

Physiotherapy Effect in Reducing Pain and Improving ROM in Osteoarthritis: A Case Study

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ABSTRACT

Background: Knee arthritis is a typical form that mainly affects women. The pain compels patients not to walk or to adopt the customized gait due to pain. In this clinical case study, the patient had pain there along the medial side of the thigh & knee. This pain was extended through the posterior part of the knee joint.

Purpose: This case study intends to reduce pain with the application of efficient physiotherapy interventions. For this intent, we used different physiotherapy interventions like Kinesio-taping, manual therapy and exercises to reduce pain.

Method: Subsequent to our notice of X-ray radiography in A-P and lateral view, the patient was diagnosed with knee arthritis. In this clinical case study, we used the Visual Analog Scale (VAS) to assess the severity of pain and goniometry was used to measure knee ROM in degrees. The patient took a total of 15 sessions, initially daily as the pain subsided, the number of sessions reduced in following weeks.

Conclusion: It had been seen at the end of treatment there was a significant reduction in knee pain, improvement in patient knee ROM and gait pattern.

Keywords: Pain, knee arthritis, case study, Range of Motion (ROM), Transcutaneous Electrical Nerve Stimulation (TENS), physiotherapy rehabilitation protocols

INTRODUCTION

The study conducted by Mr. Dinesh Bhatia et al states that arthritis is a progressive joint disease, is among the top five disabling states of affairs to affect more than 1/3 of the population > 65 years of age. It is natured by joint inflammation and reparative bone response.

Hinman RS et al and Heiden T et al in their study Global statistics make known that 100 million plus population globally suffer from OA and it is one of the widest spread reasons for disability. The same is our observation of our study. A clinical case of a woman of 66 years in our study is considered.

Study of Hidden T et al, Childs JD et al, Likivainio T et al also informs that arthritis of the knee is similarly affects both men and women but more commonly it affects people among younger men (<45years) and in the elder women (>45 years).

Jain S et al and Ringdahl E et al in their study make known that about 80% of persons affected by arthritis report to have some movement restriction like waking and 20% report not being able to carry out major activities of daily livelihood.

Esser S in his study details about the anatomical features of the knee articulation and explained the phenomenon that what happens in arthritis of the knee. Articular cartilage is a Smooth fibrous connective tissue is present between bones of the knee joint. The bone is covered by articular cartilage where it comes in contact with other bones, to

form joint. The cartilage works as a shock absorber as well as permits for even movement of the joint with no pain in a standard joint. On degrading of cartilage, it tends to be thinner and may even vanish in all situations which may lead to joint pain and difficulty in a movement like in knee joint.

The repetitive inflammatory reaction of the articular cartilage due to focal loss or wearing down of the articular cartilage is a character of Arthritis. The intent of our clinical case study on a 66-year-old woman is to reduce pain and achieve normal walking without pain.

CASE STUDY

Mrs. Gupta aged 66 years diagnosed with arthritis of the right

knee. She is a teacher by profession, which made her to stand for long teaching hours. She came into our clinic with A-P and lateral radiograph. Reduction of interarticular joint space was seen in the radiograph, especially between medial condyles of femur and tibia, the commencement of consumption mainly in the medial part of the bone. The patient complained of severe pain along the medial side of the thigh & knee. This pain was extended all the way through the posterior part of the knee joint. Patello-femoral crepitus while going through physical evaluation. Walking was difficult with weight shifting on the right leg.



Fig.1 A-P and lateral radiograph of the right knee showing reduction of interarticular joint space, especially between medial condyle of femur and tibia.

It had been seen in the physical assessment that the patient had leg length discrepancy. The right leg of the patient was 0.5 cm shorter than her left. Leg length discrepancy can contribute to a patient's symptoms and affect the treatment protocol. On palpation we become aware of the presence of edema around the knee, collection of adipose tissue in the medial side of the knee, weakness of the quadriceps muscle especially vastus medialis, weakness was present in ischiatic muscle and all the muscles present around the hip joint.

Kneeling, squatting, or stepping down the stairs were exacerbating her symptoms. Sitting, resting, and reclining reduce her symptoms. On being in a position for a long time, her knee became stiff. Her symptoms worsened in the humid or cold environment, and she intermittently felt as her right knee would "give out."

Physiotherapy Management

The patient took 15 sessions of physiotherapy in one month.

The protocol that was given from the first to fifth session:

The first goal of treatment was to reduce the pain:

- To reduce pain TENS (Transcutaneous Electrical Nerve Stimulation) was given for 20 minutes around the knee joint. TENS also helps in strengthening and stimulation of the quadriceps muscle especially vastus medialis muscle.
- To reduce the signs of inflammation, Laser therapy was given for 15 minutes on very first session.
- Ultrasound was given over medial and posterior surface of the knee joint, 5 minutes on each surface; it helps to reduce swelling and stiffness around the knee.
- Lymphatic drainage therapy was applied for 15 minutes to get rid of the edema around the right knee joint.
- Superior-inferior and medial-lateral glide were given to mobilize the patella.
- To strengthen quadriceps muscle, isometric exercises were given.

The protocol that was given from the fifth to tenth session:

Follow the same protocol given in the first 5 sessions along

with:

- Isotonic exercises of the muscles around the knee joint were added.
- Gait training was given with progressively increasing difficulty for the patient like diagonal walking, walking with obstacles, military walk, walking on a straight line, walking on uneven ground, etc.
- Simple exercises like weight shifting, single-leg standing were given to improve the proprioception of the knee joint.
- Kinesio-taping was applied to eradicate the patient's pain while walking.



Fig. 2 Picture showing pattern of Kinesio-tapping on left knee same pattern of tapping done on Mrs .Gupta's right knee, which was applied to improve the knee joint stability, ROM, gait pattern and overall functions.

The protocol that was given from the tenth to the fifteenth session:

- Increase the intensity of the exercises given in previous sessions.
- Up and down the stairs were added to put stress on proprioceptors and to improve patient gait pattern.
- We increase the intensity of proprioceptive exercises by adding more difficult tasks like the single-leg squat, Cone pick-ups, Crossover walk, etc.
- Reeducation of walking was even more difficult with closed eyes.
- At the end of the session, Kinesio-taping was applied to improve the knee joint stability, ROM, gait pattern and overall functions.

Results

We can observe that there was a measurable reduction in pain in the first 5 sessions where VAS=6. Whilst in the second 5 sessions VAS=4 and third 5 sessions VAS =1 in the first figure. Keeping the pain scale as 10 for before the treatment, with the application of physiotherapy management we detect that the pain reduced and eliminated in the last 5 sittings.

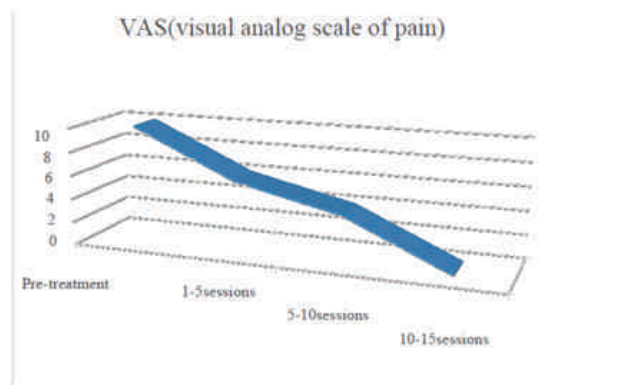


Fig. 3 showing VAS of the patient, pre-treatment VAS=10, after the initial 5 Sessions VAS=6, after the second 5 sessions VAS=4 and after the last 5 sessions VAS=1.

It's visible there was an increase in knee flexion ROM as pain eradicates with physiotherapy in the second figure. More

importantly in the last five sessions, the patient regains the maximum degree of ROM of the knee joint in flexion.

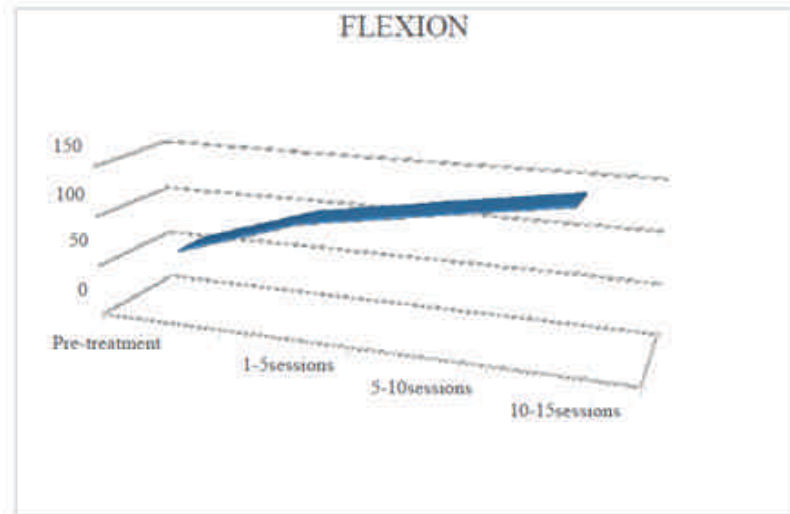


Fig.4 showing flexion ROM of the right knee joint of patient pre-treatment, after the initial 5 sessions, after the second 5 sessions, and after the last 5 sessions.

We can see there was an increase in knee extension ROM as pain eradicates with physiotherapy in the third Figure, where yet again in the last five sessions the patient achieved knee

extension ROM, not though optimal but was sufficient considering the patients age.

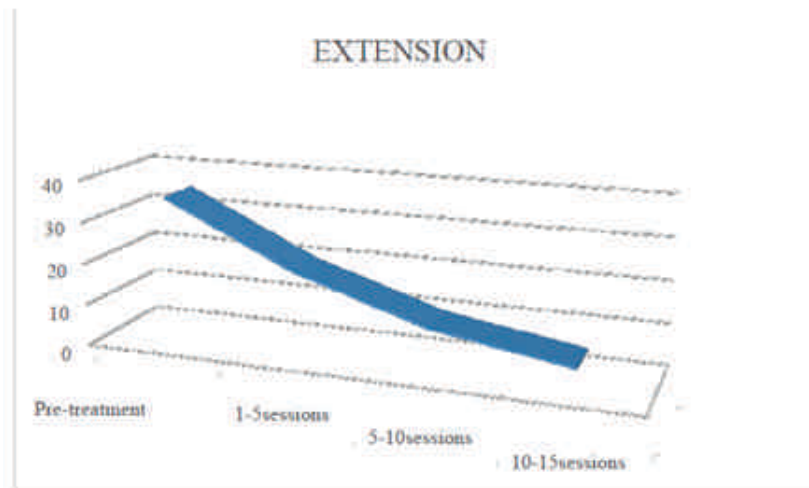


Fig.5 showing extension ROM of the right knee joint of patient pre-treatment, after the initial 5 sessions, after the second 5 sessions, and after the last 5 session

CONCLUSION

From the result, we can conclude that the application of physiotherapy is effective in relieving pain and improving gait of the subjects in the majority of the cases affected with osteoarthritis. The subject in the present clinical case study had severe pain in the right knee that made her walking difficult. At the end of the study revealed that physiotherapy is very helpful in eliminating pain and improving gait in arthritis.

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