Comparative Study Of Dry Needling V/S Transcutaneous Electrical Nerve Stimulation In The Treatment Of Hamstring Strain In Football Players

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Abstract: Background: Myofascial pain syndrome is defined as sensory, motor and autonomic symptoms that are caused trigger points (MTrP). It is defined as a hyperirritable spot in skeletal muscle, which is associated with hypersensitive palpable nodule in a taut band. Objectives: Present study was undertaken to add on to available treatment methods for myofascial Trigger points and to find out the effectiveness of dry needling and Transcutaneous Electrical Nerve Stimulation (TENS) therapy for treating myofascial trigger point. Material And Methods: In this study, 32 participants were recruited based on inclusion and exclusion criteria. Dry Needling and TENS therapy was administered to them for a period of 2 weeks, 6 sessions in 2 weeks. Pre and post assessment were taken using following outcome measures- Pain Pressure Threshold, Numerical Pain Rating Scale (NPRS), Functional Assessment Scale for Acute Hamstring Injuries (FASH) Result: There was significant decrease in Pain due to hamstring injury on NPRS, agility score and increase in Pain Pressure threshold in patients which is suggestive of decrease in pain and improve functional independency. The outcome of Pressure Algometer, Agility score and NPRS were statistically analyzed. It was found to be effective with significant P value<0.000. Conclusion: Statistically both Dry Needling and TENS are competent enough to alleviate pain but clinically TENS having better response in pain depletion and in increase in functional independency compared to Dry Needling. [Palekar P Natl J Integr Res Med, 2022; 13(2): 01-05, Published on Dated:10/05/2022]

Key Words: Dry Needling (Dn), Transcutaneous Electrical Nerve Stimulation (Tens),Hamstring

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Introduction: In patients, the common cause of Myofacial Pain Syndrome is found to be myofascial trigger points (MTrPs), MTrPs are restricted locations of stiff, band-like inflexible part of muscular system that characteristically have hyperactive zones. MTrPs develops in body as a respond to abrupt injury, muscle over loading or tedious micro trauma. When compressed, There is alleviation of pain, motor dysfunction, autonomic phenomena which leads to local referred tenderness and pain. MTrPs can give rise to impairing motion of joints increase compassion to elasticity. Literature suggests that spontaneous pain is caused by active MTrPs[1].

It's outlined as a temper location in muscle that is related to supersensitised tangible knot in a tight muscle band. Once compressed, MTrP leads to characteristics like hurting, tenderness and motor disorder. It decreases muscle flexibility, manufacture muscle weakness and deform interception. In the athletic community, hamstring muscle strains are the most common muscle injuries. There is similar rate of hamstring injury cases for the athletic as well as non-athletic person when there is increase in their level of fitness. Muscle weakness, lack of muscle extensibility, inadequate warm-up, fatigue, increased muscle neural stress, and dyssynergic contractions have all been reported to predispose to hamstring injuries. Hamstring strain is most common in postures where the hip is flexed and the knees are extended, particularly when the multi-joint hamstring group of muscles is extended. This pose is most noticeable during the terminal range of swing phase of running or sprinting, when the hamstrings are triggered to slow down knee extension.

Poor hamstring extensibility may be thought of as a risk factor for which physical therapists can have a preventative intervention[2]. Dry needling (DN) is a procedure for treating skeletal muscle, fascia, and connective tissue dysfunction, as well as reducing or restoring impairments in body structure and function, resulting in increased activity and involvement. Dry needling is a form of trigger point therapy that can deactivate a trigger point almost instantly. Where there is a limitation of range of motion due to contracture,

dry needling is recommended[3]. Dry Needling may help to deactivate the trigger Points .Dry Needling is used when there is a reduction of range of motion due to contraction[3].

Dry Needling is usually wont to deactivate and treat myofascial trigger points. Various RCTs and general studies have looked at the effectiveness of dry needling in the treatment of MTrPs. Pain generated by myofacia is usually related to myofascial trigger points which leads to reduced range of motion and improved sensitivity to stretch. Due to the effectiveness of dry needling on connective and peri-neural tissues, when combined with stretching, the muscle & tissue can result in superior, more immediate enhancements in hamstring extensibility than stretching alone[2].

TENS (Transcutaneous Electrical Nerve Stimulation) is an electrical modality to treat for acute and chronic pain. Comparison between TENS and IFT were done and which was resulted in more effectiveness of TENS than IFT in painful conditions. Roberston and Ward found that stimulation has encountered with two effects that are increase in functional activity by increasing the strength and second is reduction in pain, conventional method is found to be best for the acute pain which is having frequency of 80-100p.p.s and which should be given at least for 30 minutes[4,5]. The literature appears to be lacking in determining the efficacy of Dry Needling and TENS in the treatment of Hamstrings strain purpose. There's need for comparative study on the results of the on top of mentioned modalities.

Material & Methods: The present study is Experimental study, Study setting was carried out in Dr.D.Y.Patil Vidyapeeth Campus, Pune, Maharashtra. Target & sample population was Footballer players with unilateral hamstring strain. Sampling method was Simple Random Sampling, Sample size was 32 (16 participants in each group)**.**

Inclusion Criteria For The Study Was: Players who are playing football since past one year, Player aged in between 15 to 23 years of age ,Minimum one trigger point on hamstring area, Hamstring strain Grade 2.

Exclusion Criteria Was**:** Skin infection, open wounds in and around hamstring area**,** Needle Phobia **,**Surgery and fracture in and around hamstring area**,** Chronic lower back pain and/sciatica**,** Uncertain diagnosis**,** Extrinsic trauma to posterior thigh. After the institutional ethical committee clearance, subject fulfilling the inclusion criteria.

The subjects were taken into study after taken there written informed concern. The following research involved 32 patients between the ages of 15 and 23 years old, who were randomly allocated to two groups of 16 patients each. Group A received Dry Needling, while Group B received Transcutaneous Electrical Nerve Stimulation.

Both participants in Group A and Group B received intervention for 15 to 20 minutes per day for a total of six days (To maintain the homogeneity of the study alternate day treatment was administered to both the group), and data were assessed pre and post operation using the NPRS (Numeric Pain Rating Scale), a pressure algometer, the FASH scale (Functional Assessment Scale for Acute Hamstring Injuries), and the Illinois agility test.

Chit method were used for segregation of sample size, group A were treated by Dry Needling and group B were treated by Transcutaneous Electrical Nerve Stimulation. Medical signs and symptoms were used to diagnosis the subject.

Subjects were briefed about the analysis prior to inclusion, and written consent was obtained from them. Both patients were initially asked about their age, weight, height and type of hamstring pain. The pain levels in both participants were then assessed. On the first day of session, the NPRS scale was used for pain assessment, A Agility was assessed by Illinois agility test.

The length of the course for the agility test was 10 meters, and the width was 5 meters. Four cones were used to mark the beginning, end, and two turning points. Four more cones were mounted down the middle, equally spaced. Each cone in the center was separated by 3.3 meters.

In between the intervention protocol, football players were forbidden from playing football match.

Results: For the statistical analysis the Mann Whitney test were used.

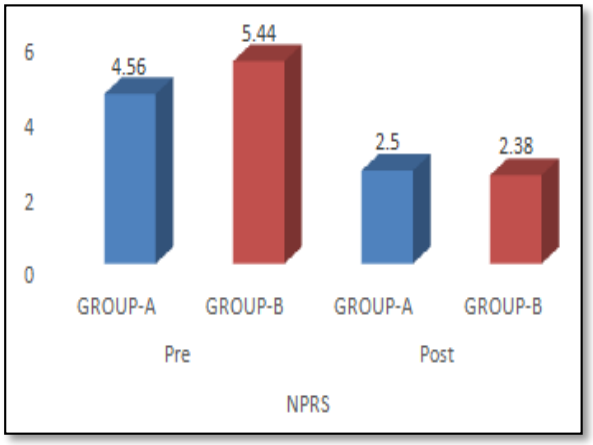
Table 1: Comparison Between The Groups, Pre And Post Scores Comparison Of NPRS, Pressure Algometer Measurements And Agility Score

Variable	Time	Group	Mean	Sd	Z-Value	P-Value
NPRS	Pre	Group-A	4.56	1.09	2.329	0.027*
		Group-B	5.44	1.03		
	Post	Group-A	2.50	0.82	0.436	0.666
		Group-B	2.38	0.81		
Pressure Algometer Measurement	Pre	Group-A	2.94	0.73	2.609	0.014*
		Group-B	3.49	0.42		
	Post	Group-A	3.58	0.71	2.786	0.009*
		Group-B	4.19	0.50		
Agility Score	Pre	Group-A	20.82	1.88	2.870	0.007*
		Group-B	19.13	1.42		
	Post	Group-A	18.55	1.20	2.441	0.021*
		Group-B	17.57	1.06		

Table 1 represents comparison between the groups, Pre and Post scores comparison of NPRS, Pressure algometer measurements and Agility score. The mean differential in Group A's Pre Treatment NPRS was 4.56, while Group B's was 5.44, indicating that Group A's score was lower.

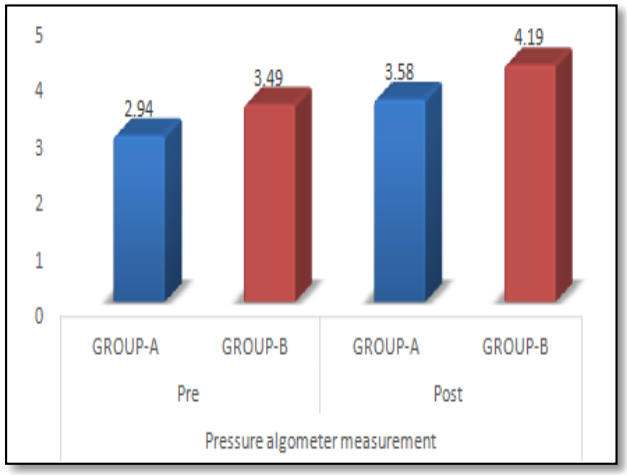
The mean difference of Post Treatment NPRS of Group A was 2.50 and for Group B was 2.38 which seems to be decreased for Group B. The mean difference in Pre Treatment Pressure Algometer Measurements for Group A was 2.94 and for Group B was 3.49, indicating that Group A had a lower mean difference. The mean difference of Pressure Algometer Measurements of Group A was 3.58 and for Group B was 4.19 which seems to be Increased for Group B. The mean difference of Pre Treatment Agility score of Group A was 20.82 and for Group B was 19.13 which seem to be decreased for Group B. Group A's mean differential in Agility score was 18.55, while Group B's was 17.57, indicating that Group B's score was lower.

Graph 1: Pre & Post NPRS Mean Score Difference



Graph 1 depicts the mean differential in Group A's Pre Treatment NPRS was 4.56, while Group B's was 5.44, indicating that Group A's score was lower. The mean difference of Post Treatment NPRS of Group A was 2.50 and for Group B was 2.38 which seems to be decreased for Group B.

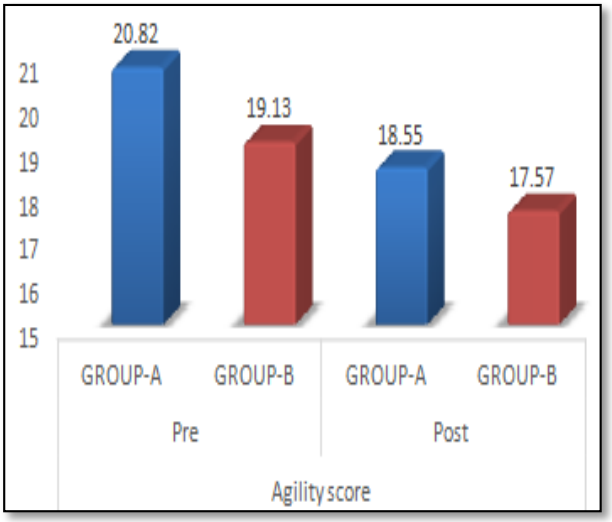
Graph 2: Pre & Post Mean Score Difference of Pressure Algometer Measurement



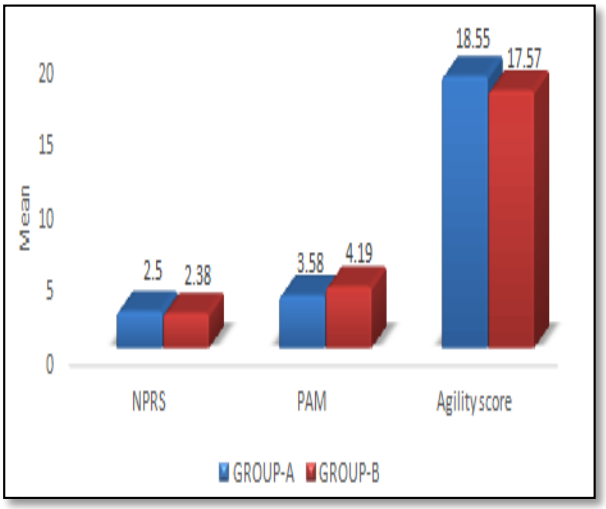
Graph 2 depicts the mean difference in Pre Treatment Pressure Algometer Measurements for Group A was 2.94 and for Group B was 3.49, indicating that Group A had a lower mean difference. The mean difference of Pressure Algometer Measurements of Group A was 3.58 and for Group B was 4.19 which seems to be Increased for Group B.

Graph 3 represents the mean difference of Pre Treatment Agility score of Group A was 20.82 and for Group B was 19.13 which seems to be decreased for Group B. Group A's mean differential in Agility score was 18.55, while Group B's was 17.57, indicating that Group B's score was lower.

Graph 3: Pre & Post Mean Score Difference Of Treatment Agility



Graph 4: Post Mean Score Comparison Of NPRS, Pressure Algometer Measurements And Agility Score



Graph 4 represents Post Mean score comparison of NPRS, Pressure algometer measurements and Agility score. The mean gap in NPRS for Group A was 2.50, while it was 2.38 for Group B, indicating a decline for Group B.

The mean difference of Pressure Algometer Measurements of Group A was 3.58 and for Group B was 4.19 which seems to be Increased for Group B.

Group A's mean differential in Agility score was 18.55, while Group B's was 17.57, indicating that Group B's score was lower.

Thus it can be concluded that statically both Dry Needling and TENS are competent enough to alleviate pain arising from Myofacial trigger points in the hamstring muscle, but clinically TENS is having better response in pain depletion and increase in Agility compared to Dry Needling.

Discussion: Myofascial pain syndrome is characterized by visual, mechanical, and autonomic signs that result in trigger points. A trigger point can form following an initial injury to a muscle fiber. The trigger point triggers muscle or muscle fiber pain and tension. It is a hypersensitive palpable nodule in the taut band that is connected with a hyperirritable spot in the skeletal muscle. Stretching or contracting a muscle caused by a trigger point causes acute discomfort, and the body attempts to shield it by a process known as splinting.

The dissertation aimed to compare the effectiveness of Dry Needling and Transcutaneous Electrical Nerve Stimulation (TENS) in the treatment of hamstring strain in football players .In this study, Group A i.e. treated with Dry Needling and Group B i.e. treated with TENS both the groups were treated for 6 session on alternate days for 10-15 minutes, Both groups showed beneficial effect in pain alleviation but clinically patients were satisfied with TENS after the treatment of Hamstring strain in football player.

Dry Needling was given with 40mm needle and TENS was given with power output of 80-100 p.p.s and pulse duration of 100-200. Patients were assessed pre treatment and post treatment with Pressure Algometer, NPRS and Agility score in Group A as well as in Group B. Both the groups showed statistically significant improvement on pain and increase in functional abilities but TENS shows better improvement in pain reduction, pain threshold and agility score in the football players with unilateral hamstring strain. As Dry Needling is an invasive procedure after the treatment it damage to the place which causes additional damage to the cell. It causes wound to that particular area which require time to heal due to which the muscle goes into the fibrotic changes and this is the main cause that Dry Needling is administered in alternate day fashion.

To maintain the homogeneity of the study the TENS is given on alternate days during the treatment session.

Electrophysiological suggestions provide a solid cohesive foundation for the use of TENS to alleviate pain, and its extensive use is backed by 100 clinical trials. Electrical currents are delivered through the skin during TENS to activate a low threshold peripheral afferent nerve that

transmits non-noxious information. This non-noxious afferent feedback mediated by TENS results in synaptic suppression of nociceptive cell activation in the central nervous system[6].

The fact that needling of local myofascial trigger points caused a brief contraction of muscle fibers in all patients, which is known as local twitch response of muscle bands and induces a normal soreness in the treated area for several hours, suggests that DN of local myofascial trigger points was not effective in reducing pain. This soreness can exacerbate the original discomfort and may have influenced patients' ratings during treatment in our research[7].

The pain gate effect on both A delta and C fibers in the posterior horn is caused by mechanoreceptor stimulation (A beta fibers).

There is morphine impacts on c fibers system this is due to produce by interneurons in the posterior horn which have been stimulated by A delta pain receptor fibers and due to which the analgesics effect is achieved by the application of TENS[8].Thus it can well concluded that Both Dry Needling and TENS have beneficial effect in alleviation but TENS shows better improvement in pain and functional abilities than Dry Needling.

Conclusion: Thus it can be concluded that statically both Dry Needling and TENS are competent enough to alleviate pain arising from Myofacial trigger points in the hamstring muscle, but clinically TENS is having better response in pain depletion and increase in Agility compared to Dry Needling.

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