A Literature Review on the dry needling therapeutic effects on management of knee pain

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Abstract-  
BACKGROUND & INTRODUCTION: -  
Recently, dry needling has emerged as a popular treatment for muscular pain and impairments. While there are numerous studies detailing the benefits of dry needling for pain, few studies exist examining the effects on soft tissue mobility. Dry needling (DN) is a technique used in the management of various neuromusculoskeletal pain syndromes by inserting fine monofilament needles through the skin. The needle can be inserted to treat various tissues such as muscles, subcutaneous fascia, tendons, ligaments, scar tissue, periosteum, teno-osseous junction, peripheral nerves, and even neurovascular bundles.

METHODOLOGY:  
The originator Several electronic databases were searched for open access articles of general scientific databases including PubMed, science direct, Scopus, Web of Science, shodhganga, Google Scholar etc. Thirty seven considerable scientific studies were found related to the dry needling therapeutic effects on managements of knee pain.

RESULTS:  
Dry needling as per recent literature is the preeminent technique in case of knee pain. The intensity and NPRS score was reduced.

CONCLUSION:  
The review demonstrates moderate-quality evidence on the short-term effect of knee pain. Dry Needling is an invasive procedure for breaking taut in muscle fibers and leads to help relax muscle band to live pain free life.

Keywords:  
Dry Needling (DN), Knee Pain, Numerical Pain Rating Scale (NPRS).

Introduction:  
- Knee pain is a symptom accounting for approximately one third of musculoskeletal presentations seen in primary care. Within the Johnston County Osteoarthritis (JoCo OA) Project, the overall prevalence of knee pain was 43.3%. Patellofemoral pain (PFP) and knee osteoarthritis (OA) are probably the most common causes of knee pain symptoms of musculoskeletal origin.
Dry needling (DN) is a technique used in the management of various neuromusculoskeletal pain syndromes by inserting fine monofilament needles through the skin. The needle can be inserted to treat various tissues such as muscles, subcutaneous fascia, tendons, ligaments, scar tissue, periosteum, teno-osseous junction, peripheral nerves, and even neurovascular bundles.

The commonly used DNT involves needling the myofascial trigger points (MTrPs). MTrPs are described as hyperirritable spots present in taut bands of skeletal muscles or fascia, which produce tenderness and referred pain on compression. It is found that DNT over MTrPs produces a local twitch response, which in turn may reduce the motor end-plate noise producing a pain-relieving effect.

The DNT may also stimulate the A-δ nerves resulting in opioid release from the enkephalinergic inhibitory interneurons of the dorsal horn.

Flexibility and mobility have long been an integral part of many rehabilitation and fitness training programs for patients with non-traumatic knee pain. Muscle tightness, as it contributes to hip and knee range of motion, can limit the execution of large joint, multi-segmental movements such as squatting, lunging, and deadlifting. A decreased ability to perform these movements could potentially lead to decreased physical performance as well as increased risk of injury. Kibler suggests that where there is a deficiency in a proximal segment of the kinetic chain, changed workloads may be required in the more distal segments in order to preserve the same movement outcome at the most distal segment. If this is the case, patients presenting with overuse or overload injuries of the limbs may also experience dysfunction in more proximal segments.

**Definition:** Skilled intervention performed by a physical therapist that uses a thin filiform needle to penetrate the skin and stimulate underlying myofascial trigger points, muscular and connective tissues for the management of neuromusculoskeletal pain and movement impairments.” – American Physical Therapy Association (APTA).

Dry needling is a professed or skilled intervention that uses a thin filiform needle to pierce the skin and stimulate underlying myofascial trigger points, muscular, and connective tissues for the management of neuromusculoskeletal pain and movement impairments. Dry needling (DN) is a technique used to treat dysfunctions in skeletal muscle, fascia, and connective tissue, and diminish persistent peripheral nociceptive input, and reduce or restore impairments of body structure and function leading to improved activity and participation.

The origins of dry needling as a medical intervention are relatively recent. In the late 1930’s, Dr. John Kellgren, MD experimented with injecting a hypertonic saline solution into muscular tissue to bring about referred pain. In 1938, Kellgren published his findings in the British Medical Journal and brought attention to a number of the characteristics of myofascial pain. He suggested that pain from muscles may often refer and that pattern is specific to the muscle. He stated that tenderness could also be referred but it was not a useful diagnostic guide unless the patient winced when the tender point was palpated (this is now referred to as a “jump sign”).

Conservative treatment is the first therapeutic option for the management of people with or knee pain. However, the most appropriate treatment strategy remains unclear. In fact, different interventions including medication, exercise, manual therapy, physical activity, education, and tape are recommended, but their levels of evidence are heterogeneous. There is evidence supporting a role of the quadriceps musculature in knee pain. In fact, quadriceps weakness has been found to be a potential risk factor for development of knee pain in adolescents and adults.
MECHANISM OF DRY NEEDLING:

- The insertion of a needle into skeletal muscle tissue has been shown to stimulate A or Group III small myelinated primary afferents in the skin and muscle. These fibers are responsible for the pinprick sensation. When stimulated with needling they send impulses to the spinal cord and then they in turn activate three neural regions; the spinal cord, midbrain and pituitary which release chemical neurotransmitters such as endorphins and monoamines. These neurotransmitters then “block” the subsequent pain messages.
- The endogenous opioid group consist of leu-enkephalin, met-enkephalin, beta-endorphin and dynorphins.
- The monoamine group contains norepinephrine, serotonin (5HT), dopamine and substance P. During needling C fibers that are responsible for aching pain are also stimulated.

Safety of Trigger Point Dry Needling

Since dry needling is an invasive intervention, it is important to consider its safety. Most studies did not report the presence of any adverse event different than post-needling soreness. A recent study investigating adverse events of dry needling reported that most adverse events are categorized as minor with the top three adverse events being bleeding (16%), bruising (7.7%), and pain during the intervention (5.9%). Nevertheless, some major adverse events can also occur, depending on the anatomical location. Some case reports have documented the presence of infection after application of dry needling. These are uncommon complications of dry needling; therefore, sterilization of the dry needling targeted area is important to minimize the risk of infection and assure proper safety of the technique. Although dry needling seems to be a safe intervention if properly applied, therapists need to be aware of the potential risks associated with its application on each body area where it is applied.

Strengths and Limitations

Although this is the first meta-analysis specifically analyzing the effects of TrP dry needling in patients with knee pain of musculoskeletal origin, the current results should be generalized within the context of its strengths and
limitations. The strengths of the current meta-analysis include a comprehensive literature search, methodological rigor, data extraction, rigorous statistical analysis, and the inclusion of only randomized controlled trials of high methodological quality. In fact, the current systematic review and meta-analysis (level 1a evidence) should be integrated into the evidence-based medicine (EBM) framework since it integrates data from randomized controlled trials (level 1b evidence) by also using grading recommendations for its conclusions. Among the limitations, the number of the included trials for knee OA or post-surgical pain was small. Additionally, dry needling interventions were applied with different dosages, i.e., sessions and frequency of application, and in different muscles, explaining the heterogeneity and imprecision of the results of some of the trials. It would be interesting to better define the interventions applied for potential replication of the treatment protocols. Therefore, the results of the current meta-analysis should be considered with caution.

Clinical and Research Implications
The current meta-analysis found low to moderate evidence supporting the use of TrP dry needling for the treatment of PFP, but not for knee OA or post-surgical knee pain; but several questions remain to be elucidated in future studies. First, most studies investigated short-term effects, with only two studies investigating longer follow-ups for each knee pain condition. Therefore, there is a clear need for randomized clinical trials examining long-term effects of dry needling, combined with exercise interventions, for knee pain conditions. The topic of a proper sham needling intervention should also be considered, since it is not possible to determine that real dry needling is superior to sham dry needling. In fact, Braithwaite et al concluded that sham needling interventions used in clinical trials are diverse, limiting the comparability of blinding effectiveness across current studies. Finally, other potential knee pain conditions, e.g., patellar tendinopathy, could also benefit from TrP dry needling; however, no clinical trial was included in the current meta-analysis. A systematic review reported that tendon dry needling improved patient-reported outcome measures in individuals with tendinopathy; however, this review only included four studies and none on patellar tendinopathy. The recent review conducted by Mendonça et al found one study showing a potential positive effect of dry needling in patients with patellar tendinopathy, but this study was excluded from our analysis because the needling intervention was combined with another injection therapy.
Fig. 0.4 Show Pathology of DN
CONTRAINDICATION

- Patients with needle phobia.
- Patients with Idiotic Phobia.
- Unable to give consent-communication and cognitive.
- Medical emergency conditions.
- Infections like- s le, cellulitis & other infections.
- Abnormal bleeding tendency.
- Vascular disease
- Age related factor

Materials and Methods:
STUDY DESIGN: Narrative Study/Literature Review
SOURCE OF DATA: Google scholar, CINAHL, Cochrane literacy, SCOPUS, Shodhganga, PuBMed, Research Gate & Academia.

INCLUSION CRITERIA:
- The language of publication is English.
- The publication is published in journal of physiotherapy and science direct.
- Protocol only for Knee pain.
Dry Needling techniques included.

**EXCLUSION CRITERIA:**
- The language of publication is not any-other.
- The publication is not an article in a peer-reviewed journal.
- No Other then Knee pain cases.
- Adjunctive approaches.

**Results and Discussion:**
Dry Needling technique as per recent literature is the best techniques in case of Knee pain. The intensity and NPRS score was reduced. The objective of this meta-analysis was specifically to investigate the effects of TrP dry needling for the management of knee pain conditions. We found low to moderate evidence suggesting a positive effect of TrP dry needling for pain and related disability, in patients with knee pain. Preliminary evidence has suggested a potential positive effect of dry needling for the treatment of musculoskeletal pain in the lower extremity. however, these reviews only included a small number of studies on knee pain. More high-quality trials investigating long-term effects are clearly needed.

**Conclusion:** Dry Needling is an invasive procedure for breaking taut in muscle fibers and leads to help relax muscle band to live pain free life.
Based on the results of individual randomized controlled trials included and on the overall effect size derived from the current meta-analysis, we recommend (moderate evidence) the application of TrP dry needling as compared to other treatments for short-term reduction of pain in individuals with knee pain of musculoskeletal origin. The meta-analysis revealed that TrP dry needling was effective for decreasing pain in PFP, but not with in knee OA or post-surgical knee pain.

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**REFERENCES:**


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