

## Original Research Article

# Immediate and delayed effect of dry needling in musculoskeletal disorders: a quasi experimental study

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## ABSTRACT

**Background:** The roles of physiotherapists in managing the chronic and acute pain in musculoskeletal (Msk) conditions are inevitable now days. Physiotherapists work across the time period aiding patients with their pain in medical care settings with the aim of decreasing pain, rising quality of life wherever attainable and preventing acute and sub-acute painful conditions developing into chronic pain. Dry needling, an invasive technique in the hand of Physios is a new trend in managing acute and chronic pain. Purpose of the study is to identify the immediate and delayed response of pain and presence of soreness after the dry needling in common Msk conditions which can be managed in association with other conventional physical therapy techniques. Objective was to find out the immediate and delayed effects of dry needling over pain in musculoskeletal disorders.

**Methods:** This study was carried out in the department of physiotherapy, Malabar medical college hospital and research centre. Patient was prepared and identified the extreme tender point over the muscle affected and needle removed after 3-5 twitch response elicited. Sterility of the treatment area and needle was well maintained. Prior to the treatment again confirmed with the NPRS score and procedure was done. After few seconds of insertion of needle subjects NPRS score assessed. After removal of needling pain score was assessed after 5 mins, 30 mins, 1 hour and after one day.

**Results:** Study showed a marked reduction in pain after dry needling at each intervals and this suggesting promoting dry needling as an adjunct to pain relief technique in physiotherapy.

**Conclusions:** Dry needling is effective over pain in musculoskeletal disorders.

**Keywords:** Dry needling, Pain, Musculoskeletal disorder, NPRS, Trigger point

## INTRODUCTION

Pain is a new area of scientific interest with exponential growth in the past few years. The roles of physiotherapists in managing the chronic and acute pain in musculoskeletal (Msk) conditions are inevitable now days. Physiotherapists work across the time period aiding patients with their pain in medical care settings with the

aim of decreasing pain, rising quality of life wherever attainable and preventing acute and sub-acute painful conditions developing into chronic pain.

Physiotherapists will apply a bio-psychosocial approach with inter-professional collaborate practices and facilitate the information and skills necessary for folks to self-manage their pain. With extra coaching and skill in pain

sciences, serves as a part of multidisciplinary pain groups to help people with complicated chronic pain to enhance their quality of life by increasing their level of activity and participation in their community.

The incidence of musculoskeletal pain varies from 21% - 85% among individuals with sedentary life style.<sup>1</sup> Exercises, thermotherapy, cryotherapy, ischemic compressions, stretch and spray techniques, manual therapy, acupuncture, LLLT, local injections and pharmaceutical treatments are used for the treatment of pain associated with trigger points.<sup>2</sup>

Dry needling, an invasive technique in the hand of Physios is a new trend in managing acute and chronic pain. There are several randomized clinical trials and a systemic review which states the effect of injections with different substances and DN in treating trigger points, shows similar effects.<sup>3-5</sup> Purpose of the study is to identify the immediate (immediate after dry needling, after 5 mins, after 30 mins and after 1hour) and delayed (after one day) response of pain and presence of soreness after the dry needling in common Msk conditions which can be managed in association with other conventional physical therapy techniques.

**METHODS**

Ethical and patient consent was taken prior to the treatment with dry needling and also explained the procedure of dry needling, its potential effects and risk factors to the subjects those who were treated. This study was carried out in the department of physiotherapy, Malabar medical college hospital and research centre.

Common conditions treated with dry needling during the study was tennis elbow, golfer’s elbow, coccydynia, plantar fasciitis, thoracic outlet syndrome due to cervical rib, low back ache both discogenic and non discogenic, fibromyalgia, torticollis and cervicogenic headache (trapezial spasm). 48 subjects were participated in the study and by using Numerical pain rating scale (NPRS) pain was assessed prior to the treatment, immediately after dry needling, after 5 mins, after 30 mins, after 1 hour and after one day.

**Procedure of dry needling**

Patient was prepared and identified the extreme tender point over the muscle affected and needle removed after 3-5 twitch response elicited. Sterility of the treatment area and needle was well maintained. Prior to the treatment again confirmed with the NPRS score and procedure was done. After few seconds of insertion of needle subjects NPRS score assessed. After removal of needling pain score was assessed after 5 mins, 30 mins, 1 hour and after one day.

Statistical analysis was done by using SPSS Ver 21.0. The data was normally distributed so frequencies, mean

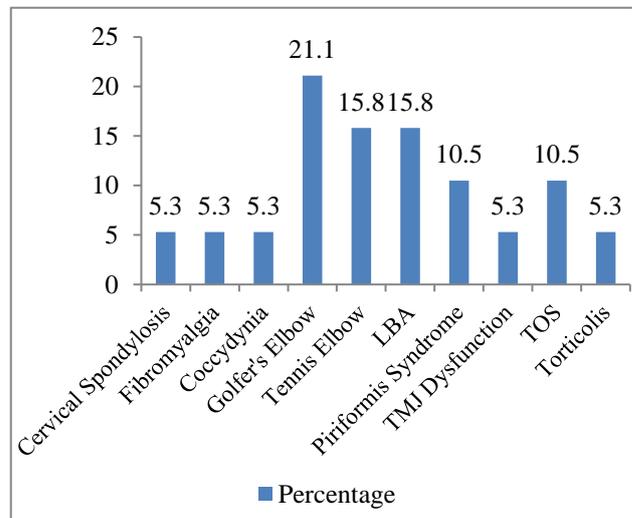
and standard deviation were used for descriptive statistics. Descriptive statistics were done for basic characteristics of the pain population for age, gender and presence of soreness. Inferential statistics by using repeated measures of ANNOVA-Greenhouse Geisser effect were done for the time bound pain evaluation. P value less than 0.05% probability was considered as statistically significant.

**RESULTS**

Demographic features of the experimental groups are summarized in Table 1. Frequency distributions of different musculoskeletal conditions treated with DN are graphically expressed in Figure 1.

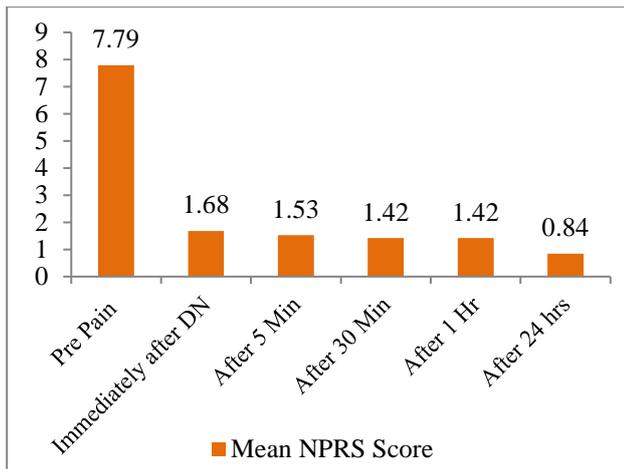
**Table 1: Frequency distribution of age, gender and soreness after DN.**

Variables	Classes	Percentage
Age	19-30	32%
	31-40	36%
	41-50	21%
	> 50	11%
Gender	Females	42.1%
	Males	57.9%
Soreness after 24 Hrs	Present	78.9%
	Absent	21.1%



**Figure 1: Frequency distribution of musculoskeletal conditions (N=48).**

In this study, 32% of subjects was having age in between 19 and 30 years, 36% of subjects was in between 31 and 40 years, 21% of subjects was in between 41 and 50 years, and 11% of subjects was having age more than 50 years. Among the population 42.1% was females and 57.9% was males. Mean pain score using Numerical Pain Rating Scale (NPRS) are expressed according to the pain before to the DN, immediately after and pain after intervals in Figure 2.



**Figure 2: Mean pain score.**

The mean pre score of pain was 7.79, mean pain score immediately after DN was 1.68, mean pain score after 5 min was 1.53, mean pain score after 30 min was 1.42, mean pain score after 1 hour was 1.42 and mean pain score after 24 hours was 0.84.

This study also reveals the presence of soreness after dry needling. 78.9% was having soreness after 24 hours of DN, and 21.1% subjects not reported any signs of soreness.

Table 2 shows tests of within-subjects effects tells there was an overall significant difference between the means at the different time points. A repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean NPRS concentration differed statistically significantly between time points.

**Table 2: Tests of within- subjects effects.**

Source		Type III Sum of Squares	df	Mean Square	F Value	Significance
Time	Greenhouse-Geisser	658.395	1.445	455.626	128.669	0.000

**DISCUSSION**

This study was conducted to find out the effectiveness of DN in pain reduction over various clinical pathologies. Sterling et al. researched the efficiency of DN in chronic whiplash patients and found that combines DN with exercises was superior effect than an exercise alone.<sup>6</sup> Huguenin et al, monitored the effect of dry needling on gluteal muscles in athletes with posterior thigh pain, and they failed to get positive impact between dry needling and other placebo effects.<sup>7</sup> Goddard et al, needled either trigger points or control points and they found similar outcomes as our study.<sup>8</sup>

DN methods were imperiously invented to treat musculoskeletal pains and widely used after Lewit’s publication.<sup>9</sup> Their study stated that the effect of injections was primarily due to the mechanical stimulation of trigger points with the needles. In this approach, the needle is inserted directly on to trigger points and thin needles are preferred in order to achieve at most analgesic effect by pricking them into the most noxious point.<sup>10,11</sup>

We have observed the dramatic decline in NPRS score after dry needling due to efficient stimuli given over the painful points. Overall, concordantly to the relevant studies.<sup>12,13</sup> Our results have shown that dry needling is effective in reducing pain. Moreover, similar to Ceccherelli et al, our results entail that muscle afferents could be more important than skin afferents also for the transmission of analgesic signals.<sup>14</sup> Likewise, presence of

poly-modal type receptors nearby the trigger points that are responsive to mechanical, thermal and chemical stimuli by Itoh et al.<sup>15</sup> We also stating that such type of receptors stimulated by dry needling may produce stronger effect on pain modulation and impacted on our studies.

Local muscle twitch is an involuntary, localized and temporary contraction in taut band of muscles during needling on the trigger points.<sup>16</sup> Along with our researchers and some articles have recommended that local muscle twitch response following dry needling on trigger points is more likely to be effective.<sup>3,17</sup> Deeper insertion of needle passes skin, fascia and muscle layers have an upper hand over non invasive techniques. So that depth of needle penetration is important of muscle pain relief.<sup>18</sup> In our respective study, we found out that DN has significant effect in treating pain which is the key element in managing different musculoskeletal conditions. Although we have considered DN for pain management; proper therapeutic consideration should be done to deal the root cause. Only pain component was taken into consideration. We recommend conducting this study on individual musculoskeletal conditions with functional outcomes.

**CONCLUSION**

This Study concludes that a pain management program elicits a statistically significant reduction in NPRS concentration. This suggests using DN in order to reduce pain as an adjunct to physiotherapy management.

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