The Effects of Dry Needling Combined with Conservative Treatment and Fitness on College-Aged Athletes with Rotator Cuff Pathology

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Abstract

Rotator cuff injuries are one of the most common shoulder injuries in adults, making college athletes a high risk according to Athwal and Armstrong (2010).

Purpose

The purpose of this study was to analyze acute and chronic effects as a result of dry needling integrated with conservative treatment and fitness implementation on rotator cuff pathology in college-aged athletes.

Hypothesis

It was hypothesized that conservative treatments combined with fitness and the dry needling technique will yield the most increase in ROM and most decrease in pain of the rotator cuff as opposed to non-conservative treatments.

Methods

Thirty subjects (N=30), fifteen males and fifteen females between the ages of 17-23 (mean = 20) were participants in this study. Subjects were from various colleges and universities in North Carolina, had to meet specific inclusion criteria, and had to be diagnosed with myofascial trigger points in the shoulder region. Each participant had to complete an informed consent form before beginning the study. Three groups were used in this study for a total of six weeks. The group to receive physical therapy only was the control group. The other two groups consisted of, (1) dry needling only, and (2) dry needling with physical therapy combined. The VAS and DASH were methods used to determine the outcome of pain and disability. After the six weeks of treatment, multiple follow-ups, up to a year, were completed.

Key Terminology

Rotator Cuff

The muscle bellies and tendons of the supraspinatus, which functions as an abductor until reaching approximately 30 degrees, the infraspinatus, which functions as an external rotator, and the teres minor, which functions as an external rotator, and the subscapularis, which functions as an internal rotator. All these anatomical structures surround the glenohumeral joint to add stability.

Rotator Cuff Pathology

Rotator cuff pathology is a common condition that is classified as a spectrum that ranges from tendinopathy to tears of the musculature **May & Garmel (2021).**

Dry Needling

The use of inserting a very thin needle into the myofascial trigger points (MTrPs) of muscles, ligaments, tendons, subcutaneous fascia, scar tissue, peripheral nerves, and neurovascular bundles to manage neuromusculoskeletal pain and swelling.

Conservative Treatment

Any form of intervention, modality, or treatment that is used to prevent and/or preserve the body from forms of invasive measures such as surgery.

VAS

The Visual Analog Scale, used to measure feelings or attitudes toward injuries, disorders, research, and social science investigations. The "visual" term in VAS is concrete, which is what makes it possible to measure qualitative characteristics.

DASH

The Disabilities of the Arm, Shoulder, and Hand, is a 30-item self-administered questionnaire that rates disabilities and symptoms in the upper extremity from a score of 0 to 100.

Review of Literature

Tejera-Falcón and colleagues (2017)
Completed a study where dry needling was proposed to help in the treatment of patients with shoulder issues combined with regular injury protocol. It also used the VAS as an outcome measurement while completing final assessments at one week, one month, three months, and six months following treatment.

Tekin and colleagues (2012)
Found that dry needling was an effective technique in aiding the healing process of individuals with myofascial region pain when compared to a sham treatment.

Pai and colleagues (2021)
Found that subjects who presented chronic shoulder pain and who were treated with dry needling, rather than sham treatment, had a significant improvement in their pain intensity.

Rha and colleagues (2012)
Compared platelet-rich plasma injections and dry needling to see which would work better to reduce pain in individuals with rotator cuff pathology. Both were beneficial to symptom relief, but PRP injections speed up healing faster due to the coagulative properties the platelets provide. Dry needling is also a good treatment option because it stimulates blood flow and healing.

Saylor-Pavkovich (2016)
This study used exercises combined with dry needling to see if pain and function of the shoulder joint could be improved in patients with rotator cuff tendinopathy. Significant improvements were made in pain and disability via the outcome measurements – the VAS and the DASH.

Arias-Buría and colleagues (2015)
Compared dry needling with physical therapy in people that had shoulder surgery to individuals that had shoulder surgery and physical therapy. Subjects were examined for active trigger points in the upper trapezius, infraspinatus, supraspinatus, and medium deltoid muscles by a clinician. The findings of this study suggest that dry needling, combined with physical therapy, may speed up the healing process.

Methodology Timeline

Baseline
- Informed Consent Completed
- Initial VAS and DASH Completed

Week 1 – Week 6 Group I
- Physical Therapy Only - Control Group
- Three Physical Therapy Sessions Per Week
- VAS Completed After Each Session
- DASH Completed Once Per Week

Week 1 - Week 6 Group II
- Dry Needling Only - Experimental Group
- One Dry Needling Treatment Per Week
- VAS Completed After Each Session
- DASH Completed Once Per Week

Week 1 - Week 6 Group III
- Dry Needling Combined with Conservative Treatment & Fitness - Experimental Group
- Three Physical Therapy Sessions Per Week
- One Dry Needling Session Per Week
- VAS Completed After Each Session
- DASH Completed Once Per Week

Follow-Up Protocol VAS and DASH Completed
1 Week
1 Month
3 Months
6 Months
1 Year

Findings Analyzed & Data Terminated

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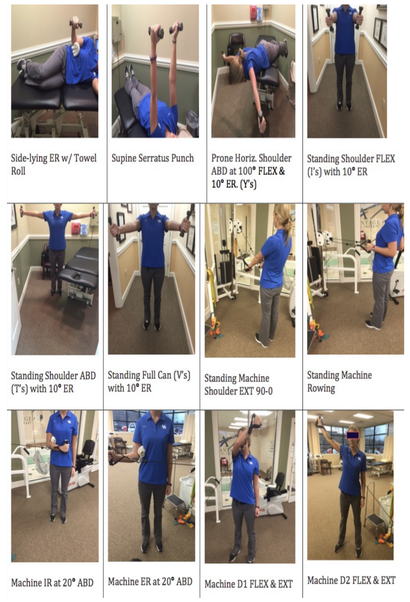
Exercise Protocol



Needle Placement Protocol

Acknowledgments

I would like to thank Dr. Hartman for supervising and overseeing this research proposal and providing helpful feedback. I would also like to thank my peers for aiding me through revisions and editing.

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