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Level of Pain and Physical Function of Patients with Knee Osteoarthritis Receiving Physiotherapy with and without Intra-Articular Injection in Pakistan: A Qusai Experimental Study

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Abstract

Background/objectives: Few Investigations include a comparison of a conservative approach in the effectiveness of treatment for OA of the knee. Advantageous interventions may reduce the disability associated with OA of knee and need for more invasive treatment. The objective of the current study was to determine and compare the level of pain and physical function of patients with knee osteoarthritis receiving physiotherapy with and without intra articular injections in Lahore, Pakistan.

Material and method: This experimental study conducted among knee OA patients of orthopedic clinics, physiotherapy and rehabilitation centers of Pakistan. 44 patients participated in the study. Patients of knee OA were equally divided into two groups A and B for the treatment of physiotherapy and a combination of physiotherapy plus intra articular injection respectively. Before treatment patients, physical functioning and pain score was measured by WOMAC and VAS scale. The intervention was applied according to given protocols. After treatment of 8 weeks, physical function and pain score was measured again by WOMAC and VAS scale to compare the result of both treatments.

Result: The Improvement in VAS score in Group A was 2.81 ± 1 and in Group B was 3.4 ± 0.69 whereas improvement in WOMAC score in Groups A was 13.23 ± 8.29 and in Group B was 19.14 ± 5.92 . P value calculated through independent sample t-test (0.02 and <0.009) show that there is a significant difference in the improvement level in both groups and improvement in Group B is significantly better than in Group A.

Conclusion: Patients in both groups showed improvement in terms of pain and disability but the improvement in Group B was more as compared to improvement in Group A.

Keywords: Healthcare systems; Kuwait; Population

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Introduction

Joint is where more than two bones meet. It permits the bones to move freely, within safe limits. The knee is one of the most complex and largest joints in the body. It consists of patellofemoral and tibiofemoral joints. It must be strong enough to take our weight and must lock into position for the purpose to stand us upright. It also has to act as a hinge so we can walk and

must withstand extreme stresses, such as when we run or play sports. The knee is endangered to injury and also to develop a condition, OA [1].

Osteoarthritis is a chronic disorder characterized by joint pain and inflammation, increasing physical disability and continuous cartilage degeneration [2].

Risk factors or causes include prior injury to joint, abnormal

development of limb or joint, and also inherited factors. Overweight or obese, a person with leg length discrepancy, and have jobs with a high level of joint stress are at a higher risk to develop this condition. Knee OA affects almost 13% of women and 10% of men having aged over 60 years or more. Sign and symptoms of disease change into severity over time [3].

We aimed to check the physical function and level of pain in the knee osteoarthritis patients, receiving physiotherapy with and without intra-articular injections. The Prevalence of OA is in between 10% in the United States and 2.8% in South Asia and in some areas of Iran is in 19.3%, and figure reaches 43% in the middle-aged Iranian population. This condition contains harmful effects on an individual's life and may affect the person to early retirement or loss of a job. Several treatments have been planned including medical and surgical treatments, also in terms of patient education and physical agent modalities, to overcome this medical condition. The intra-articular injection is one of the less belligerent approaches that may delay the knee replacement procedure in selected cases [4].

Knee osteoarthritis develops when the protective cartilage wears away on the end of the bones. The bones in the knee then rub against one another, causing stiffness, pain and a reduction in the range of movement. The usual treatment of knee OA usually includes medications, physical therapy, and other alternative medical interventions. Treatment modalities divided broadly into two main groups that are conservative and surgical. In addition to pharmacological or non-pharmacological therapies, conservative management also included intra articular therapies, directly delivered to the joint [5].

Although oral analgesics, such as NSAIDs can attain moderate relief of pain and slight functional improvement, with some limitations. Physical therapy and other alternative medical interventions are effective with short and long term effects. Education, self-management, weight loss and exercises are some major initial conservative recommendations. Exercises play an important role in the strengthening of muscles and to improve the range of motions. Although sometimes PT does not meet enough improvement. Under such circumstances, the potential treatment may switch to therapeutic exercise plus an intraarticular injection of different corticosteroids and other agents, lead to significant improvement in pain and function and is harmless to use in the previous report [6].

The main aim of the treatment should be, reducing or eliminating pain, limit functional impairment and to improve joint mobility. It can be accomplished by means of treatment options such as, pharmacological and non-pharmacological. Conservative treatment is valuable for patients at an early stage of disease (KL grade 1-3. However, surgical treatment is needed as a definitive option in the advanced stage of OA (KL grade 4) [7].

Although, the effectiveness of various drugs of IA therapies remains debatable among establishments because of important alterations in the interpretation of evidence [7].

This study focuses on current options for the conservative treatment of OA, discussing the role and potential advantage of Physiotherapy and Intraarticular injections over each other. In

the present study, the effect of Physiotherapy and Intraarticular therapies will be examined on the level of pain and function of the knee joint in a patient with Knee OA. Another aim of the study is to offer an adequate, symptomatic relief, altered disease progression and have limited side effects. The study will also help the future researchers, by giving a baseline idea, to associate the other factors for pain management, for rehabilitation purpose and to improve quality of life. The objective of the present study was to determine and compare the level of pain and physical function of patients with knee OA receiving physiotherapy with and without intra articular injections in Pakistan [8].

Methodology

This quasi-experimental study was conducted among knee OA patients of orthopedic clinics, physiotherapy and rehabilitation centers [9]. The study started after the approval of synopsis. Duration of data collection was 6 months. A sample size of 44 participants with the age group of 45 to 65 years old was included which was selected by convenient based sampling method [10,11]. While Knee OA patients with Steroid injection in the previous 6 months, fractures, trauma or any other pathological conditions including Rheumatoid arthritis (current or past history) were excluded [12-14]. The Visual Analogue Scale (tool) was used to measure the level of pain as a mild, moderate, severe category [15]. The WOMAC questionnaire (tool) was given to participants to measure the physical function by dividing individual score/ total score and multiply by 100. This is a valid questionnaire [16]. Before data collection consent form was filled by the participants.

In this study, patients of knee OA have equally divided into two groups A and B for the treatment of physiotherapy and a combination of physiotherapy plus intraarticular injection respectively. Before treatment patients, physical functioning and pain score was measured by WOMAC and VAS scale. The intervention was applied according to given protocols. After treatment of 8 weeks, physical function and pain score was measured again by WOMAC and VAS scale to compare the result of both treatments. More scoring of WOMAC and VAS scale justify that which treatment was more effective.

Statistical Procedure

The data were analyzed through SPSS version 21. The intergroup treatment was analyzed through a paired sample t-test. The intragroup treatment was analyzed through an independent sample t-test [17].

Results

A total of 44 participants with knee OA participated in the study. 22 participants were in Group A and 22 were in Group B. In Group A, 8(36.4%) were males and 14(63.6%) were females and in Group B 7(31.8%) were males and 15(68.2%) were females. The mean age of participants in Group A was 63.55 ± 7.1 and in Group B was 60.23 ± 7.62 . Participants were selected from six different hospital settings including CMARTH, Hameeda Memorial, Kherunnisa hospital, LGH, SIMS, and Sir Ganga Ram Hospital.

In Group A, The mean score of VAS pretreatment was 8.29 ± 0.95 and after treatment was 5.48 ± 1.23 . The score of WOMAC scale

in the category of Pain, pre-treatment was 14.59 ± 1.5 and after treatment was 10.14 ± 2.32 . In the category of physical functions, the mean score of participants pre-treatment was 47.41 ± 4.98 and after treatment was 40.45 ± 7.8 . The total score of WOMAC scale pre-treatment was 67.73 ± 6.03 and after treatment was 54.5 ± 10.16 . The value, calculated through the paired sample t-test shows that there is a significant improvement with the treatment in all category (Tables 1-3).

In Group B, The mean score of VAS pretreatment was 7.2 ± 1.12 and after treatment was 3.8 ± 1 . The score of WOMAC scale in the category of Pain, pre-treatment was 11.41 ± 2.82 and after treatment was 6.73 ± 2.25 . In the category of stiffness, the mean score of participants pre-treatment was 3.77 ± 1.63 and after treatment was 1.86 ± 1.17 . In the category of physical functions, the mean score of participants pre-treatment was 38.95 ± 8.1 and after treatment was 26.05 ± 7.32 . The total score of WOMAC scale pre-treatment was 53.73 ± 11.1 and after treatment was 34.59 ± 10.07 . The value, calculated through the paired sample t-test show that there is a significant improvement with the treatment in all categories (Table 4).

The Improvement in VAS score in Group A was 2.81 ± 1 and in Group B was 3.4 ± 0.69 whereas improvement in WOMAC score

in Groups A was 13.23 ± 8.29 and in Group B was 19.14 ± 5.92 . P value calculated through independent sample t-test (0.02 and <0.009) show that there is a significant difference in the improvement level in both groups and improvement in Group B is significantly better than in Group A.

Discussion

The results of the present study support the hypothesis that a combination treatment approach i.e physiotherapy and intra articular injections provide subsequent benefits in relieving pain and physical disability due to knee OA. In the PT approach, different modalities e.g. TENS, ultrasound and exercise programs are used. In combination approach, above PT treatment plan with intraarticular injections (CSI) is in focus. There are two groups (Group A=PT, Group B=PT+IA) with 44 participants, included in the study. The treatment is analyzed by VAS and WOMAC questionnaire, which is given to the participants in the pretreatment and post-treatment sessions, with a period of 6-8 weeks.

In group A the pre-treatment score of pain by VAS is 8.29 ± 0.95 and for physical function by WOMAC is 67.73 ± 6.03 . The post-treatment score is 5.48 ± 1.23 and 54.59 ± 10.16 in VAS and

Table 1 Socio-demographic comparison.

Variable		Group A (PT) n=22	Group B (PT+IA) n=22	Total n=44
Gender	Male	8 (36.4%)	7 (31.8%)	15 (34.1%)
	Female	14 (63.6%)	15 (68.2%)	29 (65.9%)
Hospital	CMARTH	10 (45.5%)	3(13.6%)	13 (29.5%)
	Hameeda Memorial	5 (22.7%)	4 (18.2%)	9 (20.5%)
	kherunnisa hospital	0 (0%)	5 (22.7%)	5 (11.4%)
	LGH	0 (0%)	4 (18.2%)	4 (9.1%)
	SIMS	1(4.5%)	5 (22.7%)	6 (13.6%)
	Sir Ganga Ram	6 (27.3%)	1 (4.5%)	7 (15.9%)
Pain (VAS)	Mild	0 (0%)	0 (0%)	0 (0%)
	Moderate	6 (27.27%)	12 (54.55%)	18 (41%)
	Severe	16 (72.73%)	10 (45.45%)	26 (59%)
Disability (WOMAC)	Moderate	14 (63.64%)	19 (86.36%)	33 (75%)
	Severe	8 (36.36%)	1 (4.55%)	9 (20%)
Age		63.55 ± 7.1	60.23 ± 7.62	61.89 ± 7.47

Table 2 Group Analysis (Group A).

Group B		Pre-Treatment	Post-Treatment	p-value
Visual Analog Scale		8.29 ± 0.95	5.48 ± 1.23	<0.001
WOMAC Scale	Pain Score	14.59 ± 1.5	10.14 ± 2.32	<0.001
	Stiffness Score	5.86 ± 1.36	3.91 ± 1.44	<0.001
	Physical Function Score	47.41 ± 4.98	40.45 ± 7.8	<0.001
	WOMAC Score (in %)	67.73 ± 6.03	54.5 ± 10.16	<0.001

Table 3 Group Analysis (Group B). p-value significant at ≤ 0.05 .

Group B		Pre-Treatment	Post-Treatment	p-value
Visual Analog Scale		7.2 ± 1.12	3.8 ± 1	<0.001
WOMAC Scale	Pain Score	11.41 ± 2.82	6.73 ± 2.25	<0.001
	Stiffness Score	3.77 ± 1.63	1.86 ± 1.17	<0.001
	Physical Function Score	38.95 ± 8.1	26.05 ± 7.32	<0.001
	WOMAC Score (in %)	53.73 ± 11.1	34.59 ± 10.07	<0.001

Table 4 Between-Group Analyses. p-value significant at ≤ 0.05 .

Variable	Group A (PT) n=22	Group B (PT+IA) n=22	P-value
Improvement in VAS (Mean \pm SD)	2.81 \pm 1	3.4 \pm 0.69	0.02
Improvement in WOMAC (Mean \pm SD)	13.23 \pm 8.29	19.14 \pm 5.92	0.009

WOMAC scale. Group A participants show improvement in both VAS (for pain) and in WOMAC (for physical function) with a follow up of 6-8 weeks.

In group B the pretreatment score of pain and physical function is 7.2 \pm 1.12 and 53.73 \pm 11.1 in the VAS and WOMAC. The post-treatment score is 3.8 \pm 1 for pain and 34.59 \pm 10.07 for physical function.

The group B participants also show the significant improvement in VAS category for pain. Group B participants show marked improvement in WOMAC subscale of physical 27 functioning. In group B, the addition of intra articular gives an improvement in pain relief better than group A.

A study conducted by Henriksen, et al. [18] in the knee OA patients to assess benefits of corticosteroid injection given before exercise therapy. The result of the study shows that there was no further advantage result by adding a CSI on painful knee OA. But in my study which is conducted in Lahore, Pakistan shows the mean score of pain and physical function before treatment is 7.2 \pm 1.12 and 53.73 \pm 11. The after-treatment score is 3.8 \pm 1 for pain and 34.59 \pm 10.07 for physical function. The result reveals that treatment given by a combination of PT and CSI give better result than PT only. Another research conducted by Klokke, et al.

[19] to measure the effect of CSI given two weeks earlier to a PT program for decreasing pain status on knee OA patients. The final result of that study shows that adding intra articular does not provide additional benefits to knee OA patients. But this present study display that CSI gave with PT reveals the better outcome in knee OA patients than PT alone [20].

Conclusion

Participants in both groups showed improvement in terms of pain and disability but the improvement in Group B, which have combination treatment approach (Physiotherapy+Intra articular injections) is more as compared to improvement in Group A (Physiotherapy).

Limitations

The study had the following limitations:

The time limit was short.

Limited resources.

Recommendations

Future research is required to elaborate other synergistic combinations in conservative managements of knee OA.

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