



Effect of Dry Needling on Post Natal Low Back Pain

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Article History	Abstract
Received: 16 June 2023 Revised: 03 Sept 2023 Accepted: 07 October 2023	<p>Background: Low back pain is considered one of the most common problems which occurs during pregnancy and may be persistent for months after delivery. It can be disabling and can limit function of mother after delivery. Objectives: The purpose of the study was to evaluate the impact of dry needling on post-natal low back pain. Methods: This study included 50 multiparous women who had experienced low back discomfort (for at least 3 months) after giving birth. Their body mass index did not exceed 30 kg/m², the parity ranged from 2 to 4 times, while the type of birth was normal labor. Their ages ranged from 25 to 35 years old. After being randomly distributed into two groups of similar size, The study group: which included 25 patients, received dry needling on the lower back for 20 minutes, three times per week for six weeks, Additionally, each patient completed an exercise program consisting of abdominal, back, and pelvic floor strengthening exercises as well as postural correction exercises for 60 minutes, three times weekly for a period of six weeks. The control group: which included 25 patients, only completed an exercise program for 60 minutes, three times weekly for a period of six weeks. The pain levels of all women in both groups were assessed using a pressure algometry device and a visual analogue scale before as well as after treatment program. Results: there was a statistically highly significant decrease in visual analogue scale and significant increase in pressure algometry in the study group when comparing both groups (A&B) together. Conclusion: dry needling was an effective method to alleviate post-natal low back pain.</p>
CC License CC-BY-NC-SA 4.0	Keywords: dry needling; post-natal low back pain; pressure algometry; trigger point; visual analogue scale.

1. Introduction

After delivery, post-natal low back pain is a typical issue. Although most women's pain goes away in a few months, some women, particularly those who had back pain before or during pregnancy, especially if their pain started early in pregnancy, may continue to experience pain for a longer period of time. Being overweight also increases the risk of low back pain. 1-2

Pregnancy-related changes are the primary factor in postpartum low back pain. These changes include the woman's increased body weight, which typically rises by 25 to 35 pounds, the shifting of her center of gravity anteriorly due to the growing uterus and foetus, and the beginning of her upper back retraction. These changes increase lumbar curvature and tilt the pelvis anteriorly. The spinal ligaments and back muscles are subjected to greater mechanical stress as a result of this change in body position. The outcome is excruciating back pain or strain.³

The body naturally produces a hormone called relaxin during pregnancy, which allows ligaments in the pelvic area to relax and the joints to loosen up in preparation for labour. These changes are in addition to hormonal changes that occur during pregnancy. The ligaments supporting the spine and attaching the pelvic bones to the spine might weaken as a result of the same hormone, causing severe pain and

instability. The rectus abdominis muscles, which run parallel from the rib cage to the pubic bone, may split in half as the abdominal muscles are strained. Stretching and separating the two recti muscles weakens the abdominal muscles and could make back pain worse.⁴

Pregnancy-related low back pain may last throughout the postpartum period. Postural abnormalities and weak abdominal muscles may be related to this. After delivery, low back pain is more common due to a number of critical aspects that should be taken into account, including the absence of postnatal exercises, an increase in body mass index, a sedentary lifestyle, and physically demanding jobs.⁵

Many new mothers unintentionally make their back ache worse by failing to sit up straight when nursing their baby. Also, the mother's general weariness and stress from caring for a newborn all over the day can make it more difficult for her to recuperate from backaches and pain after giving birth.⁶

Many physical therapy techniques can be used to treat low back pain after delivery, including dry needling, interferential current, transcutaneous electrical nerve stimulation, ultrasound waves, low level laser therapy, infrared radiation, hot and cold packs, massages on the painful area, abdominal and back muscle strengthening exercises, positioning, reducing activities and bed rest, wearing a back belt, and changing one's lifestyle.⁷⁻⁸

For many years, dry needling has been used widely in therapy to treat pain and inflammation. Dry needling has been shown in numerous trials to be an excellent pain treatment technique. After childbirth, dry needling is frequently advised as a treatment for low back discomfort. Benefits of dry needling include being a well-researched, risk-free, and drug-free alternative for the effective management of pain. Dry needling can hasten a patient's transition back to active rehabilitation, which improves pain management, reduces muscular tension, and normalizes motor end plate dysfunctions (the sites from which nerve impulses are delivered to muscles).⁹

The American Physical Therapy Association (APTA) defines dry needling as a skilful intervention that penetrates the skin with a small filiform needle to activate myofascial trigger points, muscle, and connective tissue for the management of neuromusculoskeletal problems. It can be carried out without the injection of any drug using an acupuncture needle or any other needle.¹⁰

The fact that the needle causes a tiny tissue puncture injury explains how dry needling works. At the injured site, there is inflammation (characterized by redness, swelling, pain, and heat). Inflammation prompts the body to send more blood to the region of the damage, which automatically boosts the oxygen supply and speeds up the healing process.¹¹

The local twitch response, or the involuntary contraction of the band of taught muscle fibers within the muscle, is triggered when the dry needle is introduced correctly into the right trigger site in the targeted muscle. Many physiological advantages can occur after this response is activated, including: a reduction in the amount of spontaneous electrical activity produced by the treated muscles, a reduction in the length-tension of the muscle fibers, increased oxygenation and blood flow, Pain relief brought on by a drop in CGRP (Calcitonin gene-related peptide) and SP (substance P) levels, Pain gait theory states that when a big afferent is stimulated, small, slow-moving A delta and C fibers that convey pain signals to the higher brain centers are prevented from doing so.¹²

After childbirth, the dry needling technique is frequently used to treat both acute and chronic low back pain, and it is professionally utilized to relieve pain by a range of healthcare practitioners.¹³

Any mother experience post-natal low back pain should be encouraged to make abdominal exercises to regain her abdominal muscle strength and she should do back and pelvic floor exercise to help in treating her back pain, as well as doing posture correction exercises to regain her normal posture during her daily living activities.¹⁴

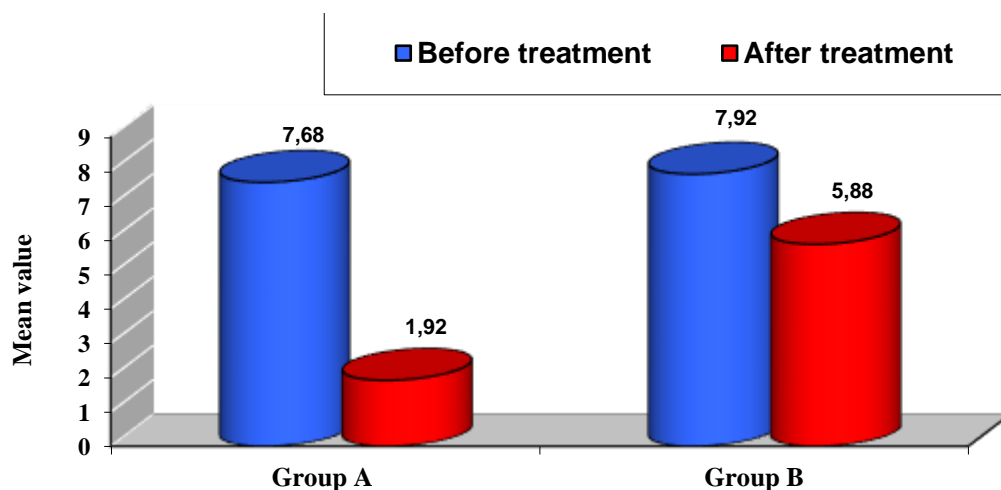


Fig. (1): Illustrates mean values of VAS measured before and after treatment in the two studied groups (A & B) where group (A) is the study group and group (B) is the control group.

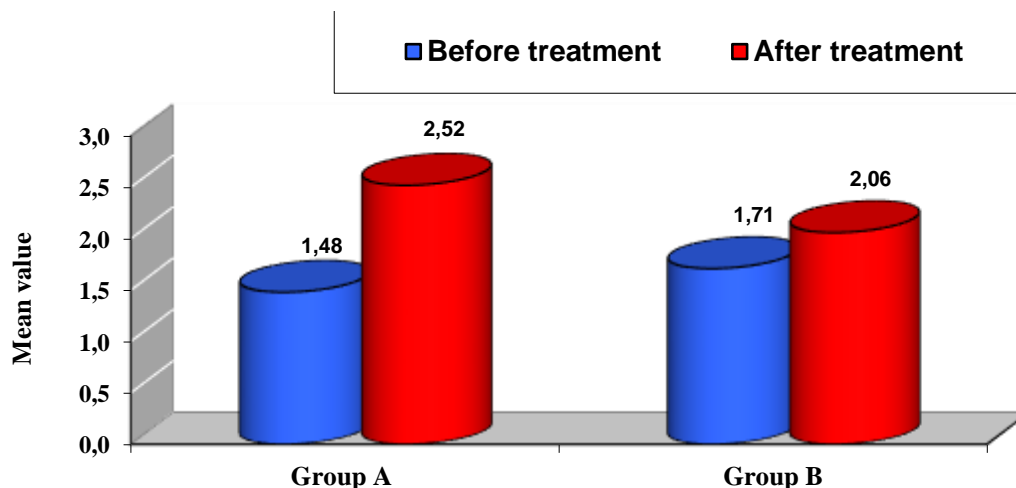


Fig. (2): Illustrates mean values of pressure algometry measured before and after treatment in the two studied groups (A & B) where group (A) is the study group and group (B) is the control group.

Significance of the study:

Up to 75% of women had back pain right after giving birth, making post-natal back pain of a regular occurrence. The new mother may experience moderate to severe crippling pain that interferes with her ability to care for her infant, sleep, and perform other household activities.²⁻¹⁵

Pain can be reduced by using the dry needling (DN) method. In order to address neuromusculoskeletal discomfort and movement concerns, a small filiform needle is used to penetrate the skin and activate the underlying myofascial trigger points, muscles, and connective tissues. Dry needling reduces the quantity and sensitivity of trigger points, which minimises pain severity.¹⁶

Abdominal exercises, posture correction exercises and posterior pelvic rocking exercises are often suggested to postnatal women with low back pain. These exercises help women to return to their normal life without any musculoskeletal problems and regain normal body alignment and muscular strength.¹⁷⁻¹⁸

So, the purpose of this study was to test the effectiveness of dry needling in treating postpartum low back pain.

Hypotheses:

Dry needling had no effect on post-natal low back pain.

2. Materials and Methods

Study design and Ethical approval

This study was a quasi-experimental pretest-posttest study that received approval from the outpatient clinic of the Damamhur Medical National Institute and the ethical council of the faculty of physical therapy at Cairo University (012/002512). After thoroughly explaining the procedure to the women, the consent forms were given to them. Between January 2022 and January 2023, the study was carried out.

Sampling method and Venue:

A convenient sample of multiparous women with low back pain that has persisted for at least three months postpartum were chosen at random from the physical therapy outpatient clinic at the Damamhur Medical National Institute.

Sample size:

Based on a pilot study, sample size was calculated according to the significant difference in the mean value of difference in pressure algometry between control group (0.44 ± 0.26) and study group (1.17 ± 0.95) in two tailed unpaired t test, with $\alpha=0.05$, power of 80%, and an effect size of 0.81. So a sample size of 25 women/per group would be required and increased to 29 women to allow for a 15% dropout rate (GPower 301 <http://www.psych.uni-duesseldorf.de>)

Based on a pilot study, sample size was determined by the significant difference in the mean value of the difference in pressure algometry between the control group (0.44 ± 0.26) and study group (1.17 ± 0.95) in a two-tailed unpaired t test, with a significance level of 0.05, 80% power, and an effect size of 0.81. To account for a 15% dropout rate, a sample size of 25 women each group would be needed, which would then need to be expanded to 29 women (GPower 301 <http://www.psych.uni-duesseldorf.de>)

Participants

This study included 50 multiparous women who had experienced low back discomfort (for at least 3 months) after giving birth. According to the following inclusion criteria, they were selected at random from the physical therapy outpatient clinic at the Damamhur Medical National Institute: age between 25 and 35, BMI below 30, parity between 2 and 4, and normal labour as the mode of delivery.

All participants were free of any gynecological conditions (uterine prolapse, RVF, or chronic pelvic pain), neurological conditions (lumbar disc prolapse, lumbar spondylosis, spondylitis, or spondylolithesis), leukemia, tumors (spinal or pelvic), diabetes mellitus, hypertension, cardiovascular conditions, renal conditions, any psychological conditions, burns, skin conditions, or any spinal deformities.

All females were randomly divided into two groups of equal size. Study group (group A), each patient in this group had needling on their lower back for 20 minutes, three times per week for six weeks. In addition, each patient performed a program of abdominal, back, and pelvic floor strengthening exercises as well as postural correction exercises for 60 minutes, three times a week for six weeks. In the control group (group B), each patient performed the same program of exercises for 60 minutes, three times a week for six weeks.

Instrumentation

Procedures

Before the trial began, each patient in both groups (A and B) had their weight and height measured using a weight-height scale to compute their BMI (Body Mass Index), which is calculated as follows: $BMI = \text{weight (Kg)} / \text{square of body height (m}^2) = \text{kg/m}^2$. All patients in both groups (A&B) were assessed by subjective pain assessments both prior to and during therapy using the visual analogue scale. Patients in both groups (A and B) were assessed also by pain assessments using pressure algometry, before and after treatment. Only patients in the study group were given dry needles.

Subjects' recruitment:

After gathering the consent forms, each woman's name, age, BMI, number of parities, delivery type, delivery date, and examination date were recorded. Patients were selected randomly from Damanhur Medical National Institute's physical therapy outpatient clinic. The researcher looked at each woman's eligibility after reviewing her. The study was taken part in by every eligible lady. The qualified patients were split into two equal groups at random.

Assessment procedures

Before beginning the treatment program, for each patient in groups (A&B) weight, height, number of parities, type of delivery, age, and BMI was recorded accurately. On the visual analogue scale, each patient in both groups (A&B) was asked to mark how severe her low back discomfort was. This was performed both before and after the period of treatment. For each patient in both groups (A&B), pressure algometry was used to measure the location of the trigger points in the lower back. Three measurements were taken for each trigger point, and the average mean of the three values was then recorded. This was performed prior to and following the treatment program.

Treatment procedures

The exercise program (abdominal, back, and pelvic floor strengthening exercises) and postural correction exercises were to be completed by each patient in both groups (A&B) for a total of 60 minutes, three times per week for a period of six weeks. Additionally, patients in the study group received dry needling on their lower back trigger points for 20 minutes, three times per week for a period of six weeks.

Preparation for session:

The environment was calm and welcoming during the session. Patients were received instructions from the therapist for each activity. Patients in the study group were requested to lie prone on a plinth covered by a white sheet with the exception of the lower back area. The trigger points in this region were then located and marked with a pen marker. After that, a piece of cotton soaked in alcohol was used to clean the skin on the lower back.

Dry needling application:

After cleaning the lower back's skin with a cotton ball dipped in alcohol; a sterile disposable thin, stainless-steel needle was put in the trigger points of:

The erector spinae muscles (iliocostalis, longissimus and spinalis) the needle was inserted angled in medial caudal direction toward the lamina of the vertebrae with needle size of 0.25 × 30 mm and 0.30 × 30 mm.

The multifidus muscle the needle was inserted in 45 degrees angle to the muscle fibers directed medially and caudally towards the laminae with needle size of 0.25 × 30-50 mm.

The quadratus lumborum muscle: Care was taken to avoid puncturing the abdominal cavity or pricking the nerve root when the needle was put perpendicular to the muscle from the side via the muscle fibres towards the lamina or the trigger point. 0.30 mm x 30 mm needle size was employed.

The gluteus medius muscle the needle was inserted in inferomedial direction through the muscle fibers toward the trigger point with needle size of 0.25 × 30 mm and 0.30 × 30 mm.

The needles were left in place for 20 minutes before being taken out. For six weeks, this was repeated three times every week.

Statistical Analysis

Results are expressed as mean ± standard deviation. Comparison between variables in the two groups was performed using unpaired t test. Paired t test was used to compare data from the same group's before- and after-treatment periods. Unpaired t test was used to compare post treatment data between the two groups. Data analysis was carried out using the statistical package for social sciences (SPSS) computer application (version 19 windows). P value ≤ 0.05 was regarded as significant.

3. Results and Discussion

In group A, the average age and BMI were 32.00 ± 2.24 years and 27.56 ± 1.45 kg/m², respectively. While they were 27.96 ± 1.09 kg/m² and 31.96 ± 2.26 years old in group B, respectively. Age and BMI did not statistically differ significantly between both groups ($p=0.950$ and $p=0.275$, respectively).

The two groups (A & B) were compared regarding VAS after treatment, and it was discovered that both groups (A & B) showed a decrease in VAS; group (A) achieved 75.0% while group (B) achieved 25.76%; however, the percentage of decrease in VAS was more pronounced and more notable in group (A) when compared with group (B) as demonstrated in figure (1). This means that combining dry needling on the lower back with exercise program was more effective than exercising only.

Both groups (A & B) showed an increase in pressure algometry following treatment, with group (A) achieving 70.3% and group (B) achieving 20.47%, but group (A) percentages of increase in pressure algometry was more pronounced and more notable than that of group (B) as demonstrated in figure (2), indicating that the combination of dry needling on the lower back and an exercise program was more effective than the exercise program alone.

Pregnant women frequently complain about back pain. Axial or parasagittal soreness in the lower lumbar area that is musculoskeletal in origin is how this is typically described. Pregnancy-related low back pain may last throughout the postpartum period. Their self-reported health may be negatively impacted by persistent postnatal low back pain, which can be incapacitating and limit function following delivery. (19)

The use of dry needling originated when medical professionals and researchers discovered that it might relieve pain even in the absence of injections while exploring for ways to treat muscular aches at tender areas.

For many years, dry needling has been used extensively in therapy to treat pain and inflammation. For the treatment of myofascial pain syndrome (MPS), trigger point dry needling is superior to trigger point lidocaine injection and placebo-sham in terms of pain reduction, sleep quality, and the patient's physical and mental well-being.20

In a study on the effects of dry needling on low back pain patients' lumbar multifidus muscle function and nociceptive sensitivity, the researchers found that there were long-lasting and clinically significant sensorimotor alterations.21

Acute reductions in local, reflected, and generalized pain are among the results of dry needling, as are the return of joint mobility and muscle activity as well as the quick return of active myofascial trigger point chemistry to normal. Both peripheral and central sensitization can be lessened by dry needling. Exercise is more helpful when combined with dry needling treatment, which reduces the number and sensitivity of trigger points associated to the pain.22

After giving birth, the pregnant woman should begin back and abdominal muscle strengthening exercises right away. She should also incorporate pelvis tilts into her daily routine and pay close attention to her posture, standing up straight, sitting up straight, and thinking about her posture when feeding her baby. After delivery, it's crucial to begin posture-correction exercises to improve posture and ease back pain.15-23

Study limitations

The participation of women in the conducting process and a lack of funding were two factors that hindered this investigation.

4. Conclusions

It could be concluded from the study's scope and results that the dry needling technique could decrease postnatal low back pain.

Recommendation

The impact of dry needling on low back pain in pregnant women warrants further investigation. It is important to compare the benefits of acupuncture and dry needling on postpartum low back pain in further research.

Source of funding

No specific grant was given to this research by funding organizations in the public, private, or not-for-profit sectors.

Conflict of interest

There are not any conflicts of interest.

Acknowledgement

The mothers who agreed to participate in this study are all being thanked by the authors.

Ethical approval

a. The date and approval reference number. Between January 2022 and January 2023, the study was carried out. The clinical trial (not applicable).

b. The Patient Consent Declaration. Ethics committee of Cairo University's physical therapy faculty (P.T. REC/012/004514). Before beginning the study procedures, women had to complete a written consent form indicating their agreement to participate.

Author's contributions

NMA conceived and designed the study, conducted research, provided research materials, and collected and organized data. SME analyzed and interpreted data. TMZ wrote initial and final draft of article, and provided logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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