EFFECT OF MYOFASCIAL RELEASE TECHNIQUE ON POSTNATAL SACROILIAC JOINT PAIN

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Abstract

Background: A substantial proportion of pregnancy related back pain originates in the sacroiliac joint(SIJ), which may persist postnatal. Myofascial release is the application of a low load, long duration stretch to the myofascia to decrease pain and improve function through normalizing the sliding properties of myofascial restricted tissues. **Purpose:** This study was aimed to determine the effect of myofascial release technique on postnatal SIJ. **Subject & Methods:** Fifty multigravidae postpartum women participated in this study who were complaining from sacroiliac joint pain. Women were selected randomly from outpatient clinic of Deraya University in El Minya, their ages ranged from 26 to 35 years old and their body mass index (BMI) didn`t exceed 30kg/m^2. The participants were assigned into two groups of equal number. Group (A) (25 patients) treated by lumbo-pelvic stabilizing exercises, 3 sessions per week for 8 weeks and group (B) (25 patients) treated by lumbo-pelvic stabilizing exercises and myofascial release technique, 3 sessions per week for 8 weeks. All subjects in both groups were assessed through visual analogue scale (VAS) to measure pain intensity and modified Oswestry disability questionnaire was used to assess functional disability before and after treatment. **Results:** it was revealed that there was a statistically significant improvement in pain and functional disability in group (B) than group (A). **Conclusion:** The performance of myofascial release technique along with lumbo-pelvic stabilizing exercise was more effective in reducing SIJ pain intensity, functional disability and pain sensitivity in postnatal women.

Keywords: Myofascial release technique- Postnatal pain- Sacroiliac joint.

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Introduction

Many women suffer from musculoskeletal problems during and after pregnancy due to dramatic changes that occur to the body during this period, one of these problems is the low back pain (LBP). A substantial proportion of pregnancy related back pain originates in and around the SIJ which may persist for 2 and 3 years postnatal due to a combination of mechanical, hormonal, circulatory and psychosocial factors. Well-known spine specialists found that SIJ pain probability in pregnant women was nearly 89% and in postpartum woman was 26% **(Ghodke et al., 2017).**

Physiotherapy is the first line of management for LBP; it has been shown to be effective in the management of SIJ pain. Pain can be addressed by modalities such as ultrasound, heat, cold. Manual techniques as joint mobilization to the locked joint, pelvic stabilizing exercise with SIJ belts for the lax joint and other techniques to treat the tightness of the SIJ surrounding muscles such as deep tissue massage, stretching and myofascial release **(Henley and Wollam, 2006).**

MFR therapy is very effective in reducing pain and functional disability in patients with chronic LBP. It can be defined as a form of manual therapy that involves the application of a low load, long duration stretch to the myofascial complex, intended to restore optimal length, decrease pain and improve function **(Ajimsha, 2018).**

MFR is able to normalize the length and the sliding properties of myofascial restricted tissues, also releasing pressure from the pain-sensitive structures and restoring the mobility of the joints through encouraging the circulation of fluid in and around the tissues to enhance venous and lymphatic systems and aid in decongesting areas of fluid stasis, altering concentrations of several circulatory pain mediators (including endocannabinoids and endorphins) after MFR beside stimulating joint proprioceptors, via stretching of a joint capsule, which is capable of reducing pain by inhibiting the smaller diameter nociceptive neuronal input at the spinal cord level **(Laimi et al., 2017).**

There are two main MFR techniques used in treatment of SIJ pain: direct and indirect release, and myofascial release technique by patients themselves called "self-myofascial release" it is Through using tools as roller massagers **(Laimi et al., 2017).**

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Subject, materials and methods

This study was carried out on fifty multigravidae postpartum women complaining from SIJ, they were selected randomly from outpatient clinic of Deraya University in El Minya. This study was conducted from May 2018 to November 2018.

Inclusive criteria

These patients were chosen under the following criteria:

1) Their ages ranged from 26 to 35 years old.
2) Their body mass index (BMI) didn`t exceed 30kg/m^2.
3) Physician diagnosed all women as unilateral SIJ pain patients.
4) They did not receive any medical treatment during the research period.

Exclusion criteria

Subjects were excluded for the following criteria:

1) Cases of lumbar disc herniation, Lumbar spinal stenosis, lumbar disc herniation, degenerative disc disease, spondylolisthesis or degenerative joint disease.
2) History of back or pelvic trauma and any surgery of back or lower extremities.
3) Cases that were still undergoing medical treatment.
4) Women with BMI exceeding 30kg/m^2.
5) Patients who have neurological irritative conditions of the pelvis**.**
6) Patients with other pain conditions e.g. Cancer pain.
7) Patients with systemic disorders such as cardiovascular disorders.
8) Patients with contra-indications to treatment e.g. hemophilia, advanced liver disease and psychosis **(Embaby et al., 2016 and Watson, 2012).**

Design of the study:

1- Group A (control group):

This group consisted of 25 patients with postnatal unilateral SIJ. They were treated by lumbo-pelvic stabilizing exercises, 3 sessions per week for 8 weeks.

2- Group B (study group):

This group consisted of 25 patients with postnatal unilateral SIJ. They were treated by lumbo-pelvic stabilizing exercises and myofascial release technique, 3 sessions per week for 8 weeks.

I: Materials

A. Evaluation materials: were done for all patients in both groups (A,B):

1) Visual analogue scale
2) Modified Oswestry disability questionnaire

B. Treatment materials:

1) **Plinth:** It was used during performing exercises and myofascial release technique for all patients in both groups (A&B) during the eight weeks of the study.
2) **Pillow:** It was used below the waist of the patient while performing myofascial release technique on the quadratus lamborum muscle and thoracolumbar fascia to exaggerate the stretch of the muscle**.**

II: Methods

A. Evaluation methods:

1) Weight and height scale **:** It was used to measure weight and height to calculate BMI for each woman in both groups (A&B) before beginning of the study
2) Visual analogue scale (VAS): It was used to assess the level of pain for each woman in both groups (A&B) before and after treatment

3) Modified Oswestry disability questionnaire: It was used to assess functional disability for each woman in both groups (A&B) before and after treatment

B) Treatment methods:

1) **Lumbo-pelvic stabilizing exercises:**

a) Posterior pelvic tilting : From the crock lying position, contracting abdominal and gluteal muscles, holding for 5 seconds and relaxing for 10 seconds, repeated 5 times each session.

b) Bridging exercise : From the crock lying position, asking the woman to raise her pelvis from plinth holding for 5 seconds then relax for 10 seconds, repeated 5 times each session.

c) Bilateral hip abduction_adduction: From the crock lying position, asking the woman to move her knees away and towards each other against therapist hand, holding for 5 seconds then relax for 10 seconds, repeated 5 times each session.

d) Bilateral knee raise exercise: From the supine lying position, asking the woman to straight leg raise her right leg then repeat to the left leg against therapist hand, holding for 5 seconds and relax for 10 seconds, repetition of each exercise 5 times each session for each leg.

e) Hip shrugging exercise: From the half crock lying, asking the woman to contract abdominal muscles and draw the straight leg raise towards the ribs then repeat on the other leg, holding for 5 seconds and relax for 10 seconds, repetition of each exercise 5 times each session for each leg.

2) **Myofascial release technique (MFR):**

The duration of MFR technique for each muscle was 90 to 120 seconds, then each stroke for each muscle was repeated two times each session.

a) MFR of the erector spinae muscles : The patient assumed prone position, the therapist was standing at the level of the patient's pelvis on the treatment side applying the cross hand MFR technique.

b) MFR of the quadratus lamborum muscle and thoracolumbar fascia: The patient assumed side lying position on the non-treated side with a pillow under the waist to increase the stretch over the muscle. The therapist was standing behind the patient at the level of the patient's pelvis

applying the cross hand MFR technique.

c) MFR of the piriformis muscle: The patient assumed side lying position, with the side treated uppermost. The uppermost lower limb was placed in hip flexion and adduction, placed in front of the lowermost lower limb of the patient to increase the stretch of the muscle. The therapist was standing behind the patient at the level of the patient's pelvis applying the transverse stroke MFR technique through the muscle using knuckles.

d) MFR of the gluteus medius muscle: The patient assumed side lying position on the non-treated side. The therapist was standing behind the patient at the level of the patient's pelvis applying the vertical stroke MFR technique through the muscle using knuckles.

Statistical analysis

- Results were expressed as median (minimum-maximum). Test of normality, Kolmogorov-Smirnov test, was used to measure the distribution of data measured pre-treatment, Accordingly, comparison between normally distributed variables in the two groups was performed using unpaired t test.
- In not normally distributed data, comparison between variables in the two groups was performed, using Mann Whitney test. While comparison between pre- and post-treatment data in the same group was performed, using Wilcoxon Sign Ranks test, To get the actual effect of training programs median difference was calculated from the equation: - pre-treatment – post-treatment or vice versa whenever it was appropriate, Statistical Package for Social Sciences (SPSS) computer program (version 19 windows) was used for data analysis. P value $\leq$ 0.05 was considered significant.

Results

1- Physical characteristics of the mothers in both groups:

The mean values (± SD) of age in both groups A and B were 30.88 ± 2.80 yrs. and 29.66 ± 2.60 yrs., respectively. There was no statistical significant difference between the two groups (t= 1.597, p= 0.117**).** The mean values (± SD) of weight in both groups A and B were 73.18 ± 7.70 kg. and 72.40 ± 6.90 kg., respectively. There was no statistical significant difference between the two groups (t= 0.377, p= 0.708**).** The mean values (± SD) of height in both groups A and B were 1.60 ± 0.06 m. and 1.61 ± 0.04 m., respectively. There was no statistical significant difference between the two groups (t= -1.012, p= 0.316**).** The mean values (± SD) of BMI in both groups A and B were 28.56 ± 1.50 kg/m^2 and 27.81 ± 2.37 kg/m^2, respectively. There was no statistical significant difference between the two groups (t= 1.339, p= 0.187) **(Table 1).**

Table(1): Physical characteristics of the two studied groups.

Variables	Group A (n= 25)	Group B (n= 25)	t value	P value
Age (yrs.)	30.88 ± 2.80	29.66 ± 2.60	1.597	0.117 (NS)
Weight (kg.)	73.18 ± 7.70	72.40 ± 6.90	0.377	0.708 (NS)
Height (m)	1.60 ± 0.06	1.61 ± 0.04	-1.012	0.316 (NS)
BMI (kg/m^2)	28.56 ± 1.50	27.81 ± 2.37	1.339	0.187 (NS)

Data are expressed as mean ± SD. NS= p> 0.05= not significant.

2- Visual Analogue Scale (VAS)

Within group comparison (intra group comparison)

In group A, there was a statistical significant decrease in the median value of VAS measured at post-treatment [3.0 (1.0-5.0)] when compared with its corresponding value measured at pre-treatment [4.0 (3.0-5.0)] with Z value = -4.072 and p value = 0.001**.** Also in group B, there was a statistical significant decrease in the median value of VAS measured at post-treatment [1.0 (0.0-2.0)] when compared with its corresponding value measured at pre-treatment [4.0 (3.0-5.0)] with Z value = -4.475 and p value = 0.001 **(Table 2).**

Between groups comparison (inter group comparison)

At pre-treatment, there was no statistical significant difference between the median value of VAS in group A [4.0 (3.0-5.0)] and its corresponding value in group B [4.0 (3.0-5.0)] with Z value = -0.176 and p value = 0.860**.** On the other hand, there was a statistical significant difference in the median value of difference in VAS between groups A [1.0 (0.0-2.0)] and B [3.0 (1.0-4.0)] (which was in favor of B, more decrease] with Z value = -5.571 and p value = 0.001 **(Table2).**

Table(2): Intra and inter-group comparison between median values of VAS in the two studied groups measured pre- and post-treatment.

Date of assessment	Group A (n= 25)	Group B (n= 25)	$Z^{\#}$ value	P value
Pre-treatment	4.0 (3.0-5.0)	4.0 (3.0-5.0)	-0.176	0.860 (NS)
Post-treatment	3.0 (1.0-5.0)	1.0 (0.0-2.0)	-5.110	0.001 (S)
Median difference	1.0 (0.0-2.0)	3.0 (1.0-4.0)	-5.571	0.001 (S)
$Z^{\#\#}$ value	-4.072	-4.475		
p value	0.001 (S)	0.001 (S)		

Data are expressed as median (minimum-maximum). NS= p> 0.05= not significant.

S= p< 0.05= significant. $Z^{\#}$= Mann Whitney test. $Z^{\#\#}$= Wilcoxon Sign Ranks test.

3- Modified Oswestry disability Questionnaire

Within group comparison (intra group comparison)

In group A, there was a statistical significant decrease in the median value of modified Oswestry disability questionnaire measured at post-treatment [52.0 (32.0-70.0)] when compared with its corresponding value measured at pre-treatment [60.0 (40.0-80.0)] with Z value = -4.377 and p value = 0.001**.** Also in group B, there was a statistical significant decrease in the median value of modified Oswestry

questionnaire disability measured at post-treatment [28.0 (10.0-40.0)] when compared with its corresponding value measured at pre-treatment [64.0 (40.0-80.0)] with Z value = -4.379 and p value = 0.001 **(Table 3).**

Between groups comparison (inter group comparison)

At pre-treatment, there was no statistical significant difference between the median value of modified Oswestry disability questionnaire in group A [60.0 (40.0-80.0)] and its corresponding value in group B [64.0 (40.0-80.0)] with Z value = -1.089 and p value = 0.276**.** On the other hand, there was a statistical significant difference in the median value of difference in modified Oswestry disability questionnaire between groups A [9.0 (2.0-17.0)] and B [38.0 (10.0-48.0)] (which was in favor of B, more decrease] with Z value = -5.703 and p value = 0.001 **(Table 3).**

Table(3): Intra and inter-group comparison between median values of modified Oswestry disability questionnaire in the two studied groups measured pre- and post-treatment.

Date of assessment	Group A (n= 25)	Group B (n= 25)	$Z^{\#}$ value	P value
Pre-treatment	60.0 (40.0-80.0)	64.0 (40.0-80.0)	-1.089	0.276 (NS)
Post-treatment	52.0 (32.0-70.0)	28.0 (10.0-40.0)	-5.449	0.001 (S)
Median difference	9.0 (2.0-17.0) ↓↓	38.0 (10.0-48.0) ↓↓	-5.703	0.001 (S)
$Z^{\#\#}$ value	-4.377	-4.379		
p value	0.001 (S)	0.001 (S)		

Data are expressed as median (minimum-maximum). NS= p> 0.05= not significant. S= p< 0.05= significant. $Z^{\#}$= Mann Whitney test. $Z^{\#\#}$= Wilcoxon Sign Ranks test.

Discussion

This study was conducted to determine the effect of MFR technique on postnatal SIJ.

Fifty multigravidae postpartum women complaining from SIJ pain. This study was conducted from May 2018 to November 2018. Women were selected randomly from outpatient clinic of Deraya University in El Minya, their ages ranged from 26 to 35 years old and their body mass index (BMI) didn`t exceed 30kg/m^2. They were divided into two groups equal in number, Group (A) (25 patients) treated by lumbo-pelvic stabilizing exercises, 30 minutes, 3 sessions per week for 8 weeks and group (B) (25 patients) treated by lumbo-pelvic stabilizing exercises, 30 minutes and myofascial release technique from 20 minutes, 3 sessions per week for 8 weeks.

Visual analogue scale (VAS) was used to measure pain intensity and modified Oswestry disability Questionnaire was used to assess functional disability or both groups (A and B) before and after treatment.

The results of this study found that, at pre-treatment, all studied variables were statistically comparable. On the other hand, there was a statistical significant difference in the median value of difference in all studied variables between group A and B which were in favor of B, more decrease in case of both VAS and

modified Oswestry disability questionnaire (p= 0.001), it can be concluded that the performance of myofascial release technique along with lumbo-pelvic stabilizing exercise is more effective in reducing sacroiliac joint pain intensity, functional disability and pain sensitivity than lumbo-pelvic stabilizing exercise only on postnatal women.

Also the results are supported by **Desai, (2018)** who found that MFR and ischemic compression are both effective in treating acute trapezitis in young adults, MFR is more effective than ischemic compression on pain, cervical lateral flexion and neck disability in acute trapezitis in young adults. It acts on the taut bands and sarcomere shortening, which activate the latent myofascial trigger points, and effectively decreases the restriction by application of a continuous load over the area of the muscle. MFR acts by relaxing contracted muscles, increasing circulation and lymphatic drainage, and stimulating the stretch reflex of muscles and overlying fascia. This helped to increase soft tissue extensibility, which improved range of motion.

Also the results are supported by **Mohanty et al., (2015)** who stated that MFR is one of the multi-disciplinary rehabilitation protocol that was successful in managing lumbar spondylolisthesis patients as compared to conventional home exercise programme. Patients with spondylolisthesis generally present with hypomobility of the cervico thoracic segments and tightness of the thoraco-lumbar fascia. Hypomobility of the cervico -thoracic segments and tightness of the thoraco-lumbar fascia may lead to compensatory hypermobility around the slipped vertebral segment. Therefore, manual therapy to mobilize the hypomobile cervico-thoracic segments along with myofascial release of the thoraco-lumbar fascia may be effective in managing lumbar spondylolisthesis through breaking down adhesions and improving circulation and lymphatic drainage.

The results of our study was supported also with the study of **Vadivelan et al., (2017)** who found that myofascial trigger point release therapy is most effective treatment than ultrasound in treating the trigger points in upper trapezitis, as muscle spasm in upper trapezius may impair blood supply to the muscle leading to depletion of oxygen, calcium and other nutrients necessary to produce muscle relaxation and also leading to release of inflammatory chemicals, which further increases perception of pain. MFR reduces the sensitivity to pain at tender points, improves pain perception, releases fascial restrictions and reduces anxiety levels. As tissue becomes softer and more pliable after MFR application which helps in restoration of length and health of the tissue that will take off the pressure from pain sensitive structures such as nerves, and blood vessels, as well as restoring alignment and mobility to joints, besides releasing of endorphins which help in alleviating anxiety.

Our results are also in agreement with **Hosseinifar, (2016)** who

considered MFR as one of the effective manual therapy techniques in the treatment of patients with non-specific chronic neck pain through enhancing circulation and lymphatic drainage. As he found that MFR is effective in reducing pain, reducing neck disability index, increasing pressure pain threshold and improving maximum isometric contraction strength of the neck extensor muscles through pain control.

The results are also supported by **Cha et al., (2017)** who found that MFR is effective in improving upper trapezius myalgia and sleep quality in casino employees. The development of fascial restrictions in areas of the body leads to hypertension in other areas of the body as a result of fascial continuity. MFR restores the length and health of the restricted connective tissues, also the nerves, blood vessels and other structures sensitive to pain are relieved off pressure. Furthermore, not only are the analgesic effects of MFR modulated by the activation of the descending pain inhibiting systems, but stimulation and segmental pain modulation of the afferent pathways can be induced by excitation of the afferent A delta fibers.

The results supported also by that of **Ramezani and Arab, (2017)** who stated that sub occipital MFR with exercises can effectively restore cervical muscle strength, especially in cervical rotatory movements. As pain and myofascial stiffness can negatively affect muscle contraction as fascial restriction in one part of the body causes unusual stress in other parts of the body due to fascial continuity, besides the muscular neural inhibition out of pain felt during muscle contraction. So if the pain is the main cause of reduced cervical muscle strength in patients with cervicogenic headache, we should focus on reducing pain and stiffness through applying MFR as it causes capillary dilation and increases the blood flow to the muscle, which in turn increases the removal of waste products that causes stimulation of nociceptors pain fibers there by reducing pain, muscle tension and improving range of motion with removing fascial restrictions.

The results of this study also disagreed with that of **Williams, (2017)** who found that instrumental and hands on myofascial release have both been shown to decrease pain of patients with CLBP, however instrumental assisted myofascial release demonstrates significant greater improvements compared to hands on myofascial release. However hands on myofascial release produces a large effect on the sympathetic nervous system response with whole body increase in blood flow leading to reduction of pain and improvement of overall function, instrumental assisted myofascial release has the same effect besides requiring less time and less effort from the therapist, so improving disability outcomes at a higher level than hands on myofascial release. Therefore instrumental myofascial release should be strongly considered as an intervention to the physical rigors when there are excessive adhesions and when there is a limited time for treatment.

The results of this study found that between groups, the obtained results showed that the statistically highly significant decrease in sacroiliac joint pain intensity, functional disability were better after the performance of myofascial release technique along with lumbo-pelvic stabilizing exercise on postnatal sacroiliac pain. No studies found to identify the effect of myofascial release technique on postnatal sacroiliac pain.

Accordingly, it can be concluded that the performance of myofascial release technique along with lumbo-pelvic stabilizing exercises is more effective in reducing sacroiliac joint pain intensity, functional disability and pain sensitivity than lumbo-pelvic stabilizing exercise only on postnatal women.

Conclusion

The performance of myofascial release technique along with lumbo-pelvic stabilizing exercise was more effective in reducing sacroiliac joint pain intensity, functional disability and pain sensitivity than lumbo-pelvic stabilizing exercise only on postnatal women.

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