PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION - AN INNOVATIVE APPROACH TO TREAT OSTEOARTHRITIS KNEE PATIENTS.

ABSTRACT

Aim: Osteoarthritis (OA) knee is one of the major cause of mobility impairment, particularly among people of age group 40 years and above. Though there are many treatments available for OA both pharmacological and non-pharmacological, explore of PNF technique in OA knee is still in lacunae. To fillip the gap, this study is to find out the immediate effect of Proprioceptive Neuromuscular Facilitation (PNF) stretching in osteoarthritis knee patients.

Methods: A prospective study was conducted at National Institute of Medical Science Superspeciality Hospital, Jaipur. This study included 100 patients and they were divided into Group A (n=50), which was control group and Group B (n=50) was experimental group. Group A and B underwent out come measuring tools like pain measured using Numeric Pain Rating Scale (NPRS), Range of Motion (ROM) of knee joint measured using Universal goniometer and Functional activities of knee joint measured using short form Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) before and after treatment. Group A patients received Moist Hot Pack (MHP) in knee joint for 5 minutes, where as Group B patients received MHP for 5 minutes and PNF stretching (Contract Relax - Antagonist Contract) for 3 minutes.

Conclusion: It was concluded from the study that PNF stretching may be a treatment option for patients with OA knee.

KEYWORDS

PNF, Proprioceptors, Osteoarthritis.

INTRODUCTION

Osteoarthritis (OA) knee is one of the major cause of mobility impairment, particularly among people of age group 40 years and above. Prevalence of Osteoarthritis knee in India is 28.7%. Due to improvement of human life expectancy prevalence of OA is going to increase in future. Osteoarthritis of knee causes pain and disability which adversely affects life style and quality of life of patients.

 There are plethora of treatment options available to clinicians for OA but there is still scope for treatments which improves symptoms with minimal or negligible side effects. OA treatment can be broadly classified into pharmacological and non-pharmacological treatment. Pharmacological treatment includes acetaminophen, Non steroidal anti inflammatory drugs (NSAIDs), Opioids, Intra articular injections, Glucosamine sulfate and chondroitin sulfate. Non pharmacological treatment includes hydrotherapy, massage therapy, thermotherapy, electrotherapy, Manual therapy and surgery. These days pharmacological interventions plays major role in the treatment of Osteoarthritis knees. Pharmacological interventions do improve symptoms but they are not benign and does have side effects and also required to be taken for long duration. Non-pharmacological intervention like Proprioceptive Neuromuscular Facilitation (PNF) stretching is safe and can improve symptoms in OA knees with negligible side effects. There has been little research on PNF in treatment of OA knees. Considering the above, this study was aimed to explore the immediate effects of PNF stretching in terms of pain, range of motion and functional activities in osteoarthritis knee patients.

SUBJECTS AND METHODS

A prospective study was conducted after getting ethical committee approval from period of July 2017 to December 2017 at National Institute of Medical Science Superspeciality Hospital, Jaipur. This study included 100 patients. Inclusion criteria was patients with age group 40 years and above with Grade 1 or Grade 2 osteoarthritis of knee joint on radiographs according to criteria of Kellgren and Lawrence. Patients of Grade 3 and 4 osteoarthritis of knee joint and with history of major Knee injury, Neuromuscular disorder of the knee joint, Inflammatory arthritis, history of steroid injection in knee joint and any congenital disorder or previous trauma were excluded from the study.

After explaining the procedure and getting consent, 100 patients were enrolled in the study and were divided into Group A and B by lottery method. Group A (n=50) control group and Group B (n=50) was experimental group. Group A and B underwent out come measuring tools like pain measured using Numeric Pain Rating Scale (NPRS), Range of Motion (ROM) of knee joint measured using Universal goniometer and Functional activities of knee joint measured using short form Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) before and after treatment. Group A patients received Moist Hot Pack (MHP) in knee joint for 5 minutes, where as Group B patients received MHP for 5 minutes and PNF stretching (Contract Relax - Antagonist Contract) for 3 minutes.

RESULTS

PNF, Proprioceptors, Osteoarthritis.
In Group A (Control group) patients age of range 42-65 years , average score for Pre and Post NPRS score was 5.64 and 5.32 .Pre and Post ROM average score was 117 and 118.2 and Pre and post Short form WOMAC score was 16.1 and 15.38. P value of NPRS, ROM and Short form WOMAC score was 0.10, 0.46 and 0.19 respectively. In Group B (Experimental group) patients age of range 42-65 years , average score for Pre and Post NPRS score was 5.66 and 4.16. Pre and Post ROM average score was 117 and 123.6 and Pre and post Short form WOMAC score was 15.76 and 12.9. P value of NPRS, ROM and Short form WOMAC score was < 0.0005. On comparing the average and P value of Pre and Test scores in both Control and Experimental groups it was noted that Group A had negligible effects in OA knee patients with respect to Pain, ROM and Functional activity. Where as Group B patient respond well to PNF stretching treatment and results were highly significantly statistically (P <0.0005). None of our patients in both control and experimental group reported any local skin or general complications with the treatment.

DISCUSSION

There are various treatment options available to treat OA, where people has options to choose one among it. They are aware of pharmacological treatment which yields only symptomatic relief, relief also dosage dependent, long duration treatment and not cost effective. Clinicians are looking for alternate treatment options which is safe, effective and has minimal side effects. Among various non- pharmacological treatment following are most commonly utilized methods. Thermotherapy, where heat, cold and combination of two (contract bath) are used, which yielded negligible effects in OA knee patients’. Exercise is utilized as supportive treatment in OA knee patients. Exercise can course some symptomatic improvement but it can't alter biomechanical nor structural disease progression in Osteoarthritis knee patients. The effect of exercise also declines over time. Electrical modalities like Transcutaneous Electrical Nerve Stimulation (TENS), Interferential current (IFT), Ultrasound therapy and Short wave diathermy showed improvement in OA symptoms but for short terms, but it is not cost effective. Hydrotherapy improves symptoms of Osteoarthritis, but muscle cramps, fall and contact dermatitis were noticed with this modality. Massage therapy which in an conventional method to treat OA is time consuming procedure and yielded negligible effects.

Due to adverse, negligible effects and burden of cost of treatments mentioned above, there evolved new innovative treatment for Osteoarthritis which can ease symptoms without major side effects. Using the body's own biological mechanism i.e stimulation of mechanoreceptors in muscle may relieves pain, increase Active Range of Motion (AROM) and functional activities of Osteoarthritis knee patients. Mechanical forces which evoke response from Mechanoreceptors are present in muscle. PNF stretching technique is one of the technique used to stimulate the muscle receptors. PNF stretching is technique used to treat tightness, intermuscular contracture around the joint not in arthritis of joint. Findings of previous empirical evidence which applied PNF stretching to shortened hamstring muscle noted increased muscle flexibility. Similarly modified hold relax technique produced better hamstring flexibility in tight hamstring muscle. So it created a lacunae to focus on availing the PNF stretching in Osteoarthritis knee. In OA knee, patients have symptoms like pain, Restricted ROM and difficulty in functional activities like walking, stair climbing, squatting etc. So once the pain gets better, patients become functionally active. To ease pain muscle receptors (Mechanoreceptors) was stimulated with PNF stretching (Pain gate theory). In this study it was observed that PNF stretching when applied to osteoarthritis knee patients of grade 1 and 2 yielded marked reduction in pain, increased ROM and functional activities. Our study was limited by its short follow and we only saw the results of PNF immediately after the treatment. We believe that if repeats sessions of PNF then it would lead to improvement in patients symptoms for longer term and we recommend a study with longer follow up is required to see if this true.

CONCLUSION

Moist hot pack treatment on its own has negligible effects in improving symptoms of OA knee patients. PNF showed significant beneficial effects in patients with early arthritis. It showed improvement in pain, range of motion and improvement in WOMAC score. PNF stretching seems to be a good alternative treatment option for OA patients without significant side effects. Authors would recommend that patients with early knee arthritis should be routinely sent for PNF treatment.

REFERENCES

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