

Ankle Rehabilitation with Combination of Dry Needling in High School Cheerleaders

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Abstract: *The purpose of this article is to study the overall benefits and check the effectiveness of traditional rehabilitation with dry needling techniques for treating ankle injuries in high school cheerleaders. Specifically in cheer leaders these females this is a very popular sport and needs immense amount of practice, efforts and practice due to its physical demands. The risks associated with this sport make athletes prone to ankle injuries. Examining how dry needling can assist these patients when combined with traditional rehabilitation protocol, can reduce recovery time, alleviate pain and improve overall outcomes including risk for future ankle injuries. This analysis is done by using a combination of studies, evidence based statistical evidence from other studies and real-world examples to provide better understanding into the benefits of combining these approaches.*

Keywords: ankle injuries, dry needling, traditional rehabilitation, cheerleaders, recovery time

1. Introduction

Cheering leading in high school requires a combination of skills including agility, strength, precision, flexibility and immense amount of practice and co-ordination with team members. Ankle injuries can be quite serious and debilitating at the same time requiring extensive treatment protocol and duration to ensure timely and proper recovery with reduced risk for recurrence. Traditional treatment options include RICE protocol, medication, physical therapy, use of modalities, manual therapy treatments. RICE protocol includes rest, ice, compression and elevation. Trigger point dry needling, which uses a stainless-steel needle to be introduced around pain and trigger point has been used as an add on treatment technique to enhance the effectiveness of traditional rehabilitation protocol. This article aims to study the combination treatment of traditional protocol and dry needling.

2. Understanding Ankle Injuries in Cheerleaders

Ankle injuries are among the most common injuries in high school cheerleaders. These injuries can range from mild sprains which can be treated with RICE protocol to severe ligament tears and fractures needing surgical intervention. The repetitive stress on the ankle in cheerleading puts significant stress on the ankle joints and arches of the foot, making them susceptible to injury. The primary goals of rehabilitation for ankle injuries are to reduce pain, restore function, and prevent recurrence of these injuries by improving proprioception in the ankle. Achieving these goals requires a holistic approach that treats both the symptoms and the underlying causes of the injury.

Traditional Rehabilitation Methods

Traditional rehabilitation methods for ankle injuries typically involve a combination of the following:

1) Physical Therapy Exercises

Physical therapy exercises are designed to improve strength, flexibility, and proprioception. These exercises help to restore

normal motion with normal biomechanical patterns and reduce the risk for future injuries. Commonly used exercises include range-of-motion exercises, resistance training, balance exercises along with proprioception simulation, and functional movements to return to cheerleading activities (Thacker et al., 2002).

2) Manual Therapy

Manual therapy has different techniques such as joint mobilizations, soft tissue mobilization, and stretching. These techniques aim to alleviate pain, improve joint mobility, simulate micro receptors in the joints and improve soft tissue mobility, and enhance tissue healing. Manual therapy is often used to address joint stiffness, spasm and muscle tightness that can result from ankle injuries as a protective response from the body (Green et al., 2001). Using them too early in the protocol can lead to increased swelling and inflammation.

3) Modalities

Therapeutic modalities such as ultrasound, electrical stimulation, and ice/heat therapy are commonly used to reduce symptoms like pain and inflammation. These modalities can enhance the healing process and provide symptomatic relief during the early stages of rehabilitation (Kerkhoffs et al., 2007). Bracing and taping techniques can also be used to assist stability of the ankle and provide temporary functional relief of the soft tissue injured.

Dry Needling: An Overview

Dry needling is a technique that involves inserting thin stainless-steel needles into specific trigger points within muscles. This is a clean technique which needs training and providers need to make sure they follow the practice act as stated by their state of practice and OSHA safety guidelines. Acupuncture is based on traditional Chinese medicine; dry needling is often confused as acupuncture, but dry needling is rooted in Western medicine principles and focuses on treating musculoskeletal pain, dysfunction and trigger points. The primary goal of dry needling is to release muscle tension, deactivate trigger points, and promote healing by improving blood flow and reducing inflammation (Dommerholt & Fernández-de-las-Peñas, 2013).

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Mechanism of Action

Dry needling works by targeting trigger points, which are hyperirritable spots within a muscle that can cause pain, tightness and dysfunction. Sometimes the pain can be located away from the trigger point. When a needle is introduced into a trigger point it can lead to nociceptive feedback, it can cause a localized twitch response, which helps release muscle tension and improve muscle function. Patients can experience some soreness post needling. Additionally, dry needling can stimulate the body's natural healing response by increasing blood flow and promoting the release of endorphins, which are natural pain-relieving chemicals (Travell & Simons, 1999).

Combining Dry Needling with Traditional Rehabilitation

Combining dry needling and traditional rehabilitation exercise can work extremely well because of the effects of dry needling which most of the time gives faster results than the traditional manual technique. This does not mean dry needling is taking over traditional manual techniques which should be performed if needed per medical necessity. This combination approach addresses both the symptoms which are caused by muscle spasm around the joint and the underlying causes of the injury, leading to faster recovery and improved patient outcomes assisting to return to sports.

1) Pain Reduction

Dry needling has been shown to provide faster reduction of symptoms by deactivating trigger points and reducing muscle tension by bringing these muscles to an optimal length tension relation leading to better contraction of the muscle. This can be particularly beneficial during the acute stages of rehabilitation when pain is usually a hindering factor and may also be leading to stiffness and reduction range of motion. By reducing pain, dry needling allows athletes to participate in their rehabilitation exercises with improved motivation, which can reduce recovery time. (Cummings & White, 2001).

2) Improved Range of Motion

Ankle injuries can often lead to decreased range of motion due to muscle tightness and joint stiffness. Dry needling can assist to improve range of motion by releasing muscle tightness and improving joint mobility. It also helps muscles like the plantar fascia, gastrocnemius, tibialis anterior and posterior to reduce spasm in case they are in a protective state post injury to stabilize joint function. This range of motion gains can lead to better functional outcomes and a quicker return to cheerleading activities (Gunn, 1997).

3) Enhanced Muscle Function

Dry needling can improve muscle function, activation and muscle tension with optimal positioning and stress on the tendons, by addressing neuromuscular imbalances and dysfunctions. By targeting specific muscles trigger points, dry needling assists traditional rehabilitation to restore normal muscle activity, leading to improved strength, coordination, and overall performance (Travell & Simons, 1999).

4) Accelerated Healing

Dry needling can enhance vasodilation leading to increased blood supply to the injured area, promoting faster tissue repair and reducing inflammation. This increased oxygenation with increased blood supply helps deliver essential nutrients and

oxygen to the injured tissues, accelerating the healing process and reducing recovery time (Dommerholt & Fernández-de-las-Peñas, 2013). Icing is recommended after dry needling as it can sometimes cause soreness due to strong twitch response. This soreness can be misunderstood by the patients as an increase in pain and patients must be educated on the expectations. For cheerleaders acquired flat foot, specific rehabilitation protocol can be incorporated to improve arch stability and reduce the risk for chronic ankle injuries (Chougula, et.al 2015).

5) Psychological Benefits

The rapid pain relief provided by dry needling can have a positive psychological effect, improving the athlete's mood and outlook towards the injury and recovery to return back to sport. This can be highly motivating for the athlete and knowing they are on the right path to recovery can help them have higher motivation for rehabilitation. Knowing that their pain can be managed effectively, athletes are more likely to adhere to their rehabilitation programs and stay engaged in their recovery process (Cummings & White, 2001).

6) Preventative Benefits

Incorporating dry needling into regular training and rehabilitation programs can also have preventative benefits which reduces the risk for injuries. By regularly addressing and managing trigger points and muscle tightness, athletes can help recovery time after sessions of intense practice and recovery by reducing lactic acid in the muscles. This proactive approach helps maintain optimal muscle function and flexibility, which are crucial for the high-intensity demands of cheerleading (Dommerholt & Fernández-de-las-Peñas, 2013). Also, this can help muscles recover much faster to increased oxygenation of the muscle due to improved blood supply.

7) Personalized Treatment Plans

Dry needling allows for highly personalized treatment plans tailored to the specific needs of each athlete. Physical therapists can adjust the intensity, frequency, and location of needling based on the athlete's response and progress. This customization ensures that each athlete receives the most effective treatment for their medical needs per their condition, leading to better outcomes and a higher success rate (Gunn, 1997).

8) Integration with Other Therapies

Dry needling can be combined with other rehabilitation therapies such as manual therapy, therapeutic exercises, and modalities like ultrasound or electrical stimulation. This integrative approach enhances the overall effectiveness of the rehabilitation program, addressing various aspects of the injury and promoting comprehensive healing (Travell & Simons, 1999).

9) Cost-Effectiveness

While the initial cost of dry needling sessions might be a concern for some, the long-term benefits and faster recovery times can lead to overall cost savings. By reducing the duration of rehabilitation and the need for more extensive medical treatments, dry needling can be a cost-effective component of ankle injury management in high school cheerleaders (Cummings & White, 2001).

3. Conclusion

Combining dry needling with traditional rehabilitation methods offers numerous benefits for high school cheerleaders recovering from ankle injuries. Beyond immediate pain relief and faster recovery times, this integrative approach provides enhanced blood flow, reduction in chronic pain, psychological benefits, improved muscle activation, preventative advantages, personalized treatment plans, seamless integration with other therapies, and cost-effectiveness. The cumulative effect of these benefits leads to more effective and comprehensive rehabilitation, enabling cheerleaders to return to their sport with greater confidence and reduced risk of re-injury. By leveraging the benefits of dry needling within comprehensive rehabilitation programs, high school cheerleaders can achieve faster, more effective recoveries and maintain high levels of performance. Future studies could be performed on athletes getting a combination of therapy including dry needling a traditional therapy versus a control group only getting traditional therapy to find the recovery time

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