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Effect Of Acupuncture Dry Needle Versus Traditional Physical Therapy In Treatment Of Patients With Lower Back Myofascial Pain Syndrome: A Randomized Clinical Trial

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Abstract

Background: low back pain is considered as a public health problem globally. Myofascial pain syndrome is a condition characterized by muscles shortening with increased tone and associated with trigger points that aggravated with activity of daily living. **Objective of the study:** to assess the effect of acupuncture dry needle versus traditional physical therapy in treatment of patients with lower back myofascial pain syndrome. **Subjects and Methods:** Thirty patients their age ranged from 18 - 43 years participated in our study and divided randomly into two equal groups suffering from myofascial low back pain. The first group (A) consist of 15 patients receiving acupuncture dry needle over trigger points of back muscles followed by stretching exercise, the second group (B) consist of 15 patients receiving traditional physical therapy program (Infrared radiation, ultrasonic, stretching and strengthening exercises for back muscles). The following parameters including pain severity, functional disability and lumbar range of motion (flexion, extension, right side bending and left side bending) were measured before and after treatment. **Results:** The Statistical Package for Social Science (SPSS) software version 23 for Windows was used for all statistical analyses. Covariance homogeneity and data normality are tested using the Box's test and the Shapiro-Wilk test, respectively. 2x 2 mixed design MANOVA was used to compare the tested variables of interest in different test groups and measurement times. The alpha level was set at 0.05. Regarding within group's comparison, it revealed that there was significant increase ($p < 0.05$) in Range of flexion and extension and significant reduction ($p<0.05$) in pain severity, right and left side bending and functional

disability at both groups post- treatment. Regarding between subject effects multiple pairwise comparisons revealed that there was significant difference between both groups pre- treatment and post- treatment in pain severity, functional disability and back range of motion ($p<0.05$), at post- treatment in favor to group A compared to group B. **Conclusion:** on the basis of the present date, it is possible to conclude that both acupuncture dry needle and traditional physical therapy were effective in reducing pain severity and functional disability and improve range of motion in treatment of patients with lower back myofascial pain syndrome. However, acupuncture dry needle is more effective than traditional physical therapy in treatment of patients with lower back myofascial pain

Key words: Acupuncture Dry needle, traditional physical therapy, myofascial pain syndrome.

INTRODUCTION

Non-Specific low back pain is considered as a public health problem globally, A Study speculated that the lifetime prevalence of low back pain reaches 62% in adults. While, the mean point prevalence among the adults was 32%. [1]

Individuals with regional pain complaints have a high incidence of myofascial pain. The prevalence ranges from 21% of patients seen in a basic orthopedic clinic to 30% of patients with regional pain seen in a general medical clinic, and up to 85% to 93% of patients presenting to specialized pain management centers. [2]

Myofascial Pain Syndrome (MPS) is a disorder characterized by chronic and severe pain linked with trigger points (TrPs) that are increased by activities of daily living (ADL). [3]

TrPs are hyperirritable region inside a tight band of skeletal muscle that hurt when squeezed may cause symptoms such as discomfort, soreness, and muscle cramping. [4]. TrPs are classified as being active or latent, depending on their clinical characteristics. An active trigger point causes pain at rest. It is tender to palpation with a referred pain pattern that is similar to the patient's pain complaint. [5] This referred pain is felt not at the site of the trigger-point origin, but remote from it. The pain is often described as spreading or radiating. [6]

Referred pain is an important characteristic of a trigger point. It differentiates a trigger point from a tender point, which is associated with pain at the site of palpation only. [7]

A latent trigger point does not cause spontaneous pain, but may restrict movement or cause muscle weakness ling. [8]

The patient presenting with muscle restrictions or weakness may become aware of pain originating from a latent trigger point only when pressure is applied directly over the point Friction. [9]

TrPs restricts motion of the muscles and decreases circulation, depriving the muscle of nutrients and oxygen and resulting in a collection of metabolic waste that cannot filtered away. These wastes excite pain nerve endings and can also damage them. The decrease of nutrients to the muscle increase spasm and inflammation. [10]

Myofascial TrPs can be eliminated through one of several modalities, including trigger-point injection, stretch and spray, dry needling (acupuncture), massage, trigger point pressure release, exercise, and pharmacologic agents. [11]

Needle-based therapies have also been employed in the treatment of MTrPs. Acupuncture point stimulation and trigger

point injection are two examples. Surprisingly, direct needling has been shown to have a direct impact that is independent of the injected TrPs substance. [12] Dry needling benefits include an immediate decrease in local, referred, and generalized pain, as well as restoration of range of motion and muscle activation patterns. [13]

Heat treatment has been shown to be beneficial in easing pain, reducing muscular spasms, and improving disability in patients with acute and chronic low back pain. [14] The connective tissues are considered to remold with repeated heat and stretch, allowing normal functioning to be restored. [15] The favorable results of topical therapeutic US include reports of increased range of motion and decreased pain. [16] Both the spinal flexion and spinal extension exercises provided significant reduction in low back pain severity in chronic mechanical low back pain patient. [17]

There is no study, until now, compare the effects of acupuncture dry needle versus traditional physical therapy on pain severity functional disability and lumbar range of motion (flexion, extension, right side bending and left side bending) in patients with lower back myofascial pain syndrome. Therefore, this study will be conducted in order to determine which of the two treatment protocols is more effective in treatment.

Objectives of the study:

The study was designed to assess the effect of acupuncture dry needle versus traditional physical therapy in treatment of patients with lower back myofascial pain syndrome.

SUBJECTS AND METHODS

Study Design:

The study was designed as an experimental randomized clinical trial. The study was evaluated and approved by the ethical committee of Faculty Physical Therapy, Cairo University, Egypt, (Approval number: P.T.REC/012/004025). The Helsinki Declaration Criteria for human research were followed in this study. A written informed consent was obtained from each patient.

Subjects:

Thirty patients (male & female) with age between 18-43 years participated in the study. Group (A): consisted of 15 patients receiving acupuncture dry needle over trigger points of iliocostalis lumborum, quadrates lumborum, gluteus medius and piriformis muscles followed by stretching exercise. Group (B): consisted of 15 patients receiving traditional physical therapy program (Infrared radiation, ultrasonic, stretching and strengthening exercises for back muscles), were examined for eligibility in the study. Figure (1):

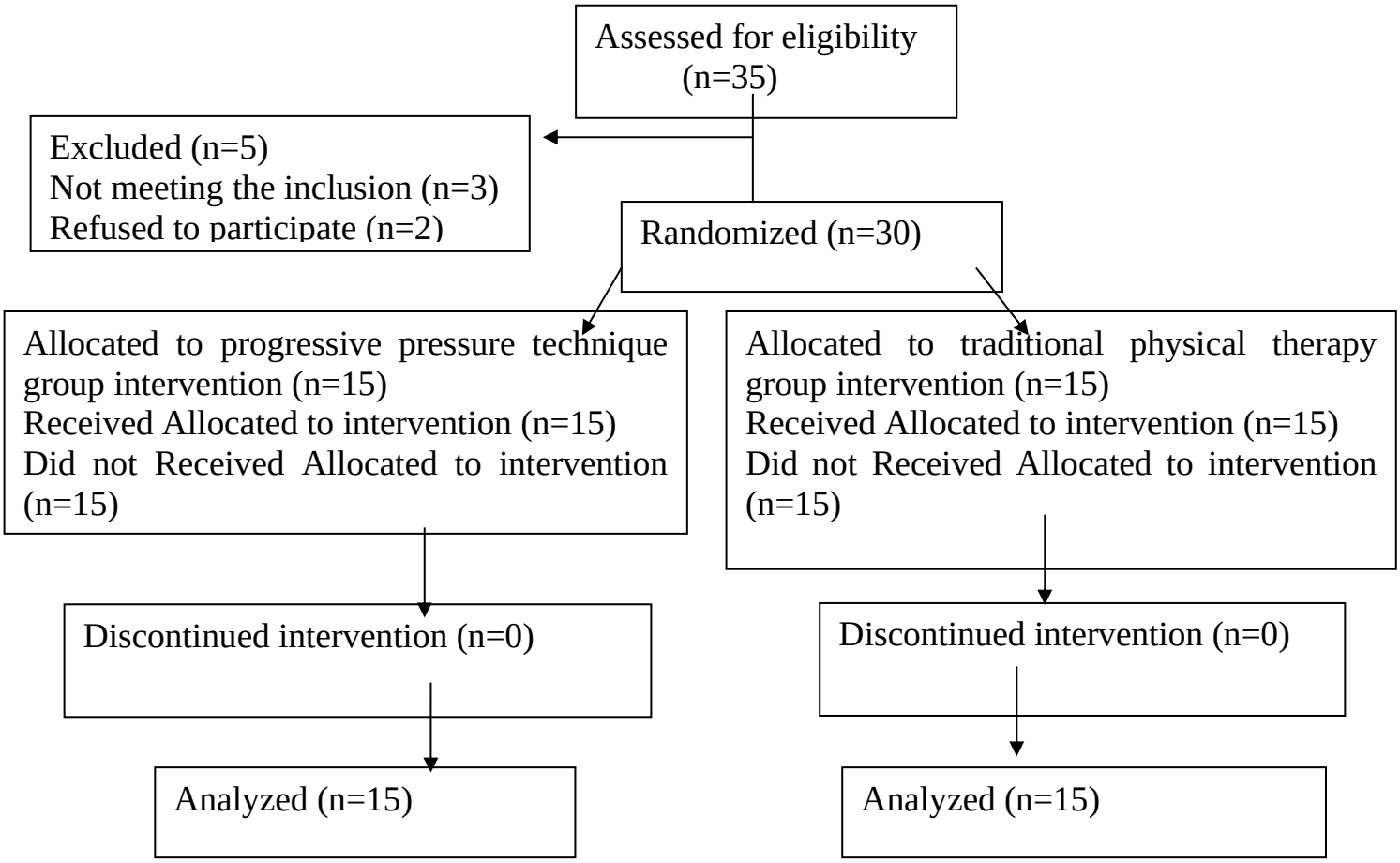

Figure (1): Participant flow diagram

Inclusion Criteria:

- Age ranges from 18 to 43 years old. [18]
- Pain of at least 30 mm to 70 mm on a visual analogue scale (VAS) from 0 mm (no pain) to 100 mm (worst imaginable pain).
- Presence of MTrPs at least in 4 muscles on any side.
- Patients had lower back myofascial pain syndrome for at least 3 months ago.
- **Exclusion Criteria:**

History of previous back surgery, neurologic deficit, current lower extremity symptoms, cardiopulmonary disease with decreased activity tolerance, rheumatologic conditions, polyarticular osteoarthritis, rheumatoid arthritis and advanced lumbar degenerative disease, participants receiving other treatment, in the form of physical therapy or medication, for the duration of the study that may interfere with the results of this study.

Randomization and allocation concealment:

Following the fulfillment of all baseline conditions, participants were randomized using the random permuted block technique to guarantee that the treatment groups were balanced at the conclusion of each block. Using random number generator software, participants were

divided into blocks. For ethical reasons, all patients were requested to sign a permission form.

Instrumentations:

Assessment Instrumentations:

Patients were assessed before and after treatment sessions. The assessment procedures included the following items.

1- Pain assessment:

Pain assessed by Visual Analog Scale (VAS). VAS is a scale that allows continuous data analysis and uses a 10cm line with 0 in one end (no pain) and 10 (worst pain) on the other end .Patients were asked to place a mark along the line to denote their level of pain. [19]

2- Functional disability:

Functional disability of each patient was assessed by Oswestery disability questionnaire (Appendix II). It is valid and reliable tool. It is consists of 10 multiple choice questions for back pain, patient select one sentence out of six that best describe his pain, Higher scores indicated great pain. Scores (0-20%) minimal disability, Scores (20%- 40%) moderate, Scores (40% - 60%) severe, Scores (60%-80%) crippled, Scores (80% - 100%) patients are confined to bed. [20]

3- ROM assessment:

a- Assessment of lumbar flexion and extension:

Modified-modified Schober flexion technique was used based on the work of **Williams et al., (1993)** [21] this method is reliable and valid in measuring range of motion of lumbar flexion.

The investigator stood behind the standing patient to identify the posterior superior iliac spines with her or his thumbs, and then an ink mark was drawn along the midline of the lumbar spine horizontal to the posterior superior iliac spines. Another ink mark was made 15 cm above the original mark; the distance between superior and inferior skin marks was measured. Then the investigator instructed the patient to bend forward into full lumbar flexion and the new distance between superior and inferior skin marks was measured.

Then the investigator instructed the patient to bend backward into full extension and the new distance between superior and inferior skin marks was measured as a straight line. The change in the normal difference between marks was used to measure the amount of lumbar extension. This test was performed for three consecutive times and the mean value was considered as lumbar extension range of motion

b- Lateral flexion:

Lateral flexion was measured as the distance from the tip of the index finger to the floor at maximal comfortable lateral flexion based on the work of **Ponte et al., (1984)** [22] .The subject was instructed to move as far as possible into lateral flexion. This test was performed for three consecutive times for each side and the mean value for each side was considered as the lateral flexion range of motion.

Treatment Instrumentation:

1. Infrared radiation:

Infrared has been used as a form of heat for many purposes. Its model is 4004/2N. The device has a power of 400w, voltage 203v and frequency of 50/60Hz. Infrared is sometimes chosen as a form of heat prior to

stretching, mobilization, traction, massage and exercise therapy.

2. Ultrasonic device:

Ultrasonic device Phyaction 190 serial number 2745, 230V, 300 mA / 50 - 60Hz, Pus: 8w. It is used for pain relief and break down of adhesions in the case of LBP.

3. Acupuncture like needle (Long somatic needle):

Long Somatic Needles 0.30mm in diameter, 50 and 70mm long
used as a treatment tool.

Procedures:

Patients were evaluated both before and after therapy sessions. The following are the assessment procedures:

Diagnosis of MPS:

MPS diagnosis necessitates both a thorough medical history and a clinical assessment. The history highlights the locations of discomfort and aids in determining the risk factors that lead to MPS.

- In clinical examination muscles whose trigger points can refer pain to the affected areas were examined.
- Muscles were palpated searching for taut bands, using either flat palpation or pincer palpation.
- Fingers were moved along the taut band to find the hardest and most tender spot (the trigger point).
- Trps were compressed manually and the patient was asked if the spot is tender or painful, and if so did the pain resemble his usual pain.
- Trp was compressed for 5–10 seconds and the patient was asked if there is pain or some sensation away from the trigger point (referred pain).

Treatment procedure:

1- Treatment procedure for group A (acupuncture dry needle):

First of all, detect the trigger points by palpating a taut band within the muscle belly at the lumbar region. The muscles that have been treated iliocostalis lumborum, quadratus lumborum, gluteus medius and piriformis muscles. The patients received 2 sessions per week for 2 weeks.

Myofascial acupuncture dry needle technique:

An explanation of the procedure to the patient was performed prior to the application of dry needling. The patient should be educated on DN rationale and theory, what to expect during and after the treatment, the type of needle used, precautions, possible side effects, and expected outcomes. Possible fear of needling and pain associated with DN must be addressed. Research has shown that by activating patients' conditioned pain modulation system, patients are able to differentiate and even appreciate the inhibition of their pain by a second noxious

stimulus (the pain associated with DN). [23]

This realization can activate an endogenous pain inhibitory mechanism, which inhibits early nociceptive processing. By placing DN in this broader context, patients can usually tolerate the discomfort associated with DN without risking further sensitization or windup. [24]

When using DN techniques for the treatment of TrPs, the therapist should palpate the target muscle for a taut band and identify a hyperirritable spot within the taut band confirming TrPs to be treated.

Dry needling is usually performed with a solid filiform needle in a tube. The filiform needle in its tube is fixed with the non-needling hand against the suspected area by using a pincer grip or flat palpation depending on the muscle orientation, location, and direction of needle penetration. With the needling hand, the needle is gently loosened from the tube. The top of the needle is tapped or flicked allowing the needle to penetrate the skin. With deep DN, the needle is guided toward the TrP until resistance is felt and a LTR is elicited. The elicitation of a LTR is considered essential in obtaining a desirable therapeutic effect. [25]

The needle is entered deeply enough to completely penetrate the tight band area, then drawn back to the subcutaneous tissue layer but not out of the skin, and then left in the TrP for seven to ten minutes. [26] In general, a large number of LTRs can be evoked. A certain DN operation may be discontinued due to a significant decrease in the incidence or elimination of LTRs, decreased resistance to palpation of the underlying tissue, or patient discomfort of ongoing needling at that specific spot. Once the needle has been fully removed from the skin, pressure (hemostasis) can be given directly to the skin over the needle insertion site using an alcohol swab to help avoid swelling or post-needling pain. The muscle is then palpated again to reassess for taut bands and TrPs. [27]

Muscles treated by acupuncture dry needle:

1-Iliocostalis lumborum:

From side lying position identify the TrP via flat palpation. A needle with 5cm length was inserted slightly superior to the TrP. perpendicular to the skin, and directed inferomedially for about 300. Precautions: Avoid penetration of the lung.

2-Quadraus lumborum:

While the patient was in a side lying position, place the patient's arm in extension to elevate the rib cage; leg is in extension and adduction to drop the iliac crest lower, and use a pillow or bolster under the nontreated side to open up a wider space where trigger points can be easier identified. A needle with 7cm length is inserted just caudal to the 12th rib and anterior to the paraspinal muscle mass; it is directed parallel to the plane of the back (in the frontal plane) toward the L2 and L3 transverse processes.

3-Gluteus medius:

The patient is in side lying position. A needle with 5cm length was used. The muscle is needled with flat palpation perpendicular to the muscle along the contour of the iliac crest. Strong depression of the subcutaneous tissue is required to reduce the distance from the skin to the muscle. Needle contact at the periosteum is common. Precautions: Avoid needling the sciatic nerve. There are also deep branches of the superior gluteal vessels and nerve between the medius and minimums which should be not needled.

Depth of penetration is dependent on the amount of adipose tissue.

4-Piriformis:

The patient is in side lying position. Identify the bony landmarks of the greater trochanter and the sacrum at S2, S3 and S4. A needle 5cm length was inserted perpendicular to the muscle surface at the trochanter or just medial to the sacrum from the sciatic notch toward the pubic symphysis directly into the TrP taut band identified by palpation. Precautions: Avoid needling the sciatic nerve.

2- Treatment procedure for group B: traditional physical therapy:

This group was consisted of 15 patients. They had received traditional physical therapy for 12 sessions over four weeks period:

- Infrared radiation for 20 minutes/session at distance of 60 cm from lumbar region, while patients in prone lying position for 12 session 3/week every other day for one month. [28]
- Ultra sonic: for 5 minutes, 1Hz, continuous mode of application 1.5w/cm2. [15]
- Mild stretching exercises for 30 seconds for hamstring, calf muscles, and back muscles from long setting. [17]
- Strengthening exercises for back muscles (bridging and active back extension). [29] Each exercise was down 3 times at session with hold for 6 seconds.

Statistical analysis

All statistical measures were performed through the Statistical Package for Social Studies (SPSS) version 23 for windows. The current test involved two independent variables. The first one was the (tested group); between subjects' factor which had two levels (Group A & Group B). The second one was the (training periods); within subject factor which had two levels (pre and post). In addition, this test involved six tested dependent variables (pain severity, Range of flexion, Extension, right and left side bending and functional disability). Preliminary assumption checking revealed that data was normally distributed for all dependent variables, as assessed by Shapiro-Wilk test ($p > 0.05$); there were no univariate or multivariate outliers, as assessed by boxplot and Mahalanobis distance ($p > 0.05$), respectively; there were linear relationships, as assessed by scatterplot; no multicollinearity. There was homogeneity of variances ($p > 0.05$) and covariances ($p > 0.05$), as assessed by Levene's test of homogeneity of variances and Box's M test, respectively. Accordingly, 2×2 mixed design MANOVA was used to compare the tested variables of interest at different tested groups and training periods. The MANOVAs were conducted with the initial alpha level set at 0.05.

RESULTS

All statistical measures were performed through the Statistical Package for Social Studies (SPSS) version 23 for windows. The current test involved two independent variables. The first one was the (tested group) between subjects factor which had two levels (Group A & Group B). The second one was the (training periods); within subject factor which had two levels (pre and post). In addition, this test involved six tested dependent variables (pain severity, Range of flexion, Extension,

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Statistical analysis using mixed design MANOVA analyzed thirty patients assigned into two equal groups. It revealed that there were significant within subject ($F= 421.303$, $p = 0.0001$, Partial Eta Squared=0.991), treatment time ($F = 20.273$, $p = 0.0001$, Partial Eta Squared=0.841) and between subject effects ($F = 19.008$, $p = 0.0001$, Partial Eta Squared=0.832). Table (1) present descriptive statistic and multiple pairwise comparison tests (Post hoc tests) for the all dependent variables. In the same context, the multiple pairwise comparison tests revealed that there was significant increase ($p <0.05$) in Range of flexion and extension and significant reduction ($p<0.05$) in pain severity, right and left side bending and functional disability in the post treatment condition compared with the pretreatment one in both groups. Regarding between subject effects multiple pairwise comparisons revealed that there was significant increase ($p <0.05$) in Range of flexion and extension and significant reduction ($p<0.05$) in pain severity and right and left side bending in group A compared with group B. While there was no significant difference ($p >0.05$) between both groups pre- treatment and post-treatment in Functional disability.

Table (1): Descriptive and Inferential Statistics of the Dependent Variables in the Experimental and Control Groups Pre and Post the Study Period.

		Group (A) (n = 15)	**Group (B) (n = 15)**	**P value***
Pain Severity	Pre training	6.13 ± 1.12	6.73 ± 0.45	0.066 ^{NS}
	Post training	3.36 ± 1.90	5.42 ± 0.28	0.001^{S}
	% of change	45.18 ↓↓	19.46 ↓↓	
	P value**	0.001^{S}	0.001^{S}	
Range of Flexion	Pre training	3.7 ± 0.56	3.75 ± 0.38	0.764 ^{NS}
	Post training	6.76± 0.94	4.81± 0.27	0.001 ^{S}
	% of change	82.7 ↑↑	28.26 ↑↑	
	P value**	0.001^{S}	0.013^{S}	
Range of Extension	Pre training	1.52± .24	1.47± 0.18	0.563 ^{NS}

	Post training	2.32 ± .41	1.9 ± 0.12	0.001^{S}
	% of change	52.63 ↑↑	29.25 ↑↑	
	P value**	0.001^{S}	0.001^{S}	
Range of Right side Bending	Pre training	48.59 ±3.65	48.6±3.76	0.992 ^{NS}
	Post training	44.57 ± 4.78	26.1 ± 2	0.001 ^{S}
	% of change	8.27 ↓↓	46.29 ↓↓	
	P value**	0.001^{S}	0.001^{S}	
Range of Left side bending	Pre training	49.22 ± 3.18	49.22 ± 3.13	0.991 ^{NS}
	Post training	45.05 ± 4.81	26.78± 1.45	0.001 ^{S}
	% of change	8.47 ↓↓	45.59 ↓↓	
	P value**	0.001^{S}	0.001^{S}	
Functional Disability	Pre training	47.33± 4.16	47.73± 2.78	0.76 ^{NS}
	Post training	30.73 ± 7.83	34.13 ± 1.4	0.109 ^{NS}
	% of change	35.07 ↓↓	28.49 ↓↓	
	P value**	0.0001^{S}	0.0001^{S}	

* Inter-group comparison; ** intra-group comparison of the results pre and post training.
^{NS} P > 0.05 = non-significant, ^{S} P < 0.05 = significant, P = Probability.

DISCUSSION

The results of this study revealed that both acupuncture dry needle and traditional physical therapy were effective in reducing pain severity and pressure pain threshold in patients with lower back myofascial pain syndrome and result in similar outcomes followed by stretching exercise in patients with myofascial back pain syndrome after treatment. Because physical therapists generally use a multimodal treatment approach, it would be interesting to see if acupuncture dry needle or traditional physical therapy would add any additional benefit for the management of myofascial back pain.

A. acupuncture dry needle group (A):

Needle or and traditional physical therapy technique was similarly effective in reducing pain severity and pressure pain threshold in patients with myofascial back pain syndrome. This study showed a significant improvement in pain level, functional disability and back range of motion compared with pre-treatment scores in both groups. This finding is in accordance with other studies showing the effects of DN in patients with myofascial pain syndrome. **Edwards and Knowles (2003)** [29] hypothesized that DN followed by active stretching is more effective than stretching alone, or no treatment, in the management of myofascial pain. **Ga et al.,**

(2007) [30] revealed that DN of TrPs in elderly patients resulted in a slight reduction of pain especially when the DN was combined with paraspinal needling.

In a systematic review focused on DN in athletes **Teasdale (2009)** [31] investigated four comparisons: 1) DN vs. placebo or no treatment; 2) DN vs. standard care; 3) DN vs. standard acupuncture; and 4) DN vs. wet needling. She concluded that DN in athletes was more beneficial than sham acupuncture or no treatment, and that no safety problems were reported. She also noted no statistically significant benefit with dry needling compared to standard care. However, when comparing dry needling to standard acupuncture, she found a statistically significant benefit to dry needling, and noted that dry needling has been shown to reduce pain, increase quality of life, and increase range of motion beyond that produced with standard acupuncture. She concluded, "For athletes, this treatment has the ability to have a positive impact on pain, performance, and quality of life," especially if used in conjunction with stretching, exercise therapy, and other non-invasive treatments.

Most recently, **Rainey (2013)** [32] described the case of a 30-year female on active military duty who injured her low back while weight lifting. She was diagnosed with a lumbar segmental instability along with right hip

Investigators have attributed the therapeutic effects of DN to various mechanisms, such as mechanical, neurophysiologic and chemical effect. [33] It is thought that DN provides a mechanical localized stretch to the shortened sarcomers and contracted cytoskeletal structures within the TrP. This would allow the sarcomere to resume its resting length by reducing the degree of overlap between actin and myosin filaments. [33][34]

From a neurophysiological perspective DN may stimulate A-delta nerve fibers, which in turn, may activate the enkephalinergic inhibitory dorsal horn interneurons, resulting in opioid mediated pain suppression and pain relief. [33]

For the chemical effect of DN, some studies have demonstrated that the increased levels of bradykinin, CGRP, substance P, and other chemicals at TrP are directly corrected by eliciting LTR following DN. [35]

DN may influence the microcirculation. Several investigators have demonstrated that needle insertion in the muscles increased both skin and muscle blood flow in the stimulated region. [36]

B. Traditional physical therapy program group (B)

From statistical analysis of pre and post values of pain assessment in the Traditional physical therapy program group, there was a decrease in back pain at the end of treatment rather than pretreatment values and this difference was significant. Pain reduction may be due traditional physical therapy and may be attributed to: The effect of in infrared which has been used as a form of heat for pain relief, and reduction of muscle spasm. Also an in increase in sensory responses via an increase in endorphins, which could affect the pain gate mechanism.[37] Heat application had been proven to be effective in relieving pain, reducing muscle spasm and disability in acute and chronic (LBP).[14]

- Ultrasonic increases the threshold of pressure produced by pain receptors. The conduction velocity of large diameter nerve fibers (A beta) increased after application of ultrasonic while the conduction velocity of small diameter nerve fibers (A delta fibers) that are responsible for pain decreased. [38]

It causes a significant tissue heat that alters the viscolestic properties of connective tissue making it move extensible. [15]

Khalil et al., (1992) [39] showed that stretching exercises for back muscles and hamstrings helped in reducing pain and improving flexibility of low back pain patients.

Concerning functional disability there was significant decrease of functional disability post treatment of the traditional program group, used oswestry disability questionnaire to assess patient's level of functional disability, they report decrease in functional disability. [40]

Myoelectric activity level increased after strengthening exercises reflects improve function of neuro muscular system because individual is capable of voluntarily recruiting move motor neuron and increasing their firing rate. [41]

This finding also, has been supported by **Johansson et al., (1995)** [41] who found that dynamic exercises for back and abdomen with stretching exercises were effective in reducing functional disability. Improve multifidus muscle strength (which atrophy in low back) pain improve functions. [42]

Regarding the range of motion of lumbar flexion, extension, right side bending and left side bending, from the statistical analysis of pre and post values there was a significant increase in lumbar range of motion (flexion, extension, Rt side bending, Lt side bending) at traditional physical therapy program group. This finding supported by **Magnsson et al., (1998)** [43] who found that functional ability and range of motion of lumbar flexion, extension, lateral right bending and lateral left bending improved after physical therapy program included strength and flexibility exercises because of increase muscle strength, reduction of pain, improve muscle flexibility and improve motor control skills.

Improved range of motion has been associated with symptoms relief in patients with chronic back problem after flexibility program supporting the finding of **Battie et al., (1990).** [44]

Jari et al., (2004) [45] reported that increased trunk flexion range of motion after flexion and extension exercises due to increased flexibility and mobility of the trunk. Improvement of patients physical activities, psychological status and relief of pain responsible for decrease disability and increase range of motion this was supported by **Sullivan et al.,(2000).**[46]

On the basis of the present date, it is possible to conclude that both acupuncture dry needle and traditional physical therapy were effective in reducing pain severity and functional disability and improve range of motion in treatment of patients with lower back myofascial pain syndrome. However, acupuncture dry needle is more effective than traditional physical therapy in treatment of patients with lower back myofascial pain.

Acknowledgment:

The authors would like to thank all individuals who participated in this study.

Ethics Statement:

The study was designed as an experimental randomized clinical trial. The study was examined and approved by the ethical committee of Faculty Physical Therapy, Cairo University, Egypt, (approval number: P.T.REC/012/004025). The Helsinki Declaration Criteria for human research were followed in this study. A written

informed consent was obtained from each patient.

Authors Contributions:

AMF, AMY and GMR took part in the concept and design of the study. AMF and AMY contributed to applying each treatment according to the treatment schedule. MAA and RAA participated in acquisition of data. GMR contributed to Data analysis and interpretation. All authors collaborated on the study's statistical analysis, interpretation of the data, writing, and editing.

Disclosure statement:

No authors have any financial interest or received any financial benefit from this research.

Conflict of interest:

Authors state no conflict of interest.

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