

Concoction Effect of Advance Physiotherapy Intervention on Clinical Parameters in Osteoarthritis Knee Patients - A Case Report

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Abstract: *Osteoarthritis is most common degenerative conditions, affecting 65 years of age and older. The main goal of osteoarthritis treatment in physiotherapy is to reduce pain, improve physical function, prevent disability, and enhance quality of life. Considering advances in Physiotherapy for osteoarthritis knee patients, this study aims to evaluate the concoction effect of advanced physiotherapy intervention as a cumulative approach on clinical parameters of osteoarthritis. Various parameters were assessed using different scales including the Numerical pain rating scale for pain, knee injury, and osteoarthritis outcome score and Western Ontario and McMaster University arthritis index for disability, while the functioning of the lower limb was assessed using the lower extremity functional index. Pre-treatment and post-treatment scores were evaluated with follow-up for six weeks. The present research concludes effect of advanced physiotherapy intervention has a significant effect on clinical parameters. It has shown improvement in the strength of lower limb muscles with improved physical functioning and reduction in pain and disability caused by OA knee secondary to concoction advance physiotherapy treatment which directly improves the patient's quality of life in OA knee and provides a holistic approach for improvement towards condition.*

Keywords: Osteoarthritis knee, Recent advances, Physiotherapy, Clinical Parameters

1. Introduction

Osteoarthritis (OA) is one of the most common degenerative conditions, affecting 65 years of age and older. Globally, the cumulative incidence of knee OA was 22.9% in adults over 40 and 16% in those over 15 years of age.(1) The most prevalent type of arthritis that impairs quality of life, creates disability and raises the risk of falls is osteoarthritis of the knee. Knee OA is characterized by several symptoms, such as pain, stiffness, weakness in the knee muscles, compromised joint integrity, imbalance, and restricted range of motion in the knee. (2) The initial line of treatment for osteoarthritis in the knee is typically conservative management, which aims to prevent or postpone the necessity for surgery. It's still neglected, though, and different global standards may provide rather differing suggestions for various conservative management strategies. (3) Increasing muscle strength is a useful tactic for people with knee OA to slow down the loss of proprioception. Illness, atrophy, or weakening can also cause decreased muscle spindle sensitivity. Neuromuscular electrical stimulation improves functionality by strengthening muscles and reducing joint stiffness. Peroneal nerve stimulation is thought to avoid autogenic muscle inhibition and lessen muscular atrophy by limiting the passage of inhibitory impulses to the alpha motor neurons in the quadriceps.(4) To lessen discomfort and inflammation associated with osteoarthritis in the knees, the researchers in the earlier trial used laser therapy for three weeks before starting any physical activity(5). Extensor muscle weakness and atrophy are common in patients with osteoarthritis, and these symptoms have been related to a decline in functional ability and a worse quality of life (QOL) for the affected

individuals. Enrolling patients with knee OA in manageable exercise regimens is essential to prevent this. (6) Researchers found that, in clinical practice, limb swing and quadriceps muscle strengthening exercises are safer and more cost-effective than other exercise regimens for patients with knee joint osteoarthritis. These regimens can also help patients improve their condition, reduce pain, and slow down the degeneration of their knee cartilage. (7).

For three weeks, adding backward walking exercises to a standard treatment program helped people with knee OA function better and experience less disability due to stronger quadriceps muscles.(8) Osteoarthritis (OA) is a complex, multi-factorial, chronic rheumatic disease that makes it difficult to carry out daily tasks. Psychosocial factors also play a role in OA, as they can prolong activity, exacerbate pain, and affect how well a treatment works. Knee OA is known to cause pain and physical disability, but it can also cause pain catastrophizing, low self-efficacy, and kinesiophobia (9) Considering advances in Physiotherapy in OA knee patients, this study aims to evaluate the combined effect of all the advanced physiotherapy interventions as a cumulative intervention on the clinical parameters of OA knee patients.

Patient Information

The patient is a 46-year-old female; she has been having pain in her bilateral knee for the past 6 months which was progressive because of which she was having difficulty in her occupational and domestic work. The knee ranges were complete but painful at the end range, while the lower limb strength was a fair plus. For the past 2 months, she has been

experiencing difficulty in teaching work due to long-standing and repeated stair climbing as she is a teacher for which she visited the local doctor and was referred to take physiotherapy treatment.

The patient was having pain in the bilateral knee region with the intensity of seven on ten numerical pain rating scale on activity while two on ten on rest. Tenderness on her medial aspect of the bilateral knee region and also spasms in her calf muscles, the strength of her knee flexors and extensors was fair while the strength of her hip and ankle muscles was good. A gait examination of the patient revealed that she was having a limping gait due to pain in her bilateral knees.

Diagnostic: X-ray was done to diagnose, which revealed definite osteophytes and a definite narrowing of joint space. It revealed grade two osteoarthritis of the knee using the Kellgren Lawrence grading scale.

Therapeutic Intervention:

The intervention included were Thermotherapy for 10 minutes,

Straight leg raise in supine (half kilogram weight cuff with 15 repetitions),

Clamshell exercise (10) with thera band (5-sec hold with 10 repetitions),

Otago exercises (11) (ten repetitions),

activities were included (With ½ kg to 1kg of weight) Active hip extension, Active hip abduction, Active knee flexion, Heel and Toe walking, Figure of eight walking, Tai chi exercise in standing including ten repetitions with two sets of three different exercises, Single leg stand with knee flexed of stance leg followed by weight shifting on another limb in anterior direction, Single leg stand with knee flexed of stance leg followed by weight shifting on another limb in anterior-medial and anterior-lateral direction, Single leg stand with knee flexed of stance leg followed by weight shifting on another limb in sideway direction.

Pilates (12) in supine lying for knee

First week- Spine stretch or Spine twist

Second week - 1st WEEK and Side leg lift with Leg circles in supine

Third week- 2nd week and Pelvic curl,

Fourth week- 3rd week and one leg kick

Fifth week- 4th week and double leg kick

Sixth Week- 5th week and one leg stretch + Swimming

Peroneal nerve Stimulation (13) (fifteen minutes) with laser therapy on alternate basis,

Proprioceptive neuromuscular stretching of hamstring (14) 30 sec hold × 3 repetitions

- Leg swings in standing (10 repetitions with three sets)

- Pain neuroscience education (15) (one session per week for 4 weeks)

Backward walking on treadmill for 15 minutes

Follow Up and Outcome Measure:

Follow up was taken after 6 weeks of protocol which included the therapeutic intervention mentioned above including the advance physiotherapy intervention with the basic conservation treatment protocol followed in OA knee patients. The questionnaires were used to take the pre and post reading of pain, function and disability.

Clinical Finding

2. Discussion

The current study aimed to evaluate combined effect of advance physiotherapy intervention on clinical parameters in Osteoarthritis knee patients which concluded that, the advance physiotherapy in addition to the basic conservation treatment protocol followed in OA knee has a significant improvement resulting in reduction in pain and disability while improving the functioning of an individual with OA knee. Various parameters were taken into consideration such as pain, stiffness, physical function, recreation function, ADL'S and quality of life in OA knee patient. To assess this factors various scales were used. To assess pain Numerical Pain Rating scale (NPRS) was used which showed significant reduction in pain when compared to pre and post treatment session after 6 weeks as shown in the (Table: 1 clinical Parameter) While the other parameters that is ADL recreational activity and quality of life were assessed using KOOS which showed reduction in scores when taken pre and post indicating improvement in parameters of patients with OA knee. (demonstrated graphically in the figure:1) While the disability caused due to OA was assessed using WOMAC by comparing pre and post treatment score, there was significant difference in score which showed reduction in disability caused due to OA knee. The function of lower limb was assessed using LEFS which showed improvement in function when compared pre and post score after 6 weeks of treatment protocol. This study concluded that a cumulative advance physiotherapy intervention has a significant improvement on various parameters of OA knee which can follow as a regular for OA Knee patients. The advance intervention targeted the strength of prime muscles of lower limb that is Quadriceps and flexibility of hamstring as a scope for better outcome in OA knee. (16) The intervention including Peroneal nerve Stimulation with neuromuscular nerve stimulation prevent atrophy and helps in improving functioning, while laser session for 4 week has also showed significant reduction in pain and helps in healing. Other intervention such a backward walking with leg swings and quadriceps strengthening has shown improvement in lower limbs function and decrease disability. (17) Apart from this Tai chi exercise has shown a great improvement in function by enhancing the healing and improving the strength, proprioception and balance. Additional to it, emphasize on pain education in order to prove a holistic approach by considering psychological, social factors of an individual in pain helps in preventing disability and improve quality of life of an individual with OA knee. Therefore considering the significant effect of all the intervention, it can be used as cumulative approach in managing the patients with OA knee.

3. Conclusion

Current research concluded that the concoction effect of advance physiotherapy intervention has a significant effect on clinical parameters such as pain, stiffness, physical activity, recreational function, activities of daily life and quality of life in Osteoarthritis knee patients. It has shown

significant improvement in strength of lower limb muscles with improved physical functioning and reduction in pain and disability caused due to osteoarthritis knee secondary to advance physiotherapy treatment which directly improve the patient’s quality of life in OA knee and provide a holistic approach for improvement towards condition.

4. Figures and Tables

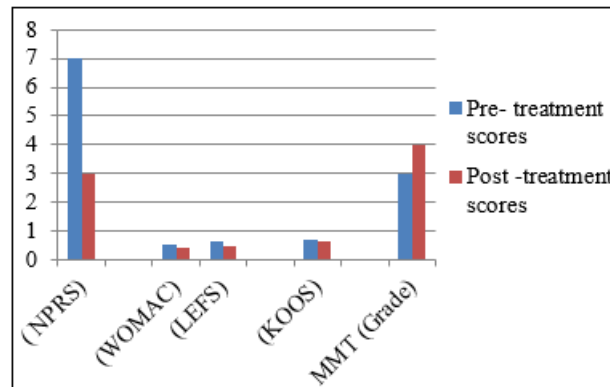


Figure 1: Concoction effect of advanced physiotherapy on clinical parameter

Tables

Table 1: Clinical Parameter

Outcome measures	Pre-treatment scores	Post-treatment scores
Numerical Pain Rating Scale (NPRS)	7/10 at activity 2/10 at rest	3/10 at activity 0/10 at rest
Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)	54%	40%
Lower Extremity Functional Scale (LEFS)	66%	49%
Knee Injury and Osteoarthritis Outcome Score (KOOS)	68%	61%
Lower Extremity Strength on Manual Muscle testing	Grade 3	Grade 4

5. Other recommendations

Future research will be considered with larger sample size and the concoction effect of advance physiotherapy intervention will be help to accelerate in the osteoarthritis patient’s rehabilitation, services, and recovery

Future scope:

Informed Consent: Informed written consent was prior obtained from the patient for enrolling in the current research.

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Conflict of Interest: No any conflict of interest

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