried out using Microsoft Excel 2010. The p value < 0.05 was taken as significant. Data expressed as mean ±SD and proportions. Student t test was used to compare data between the groups with respect to their means. Chi-square test was used to compare data between the groups with respect to their proportions.

RESULTS

A total of 88 patients were screened for eligibility, out of which 75 patients who satisfied the criteria were included in the study and were randomized to either group A or group B.

A total of 60 patients completed the study. Fifteen patients were lost to follow-up (7 in group A and 5 in group B) and 3 in group B discontinued the drug due to diarrhoea.

Baseline characteristics of the patients are presented in Table 1. There were no significant differences between groups in the baseline parameters.
### Table 1: Baseline characteristics of the patients

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A n=30</th>
<th>Group B n=30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>50.63±5.94</td>
<td>51.36±4.28</td>
</tr>
<tr>
<td>Gender(F:M)</td>
<td>22:8</td>
<td>18:12</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>65.75±7.61</td>
<td>67.83±5.49</td>
</tr>
<tr>
<td>Height, cm</td>
<td>155±5.55</td>
<td>155.5±5.00</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>27.38±2.73</td>
<td>28.01±1.65</td>
</tr>
<tr>
<td>Kellgren-Lawrence Grade II</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>Kellgren-Lawrence Grade III</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Right knee</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Left knee</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Bilateral Knee</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Disease duration(years)</td>
<td>2.96±1.22</td>
<td>2.73±1.33</td>
</tr>
<tr>
<td>Diabetes</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Hypertension</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Visual Analogue Scale(VAS)</td>
<td>6.76±0.73</td>
<td>6.8±0.41</td>
</tr>
<tr>
<td>WOMAC (combined)</td>
<td>63.5±4.29</td>
<td>64.3±3.43</td>
</tr>
</tbody>
</table>

n = number of patients

There were no significant difference in baseline values for the efficacy parameters as well. Baseline scores for WOMAC (63.5±4.29) in group A were comparable with WOMAC (64.3±3.43) in group B.

At 24 weeks there was reduction in WOMAC 63.5±4.29 to 20.8±3.19 (67.24%) in group A and from 64.3±3.43 to 33.56±6.03 (47.81%) in group B as shown in table 2. There was significant difference between the groups in WOMAC scores at third week (45.5±4.06) and 24th week (20.8±3.19) in group A (p<0.001, Table 2). Thus the efficacy in group A on function improvement with WOMAC scale was greater than group B. These changes in WOMAC scores in group A and B (Figure 1)

### Table 2: WOMAC scores in the groups

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 0</td>
<td>63.5±4.29</td>
<td>64.3±3.43</td>
<td>0.43</td>
</tr>
<tr>
<td>Week 3</td>
<td>45.5±4.06</td>
<td>56.3±5.17</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Week 12</td>
<td>35.86±3.51</td>
<td>44.96±5.72</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Week 24</td>
<td>20.8±3.19</td>
<td>33.56±6.03</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

Values are in mean ± SD ; *Student t test used.

### DISCUSSION

SYSADOA have a slow onset of clinical efficacy when compared to NSAIDS and once the administration is stopped they show carry over effect. The main rationale for using SYSADOA is to reduce the use of NSAIDs thereby limiting the risk of upper gastrointestinal tract erosions, ulcers and deleterious renal effects in elderly patients.13

The treatment groups had symptomatic OA with mean WOMAC score of > 60 at baseline. Our study
showed improvement in WOMAC scores during the course of the treatment till 24 weeks i.e. the end of the study.

The findings of WOMAC scores in group A patients was similar to Glucosamine/chondroitin Arthritis Intervention Trial. The findings of efficacy parameters WOMAC index of diacerein was similar to an Indian study. The same was also discussed in a review of clinical efficacy and safety of diacerein in OA in 2010. The symptomatic benefit provided by diacerein in terms of pain reduction was found to be minimal which was discussed in an earlier Cochrane study.

In contrast to the above findings, Wandel et al in his study had shown that chondroitin sulphate and glucosamine did not reduce the joint pain.

Irrespective of the differing healthcare policies and treatment standards internationally, our aim should be to identify the best-available treatment practices for knee.

The limitations of our study were small sample size, limited period of study and lack of a control group.

Thus further studies with large sample size with long term follow up have to be done to confirm the findings of our study.

We conclude that chondroitin sulphate with glucosamine combination is effective in the treatment of osteoarthritis knee compared to diacerein as the combination showed improvement of symptoms and functional disability as assessed by WOMAC index.

ACKNOWLEDGEMENT

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CONFLICTS OF INTEREST

None.

References