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Effectiveness Of Muscle Energy Technique And Maitland Mobilization Technique Along With Ultrasound In Patients With Postpartum Coccydynia - A Comparative Study.

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ABSTRACT

INTRODUCTION: Coccydynia is a medical term, which means the disorder of tailbone pain without any significant radiation or associated low back pain. Women are 5 times more likely to develop coccydynia.

AIM OF STUDY: To evaluate the efficacy of Muscle Energy Technique and Maitland Mobilization along with ultrasound in reducing pain and improving functional activities in patient with postpartum coccydynia

MATERIALS AND METHODOLOGY: After fulfilling the selection criteria,30 subjects were randomly allotted in MET along with US Group A and MM along with US Group B each group consists of 15 subjects. Each group is treated for 3 days per week for 6 weeks of duration. The outcome measure is NPRS and ODI

RESULT: The mean value of NPRS in group A (3.333) is more than the NPRS in group B

(4.200) and ODI value for group A (12.2667) is more than the ODI in group B (15.2667).

CONCLUSION: This study concludes GROUP A Muscle Energy Technique with Ultrasound is more effective than GROUP B Maitland Mobilization with Ultrasound on reducing Tailbone pain and increase the quality of life.

KEY WORDS: Postpartum Coccydynia, Muscle Energy Technique, Maitland Mobilization, Ultrasound.

INTRODUCTION:

Coccydynia is also recognized as tailbone pain, is described as: "pain in or around the coccyx" and the condition occur approximately more than five times in women than men. In 1859 Simpson first give a descriptive name to the coccyx pain which is known as coccydynia.

The clinical presentation of the condition is usually characterized by sharp shooting pains or sometimes aching pain in the lower sacrum or coccyx especially when sitting on hard surface. The premenstrual period is often associated with exaggerated symptoms in women. It major cause is hypermobility of coccyx or its subluxation and also by direct trauma on the coccyx, vaginal delivery.(1)

The most common symptoms is pain in the tail bone, the pain may be worsened in prolonged sitting position and with hip extension activities, such as stair climbing. There are a lots of recommended management techniques to relieve pressure on coccyx area and to reduce symptoms as: sitting posture through a cushion with cut out in the sacral support part, physical therapeutic pain control modalities and manual therapy techniques as manipulation and physiotherapy some are hot packs, ultrasound are more effective to reduce the pain.(1)

ETIOLOGY: **POST TRAUMATIC:**

EXTERNAL TRAUMA EG: backwards fall that might dislocate (or) break coccyx.

INTERNAL TRAUMA EG: difficult childbirth (or) a child birth with a associated delivery.
MINOR TRAUMA: EG: repetitive sitting on hard surface

NON-TRAUMATIC:

Degenerative disc disease

Hyper and hypo mobility of sacrococcygeal joint

Infection disease

IDIOPATHIC: Idiopathic coccydynia occurs in absence of any pathology in the coccyx. This is typically a diagnosis of exclusion and may result from spasticity (or) other abnormalities that affect the musculature of the pelvic floor. **(**EXAMPLE) over extension of the levator ani muscle can shift the coccyx in to an abnormal position, Sacral rotation due to tightness of piriformis is one of the cause,

Counternutation of sacrum is associated with lumbar extension. So tightness of iliopsoas will leads to abnormal loads on the sacrum and coccyx is one of the causes.[2]

Coccydynia is most commonly affected a female gender than the male. Women's are 5 times more likely to develop coccydynia than men. In 2023, 86.7% of people affected by postpartum coccydynia with age of 20 to40year females. Coccydynia after C-section while 93.5% had coccydynia and after episiotomy 70% of people had coccydynia[3]

There are several article about muscle energy technique, maitland mobilization technique and ultrasound therapy to treat and reduce tailbone pain. But there is no evidence of comparing the muscle energy technique, maitland mobilization technique along with ultrasound therapy in reducing pain in coccydynia.

Muscle energy techniques (METs) are a form of osteopathic manipulative diagnosis and treatment in which the patient's muscles are actively used on request, from a precisely controlled position, in a specific direction, and against a distantly applied counterforce.[4]

Benefits of MET:

- Restoring normal tone in hypertonic muscles
- Strengthening weak muscles
- Preparing muscles for subsequent
- Stretching Increasing joint mobility

Maitland defines "mobilization as passive movement that is performed with a rhythm and a grade in a manner in which the patient is able to prevent the technique from being performed"[5]

GRADES OF MOBILISATION:

- Grade 1 - Small amplitude movement performed at the beginning of the range
- Grade 2 - large amplitude movement performed within the range
- Grade 3 - large amplitude movement performed up to the range
- Grade 4 - small amplitude movement performed at the limit of the range
- Grade 5 - high velocity thrust performed at the limit of the range.

Ultrasound refers to mechanical vibrations which are essentially the same as sound waves but of a higher frequency (>20,000Hz). Such waves are beyond the range of human hearing (20 – 20,000Hz) and therefore also be called ultrasonic waves. [6]

Frequency: 1 MHz for deeper tissue penetration, 3 MHz for superficial tissue penetration.

Intensity: Power is the total energy/second supplied by the machine and is measured in **Watts**

Duration: Amount of energy depends on intensity and duration of treatment. Size of the area determines the treatment duration - 1-2 minutes for every cm2. Many transducer heads have an area of 5

cm^2 and the palm of the small hand is about $50cm^2$. Minimal duration: 1-2 minutes, Maximal duration: 8 minutes and Average duration: 5minutes. Ultrasounds is effectively reduce the pain and enhance tissue recovery and also relax tissue tension and promote healing.

LITERATURE REVIEW:

Heba embaby, salwa et al (2017): The MET was effective, more comfortable, and safe for the treatment of postpartum coccydynia. There was statistically significant reduction in pain intensity and functional ability.

Ayesha Basharat, Muhammed Mustafa (2023): The study state that stretching exercise and maitland mobilization effectively relieved pain and improved postpartum coccydynia's recovery time.

Heba F.hamadto, Magda S. morsy et al (2021): State that therapeutic ultrasound is more effective than the other treatment in alleviating pain in women suffering from coccydynia after delivery.

Vishnupriya suresh, jagathessan at el.(2022): Stated that coccydynia is strain or discomfort in the area of coccyx. The common causes are trauma in the gluteal region, repetitive microtrauma, or childbirth. Although tension and damage of ligaments attached to coccyx have been though to be the general cause for coccydynia occurring after childbirth

MATERIAL AND METHODS:

The total number of 30 subjects was selected using random sampling technique based on the inclusion and exclusion criteria. The study was explained to the subjects and written consent has been obtained from the participants. The participants were divided into two groups- Group A and Group B. Randomly the participants were allotted in two groups containing 15 subjects each. Initially the subjects were assessed and measured by ODI and NPRS.

1. **Group A** consists of 15 participants and they in the Muscle Energy Technique along with ultrasound. The Group A performed MUSCLE ENERGY TECHNIQUE Post Isometric Relaxation (PIR) for Hamstring and Iliopsoas muscle along with Ultrasound Therapy.

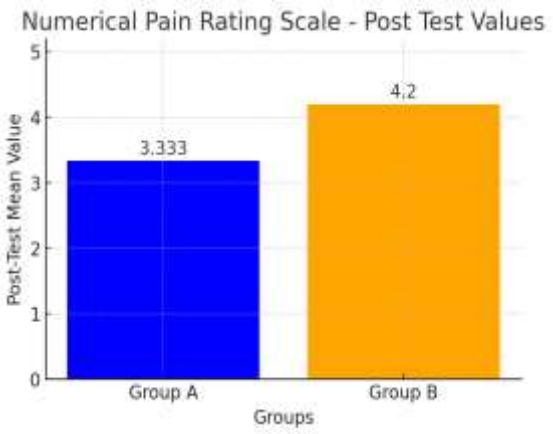
MET Treatment of the iliopsoas muscle: To treat the left side, the patient adopts the position as the modified Thomas test. The patient's right foot is placed into the therapist's left side and pressure is applied by the therapist to induce full flexion of the patient's right hip. Stabilizing the patient's left hip with their left hand, the therapist puts their right hand just above the patient's left knee. The patient is asked to flex their left hip against the therapist's resistance for 10 seconds. This specific contraction of the iliopsoas muscle will induce a PIR. Following the PIR, and during the relaxation phase, the therapist slowly applies a downward pressure. This will cause the hip to passively go into extension and induce a lengthening of the left iliopsoas. Gravity will also play a part in this technique, by assisting in the lengthening of the iliopsoas

MET Treatment of the Hamstring muscle: Patient position: Patient lie on supine lying with their limb is 90 degree hip flexion and the therapist stand beside the patient and ask the patient to contract their hamstring muscle by attempting to bend their knee against resistance hold for 10 second and maintain patient leg in same position ask them hold the contraction for 10 second. Slowly lengthen the patient hamstring muscle by strenghtening their knee. Move slowly and smoothy maintaining control throughout the range.

2. **GROUP B:** 15 Participants in group B performed Maitland mobilization along with ultrasound and the procedure is Patient position**:** prone lying, Therapist position**:** walk standing beside the patient of the asymptomatic side Procedure : Thumb is placed in coccyx and apply a gentle pressure to Coccyx in posterior to anterior direction hold 15 sec. Then increase the pressure amplitude of mobilization still in posterior direction.

FINDING AND ANALYSIS:

The mean value of NPRS in group A (Muscle energy technique along with ultrasound) (3.333) is more than the NPRS in group B (Maitland mobilization with ultrasound) (4.200) and ODI value for group A (Muscle energy technique with us) (12.27) is more than the ODI in group B (Maitland mobilization with ultrasound) (15.27).



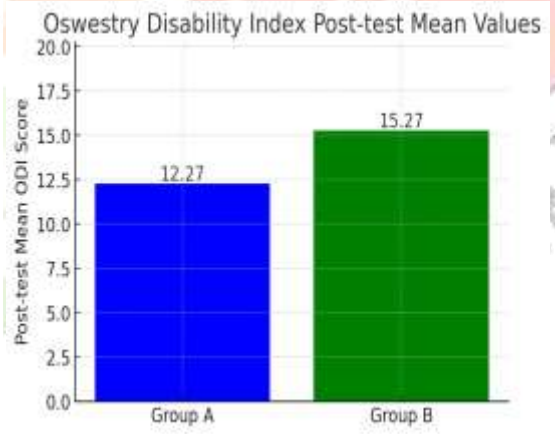


FIGURE1: post test values of group A and B **FIGURE2:** post test values of group Aand B

DISCUSSION:

Coccydynia is a painful condition of the coccyx which may result from repeated or extended sitting on narrow, hard or uncomfortable surfaces. This study aimed to compare the results of MET along with ultrasound and Maitland Mobilization along with ultrasound technique to increase the amount of time to sit. MET along with ultrasound to increase the amount of time that patients with coccydynia could sit without experiencing discomfort and to improve their NPRS and Oswestry Disability Index scores.

Hamstring and iliopsoas play a vital role in the stability and movement of the pelvis. However, spasms of these muscles can cause abnormal loads and sacral rotations resulting in coccydynia. In contrast to traditional physiotherapy methods, MET to the hamstring and iliopsoas muscles has been shown to

reduce the pain threshold under pressure and increase the amount of time that a person may sit without experiencing pain.

According to Maitland, pain in coccydynia would usually disappear when treated with appropriate mobilization. Further, suggested that minor positional faults occur following injury or strain resulting in movement restrictions or pain, but when correctional mobilization is sustained, pain-free function could be restored and several repetitions bring about lasting improvements.

RECOMMENDATIONS:

• The recommendation is to make more studies with larger sample which provides more

accurate results.

• The long term effects of the study are recommended to be notes in upcoming study.

•This study is limited in age group between 21 to 40 years females and Intervention was given only for 6 weeks Number of subjects can be included more than 30 subjects to get more result.

• TENS and shockwave diathermy can also be used to treat coccydynia.

CONCLUSION:

This study concludes that Muscle energy technique along with ultrasound therapy and Maitland mobilization along with ultrasound both reduces the Postpartum coccyx pain and increase the quality of life in postpartum patients, but while comparing Group A (MET along with ultrasound therapy) shows more significant reduction in pain and increase in quality of life than the Group B (Maitland mobilization along with ultrasound therapy).

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