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"EFFECT OF DRY NEEDLING WITH MYOFASCIAL RELEASE ON PAIN, TIGHTNESS AND ADLs AMONGST IT PROFESSIONALS WITH PIRIFORMIS SYNDROME -A RANDOMIZED CLINICAL TRIAL."

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BACKGROUND:

Piriformis Syndrome (PS) is a neuromuscular condition that often leads to pain and functional limitations, particularly in individuals with sedentary occupations like IT professionals. The high prevalence of PS in this group (68%) and its impact on daily activities highlights the need for effective therapeutic interventions. This study aims to evaluate the effects of **Dry Needling (DN)** combined with **Myofascial Release (MR)** on pain, hip tightness, and activities of daily living (ADLs) among IT professionals with PS.

AIM: The aim of this study is to find the EFFECT OF DRY NEEDLING WITH MYOFASCIAL RELEASE ON PAIN, TIGHTNESS & ADLS AMONGST IT PROFESSIONALS WITH PIRIFORMIS SYNDROME.

METHODOLOGY: A randomized clinical trial was conducted with 30 IT professionals (aged 22-45) diagnosed with PS, using purposive sampling. Participants were divided into two groups, and treated for two weeks with DN and MR techniques. Pain was measured using the **Visual Rating Scale (VRS)**, hip tightness was assessed with the **FABER test**, and functional disability was evaluated using the **Oswestry Disability Index (ODI)**. Pre- and post-treatment scores were compared to assess the effectiveness of the intervention.

RESULTS: Significant improvements were observed in all outcome measures. Pain levels, as assessed by the VRS, decreased from a mean of 2.0 to 0.2. Hip tightness, measured by the FABER test, showed reduced discomfort and improved mobility. The Oswestry Disability Index revealed a decrease in disability from 0.6 to 0.1, indicating substantial improvements in daily functioning.

CONCLUSION: The combination of **Dry Needling and Myofascial Release** is effective in reducing pain, improving hip mobility, and restoring functional abilities in IT professionals with piriformis syndrome. This study suggests that these non-invasive techniques offer a promising treatment for managing PS in sedentary professionals. Further research with larger sample sizes and longer follow-up is recommended to validate these findings and assess the long-term effects of the intervention.

KEYWORDS: Piriformis Syndrome, Dry Needling, Myofascial Release, Pain, Hip Tightness, Oswestry Disability Index, IT Professionals.

INTRODUCTION

PIRIFORMIS SYNDROME is a neuromuscular condition characterized by prolonged or excessive contraction of the piriformis muscle or by sciatic nerve entrapment in the piriformis region. [3] .The age range of 19–75 years, with a 43-year-old mean, were identified as having piriformis syndrome clinically. The piriformis syndrome prevalence was 6.25%. [2] Patients with low back discomfort have reported incidence rates of Piriformis Syndrome ranging from 5% to 36% .[1] .Prevalence of piriformis syndrome in IT professionals is 68 %. [6] .Office workers and other sedentary professions occasionally develop musculoskeletal discomfort. [6] .All professional fields are seeing an increase in the use of computers, particularly among IT specialists who spend a lot of time in front of a screen. [6]Extended periods of sitting can influence the other hip muscles, weaken them, and eventually result in low back discomfort. It can also cause piriformis muscle tension and piriformis syndrome. [6]Myofascial trigger points may develop in response to altered muscle demands resulting from piriformis muscle spasm, which is thought to be one of the most common causes of PS. [3]Women are more likely than men to suffer from Piriformis Syndrome, which may be related to the biomechanics of their wider quadriceps femoris muscle angle, or "Q angle," in the os coxae (pelvis).[1]

There has been a history of recent trauma, as well as modifications to training or lifestyle choices. [2]There have been reports of external rotation of the hip and soreness in the piriformis muscle when external palpation is performed across the larger sciatic nerve as indicators of piriformis syndrome. [2]Low back/buttock discomfort with pain radiating down the back of the leg might imply piriformis syndrome as part of the differential diagnosis. Piriformis syndrome is one of several illnesses that can cause low back/buttock pain with sciatica. [2]Physiotherapy, analgesic and nonsteroidal anti-inflammatory drug administration, trans rectal massage, transvaginal ultrasound wave application, and local aesthetic and corticosteroid injection are examples of non-operative therapeutic methods. [2]Sectioning the piriformis muscle at its tendinous attachments, releasing

fibrous bands or squeezing arteries, and external neurolysis comprise the operational treatment. Since the hip contains additional short external rotators, there is only a minor functional loss following the sectioning of the piriformis muscle. [2]Myofascial trigger points in various muscle areas are deactivated by dry needling with minimum invasion, which also helps to reduce local discomfort. [3]Physical fascial tissue manipulation is used in myofascial release. Chronic pain is caused by facial strain, which puts pressure on muscles and nerves. This method assisted in restoring joint range of motion, addressing muscle imbalances, relieving discomfort in the muscles, and preserving normal muscle strength. [4].

The aim of the study is the effect of dry needling with myofascial release on pain, tightness & ADLs amongst IT professionals with piriformis syndrome**.**

The objective of the study is the effect of dry needling with myofascial release on pain using VRS scale, tightness using FABER test, ADLs using Oswestry disability index (ODI).

In the present era, the lifestyle and postural demands of every professional has increased and has led to severe postural and muscular pathologies. The IT Professionals are bound to have a sedentary posture due to their work demands. This has implicated in various deformities and muscle pain. The prevalence of Piriformis syndrome in IT professionals is 68% which is alarming and a concern. There have been various interventions and treatment methods but there is scarcity of literature which explains immediate relief. Hence this study aims to benefit the subjects with the use of Dry needling and Myofascial release.

METHODOLOGY & MATERIALS AND EQUIPMENT

This experimental study, using purposive sampling and a randomized clinical study design, will be conducted over 6 months with a sample size of 30 IT professionals from IT companies in Sangli & Miraj city.

The materials required for the study include a data collection sheet, consent form, plinth, and needles.

The procedure involved obtaining ethical committee clearance and screening participants according to the inclusion and exclusion criteria, followed by explaining the study procedure to all subjects and obtaining written consent before and after treatment; both the VRS scale and Faber test were measured, with subjects divided into one group and receiving an intervention for 5 minutes per session, 2 sessions per week, over 2 consecutive weeks, with pre- and post-interventional statistical analysis performed to assess the results.

The inclusion criteria for the study are: participants aged 22 to 45 years, employed for at least one year with a minimum of 5 hours of work daily, both men and women, a positive Faber test, gluteal pain radiating through the back and lower limb of the thigh, increasing pain below 60 degrees in SLR, and a diagnosis of sub-acute or chronic compression of the sciatic nerves. The exclusion criteria include: intermittent vascular claudication, spondylolisthesis, a history of vertebral fracture, significant lower back injury within the last six weeks, history of spinal surgery, spinal tuberculosis or rheumatoid disease, a history of hamstring tear within the previous six weeks, MRI evidence of a hamstring tear, clinical evidence of radiculopathy or neurological impairment, needle phobia, bleeding disorders, use of anticoagulant medication, previous

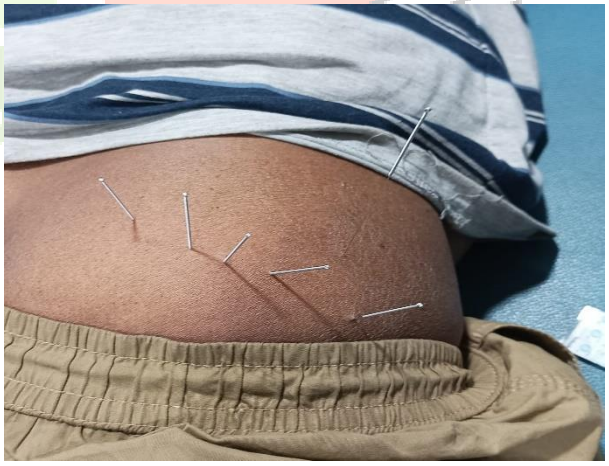
experience with dry needling for myofascial pain, or inability to reproduce symptoms with trigger point palpation.

OUTCOME MEASURES: VRS SCALE: (Verbal Rating Scale), FABER TEST, OSWESTRY DISABILITY INDEX:

PROTOCOL

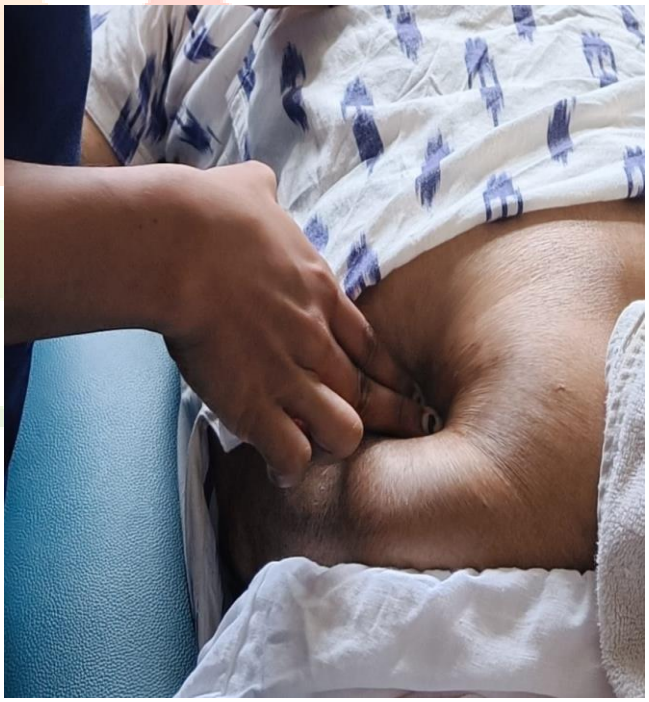
DRY NEEDLING TREATMENT

- Tight points or taut band were identified by palpation.
- The patient lay on the abdomen.
- The examiner found the landmarks of greater trochanter and sacrum in S2, S3 and S4 and he inserted the needle vertically to the surface of the trochanter, from the sciatic notch towards the pubis symphysis, directly to the stiffness points.
- Dry needling was performed deeply by a needle with the 0.30 mm in diameters and 65mm in length.
- The needle is inserted deep enough to fully penetrate the taut band region & then pulled back to subcutaneous tissue layer, but not out of the skin (fast in & fat out technique) & repeated several times then the needle is left in the TrP for 7 to 10 min.
- Intervention to be given for 10 min/session, 2 sessions/week for 2 consecutive weeks.



MYOFASCIAL RELEASE TECHNIQUE

- The therapist instructs the patient to be in a prone lying position.
- The therapist stands at the affected side of the pain. Adjust the height of the bed according to the preference of the therapist.
- Perform myofascial release, using the therapist's palm directly on the piriformis muscle, press on the trigger point directly and hold for a while (10 to 100 seconds).
- Apply small kneading strokes back and forth following the direction of the muscle fibres.
- Stroke parallel to the fibre to elongate them, because that might be more effective.
- Perform this for five minutes at least and continue for 3 sets of five minutes each.
- The patients received 2 sessions per week for 2 weeks.



STATISTICAL ANALYSIS

- The normality testing of data was done by Paired t-test.
- The descriptive statistics revealed that the mean age of participants was 34.1 years, with a standard deviation of 5.8, ranging from 24 to 44 years. The pre-treatment Visual Rating Scale (VRS) score had a mean of 2.0 (SD = 0.5), while the post-treatment score decreased to a mean of 0.2 (SD = 0.5), with scores ranging from 0.0 to 2.0. For the Oswestry Disability Index (ODI), the pre-treatment mean was 0.6 (SD = 0.0), and the post-treatment mean reduced to 0.1 (SD = 0.1), with values ranging from 0.0 to 0.4.

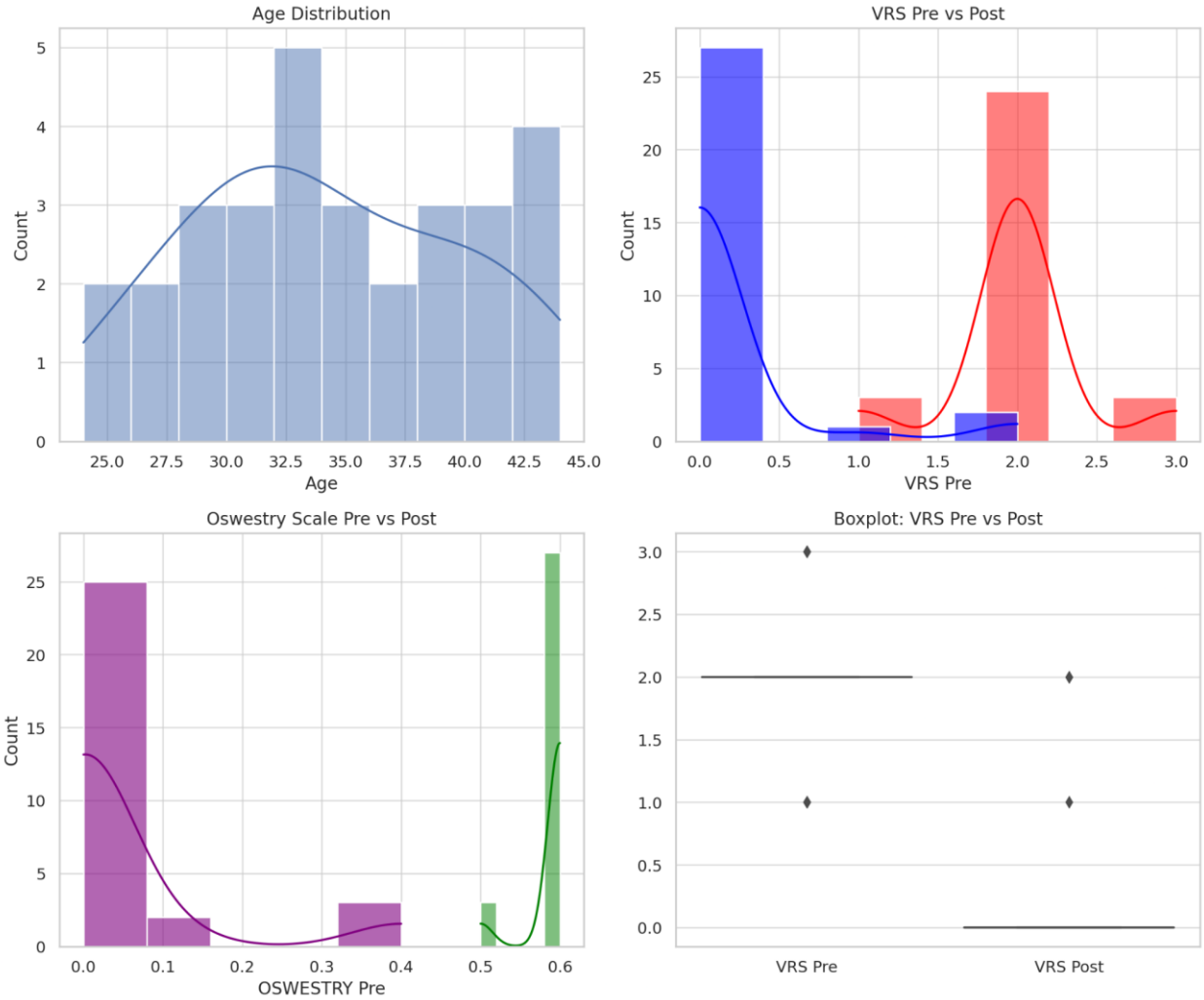
- The statistical analysis showed a significant reduction in both pain and disability, with a test statistic of 26.5 and a p-value of 0.0 for the VRS, indicating a significant decrease in pain levels. Similarly, the Oswestry pre- and post-treatment comparison showed a significant reduction in disability, with a test statistic of 24.3 and a p-value of 0.0.

RESULT

This document summarizes the statistical analysis performed on the dataset. The analysis includes:

- Distribution plots of variables
- Data overview
- Distribution analysis
- Descriptive statistics
- Statistical test results.

1. Distribution plots of variables



2. Data Overview

The dataset consists of medical test results for 30 individuals, including:

- Age: Ranges from 24 to 44 years.
- Gender: 15 Males, 15 Females.
- VRS (Visual Rating Scale): Pain levels before and after treatment.
- FABER Test: Positive or negative results before and after treatment.
- Oswestry Scale: Disability scores before and after treatment.

3. Distribution Analysis

- Age: Mostly distributed between 30-40 years.
- VRS Pre vs Post: Significant decrease in pain levels post-treatment.
- Oswestry Pre vs Post: Major reduction in disability scores.
- FABER Test: Initially, all results were positive; post-treatment, most became negative.

4. Descriptive Statistics

Variable	Mean	Std Dev	Min	Max
Age	34.1	5.8	24.0	44.0
VRS Pre	2.0	0.5	1.0	3.0
VRS Post	0.2	0.5	0.0	2.0
Oswestry Pre	0.6	0.0	0.5	0.6
Oswestry Post	0.1	0.1	0.0	0.4

5. Statistical Test Results

Test	Statistic	p-value	Conclusion
VRS Pre vs Post	26.5	0.0	Significant reduction in pain.
Oswestry Pre vs Post	24.3	0.0	Significant reduction in disability.

- These results strongly support the efficacy of the treatment in alleviating pain and improving mobility.

DISCUSSION

From a neurophysiological standpoint, DN may stimulate A-delta nerve fibres, which may then activate the enkephalinergic inhibitory dorsal horn interneurons, leading to opioid-mediated pain suppression and pain relief. Researchers have attributed the therapeutic effects of DN to a variety of mechanisms, including mechanical, neurophysiologic, and chemical effects. It is believed that DN provides a mechanical localized stretch to the shortened sarcomeres and contracted cytoskeletal structures within the TrP, allowing the sarcomere to return to its resting length by minimizing the degree of overlap between actin and myosin filaments. Studies on the chemical action of DN have shown that triggering LTR after DN 28 directly corrects the elevated levels of bradykinin, CGRP, substance P, and other substances at TrP.

DN could have an impact on the microcirculation. Numerous researchers have shown that inserting a needle into the muscles enhanced blood flow to the stimulated area of the skin and muscles.

Local ischemia at the trigger point site and the development of myofascial trigger points are mostly caused by shortened sarcomeres. The shorter sarcomeres will therefore lengthen and flatten with the application of ischemia compression and stretching. When the pressure is released from the trigger point, this temporary stretch induces a flush of blood at the compression site and lessens the overlap between actin and myosin. By increasing local circulation and so reducing the release of unpleasant compounds, this helps to block the activity of trigger points and lessen the sensitivity of Points of myofascial tension. Therefore, this study shows positive results in decreasing pain & tightness post intervention.

Hence this study reveals that DN and Myofascial release shows greater improvement in pain, tightness & ADLs among IT Professionals with piriformis syndrome.

CONCLUSION

This study concluded that **Dry Needling combined with Myofascial Release** is an effective therapeutic intervention for **Piriformis Syndrome** in IT professionals. The significant reduction in pain, improvement in hip tightness, and better functional outcomes suggest that this combined approach can effectively address the symptoms of PS. Given the high prevalence of piriformis syndrome in sedentary workers, such as IT professionals, this treatment could have broader implications for occupational health, offering an efficient option for managing musculoskeletal disorders related to prolonged sitting and poor posture.

FUTURE SCOPE

The future scope of research into the effects of dry needling and myofascial release on IT professionals with piriformis syndrome should aim to further explore how these therapies can impact hip and pelvic biomechanics, posture, and functional performance.

- **Hip Joint Mobility:** IT professionals typically experience reduced hip mobility due to prolonged sitting, contributing to muscular imbalances. Future studies could explore how dry needling and MFR techniques can improve hip flexion, extension, and internal/external rotation range of motion by targeting the piriformis and surrounding muscle groups (e.g., gluteal muscles, iliopsoas, and hamstrings).

- **Pelvic Alignment:** Both DN and MFR are known to affect muscle tone and tissue elasticity. Research could assess their influence on pelvic tilt (anterior/posterior) and how this correlates with improved biomechanical function. For instance, pelvic misalignment often exacerbates pain and discomfort in piriformis syndrome, and these interventions may offer realignment benefits by reducing muscular tightness and improving joint mobility.

- **Spinal Posture and Core Engagement:** Long periods of sitting lead to poor postural habits, including slouching or pelvic dysfunction. The effect of MFR and DN on improving posture could be studied by assessing changes in thoracic and lumbar spine alignment, as well as the involvement of core stabilizers. By relieving tightness in the piriformis, glutes, and lower back muscles, these interventions might indirectly encourage better postural support.

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