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Case Report

Physiotherapy Section

Treating Shoulder Pain with Trigger Point Dry Needling: A Case Report

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ABSTRACT

Shoulder pain is highly prevalent even in the young population and could have a multifactorial aetiology. Myofascial Trigger Points (MTrPs) could be one of the pathophysiological basis of shoulder pain. Dry needling has shown promising results in releasing MTrPs in different muscles. Hereby, authors present a case report of a 24-year-old male with a history of shoulder pain, with no history of trauma or injury, who was referred to the physiotherapist by orthopaedic surgeon with a diagnosis of shoulder strain of muscular origin. Being a flight attendant by profession, his job involved continuous picking, pushing and lifting things during his working hours in the flights. The patient presented with severe pain and with reduced Range of Motion (ROM) mainly on left side. Following thorough assessment of the patient by the physiotherapist, the trigger point dry needling was administered. The pain was reduced as measured by Numeric Pain Rating Scale (NPRS), increasing the Pain Pressure Threshold (PPT) as measured by algometer with increase in ROM of left shoulder. After the dry needling treatment session, there was an instant improvement in the restricted ROM of shoulder which may be a consequence of the decrease in pain and improvement in muscle tone and elasticity after treatment. Although there are few papers highlighting the effectiveness of dry needling but still, there is dearth of literature that highlight the quantification (PPT) in addition to reporting of pain (score based) and ROM. Thus, the results of the present case report can assist in providing insight for examining the effectiveness of dry needling, which are subdued literature but are important to frame body of knowledge.

Keywords: Pain pressure threshold, Rotator cuff muscles, Shoulder range of motion, Shoulder strain

CASE REPORT

A 24-year-old male patient reported to the Physiotherapy Clinic with shoulder pain since last one week with high score of Numeric Pain Rating Scale (NPRS). The patient had no history of any surgery, trauma or injury and was referred to physiotherapist by orthopaedic practitioner with a diagnosis of shoulder strain of muscular origin. There were no signs of inflammation and patient reported pain on rotator cuff muscles of left shoulder region with difficulty in moving his left shoulder above. The patient mentioned that the pain aggravated on lifting and overhead activities of left shoulder joint and relieved by taking rest and supported movements of left shoulder joint. He was a flight attendant by profession, and his job involved continuous picking, pushing and lifting things during his working hours in flights.

The rotator cuff muscles of left shoulder were found tender on palpation which was scored 9 on NPRS and intensity of pain was 10.5 N as measured by digital algometer (model ALGO D-01). The patient complained of pain during posterior palpation over infraspinatus muscles inferior to left scapular spine level, reported increase in shoulder pain with active abduction and external rotation of the left shoulder. On evaluation, there was around 50% decrease in Active Range of Motion (AROM) at the shoulder joint while performing abduction and external rotation on the left side as compared to the right side as measured using goniometer (model National G-360). The area of tenderness and Myofascial Trigger Points (MTrPs) on the posterior aspect of scapula, inferior and superior regions of scapular spine were palpated and marked. The site and location used for physical examination by the therapist for palpation are mentioned in the [Table/Fig-1] [1].

Assessment	Treatment
Trigger point assessment performed on the infraspinatus muscle	Patient in prone, therapist identified the hypersensitive spot in the infraspinatus
	The overlying skin was cleansed with alcohol
	Once the needle has been inserted manually into the trigger point, the needle was pistoned in an up-and-down fashion so that 2- to 3-mm vertical motions occur (i.e., fast-in and fast-out technique as described by Hong CZ [1]) at approximately 1 Hz for 25-30 seconds, with the aim of eliciting local twitch responses
	After needle was removed, pressure with a cotton ball will be maintained to prevent excessive bleeding
	The number of sites and specific muscles treated was recorded by the therapist
Trigger point assessment performed on the teres minor	Patient in prone, therapist identified the hypersensitive spot in the teres minor
	The overlying skin was cleansed with alcohol
	Procedure as explained above
	After needle was removed, pressure with a cotton ball was maintained to prevent excessive bleeding
	As explained above
Trigger point assessment performed on the supraspinatus	Patient in prone, therapist identified the hypersensitive spot in the supraspinatus
	The overlying skin was cleansed with alcohol
	Procedure as explained above
	After needle was removed, pressure with a cotton ball was maintained to prevent excessive bleeding
	As explained above

[Table/Fig-1]: Dry needling intervention algorithm for treatment selection.

Intervention: The patient was thoroughly explained about the procedure and the informed consent form was signed prior to intervention. The area with MTrPs was cleaned and sanitised with alcohol-based chlorhexidine sanitiser and record of the sites that were to be treated was made. The single sterile needle with size of 50 mm in length and 0.25 mm in bore was used for treatment and release of trigger point. As a safety measure to avoid direct contact surgical sterile gloves were worn by the therapist during handling of the needle. The solid filiform needle was inserted in to mediocaudal direction to achieve localised muscle twitch response in the muscle as illustrated in the [Table/Fig-2]. As the needle was inserted, the twitch response was followed after which in the same position, the needle

[Table/Fig-2]: Trigger point dry needling.

was pistoned in an up and down fashion so as to achieve 2 mm to 3 mm vertical motions at approximately 1 Hz for 25-30 seconds in the single session. The needle was then removed safely and disposed in the disposal container following the biomedical waste disposal norms [2]. The total duration of intervention was less than a minute.

Outcome: Immediately following the treatment session, the patient reported a significant reduction in shoulder pain and was able to move his left shoulder in active abduction and external rotation beyond the initial range. There was a significant reduction in pain (2/10 on NPRS). Immediately following the treatment session, the shoulder Range of Motion (ROM) was measured with goniometer and there was significant increase in ROM of abduction and external rotation on left shoulder [Table/Fig-3].

Variable	Pre intervention	Post intervention	Change
Numeric Pain Rating Scale (score)	9	2	7
Pain pressure threshold (Newton)	10.5	25.5	15
Range of motion			
Shoulder Flexion	135°	145°	10°
Shoulder Extension	25°	55°	30°
Shoulder abduction	85°	145°	60°
Shoulder external Rotation	35°	80°	45°
Shoulder internal Rotation	40°	75°	35°

[Table/Fig-3]: Pre intervention and post-intervention outcome.

DISCUSSION

The case report evaluated the effect of MTrPs dry needling technique in shoulder pain patient. The subject showed reduction in intensity of the pain as reported on NPRS, and an increase the PPT as measured by algometer. In the present case report, the PPT increased by 15 N, and shoulder ROM also showed measurable improvement. Although the causes of shoulder pain are varied but there is possibility of the neuromotor alteration, weakness in the surrounding muscles and inactivation of motor patterns can contribute to impaired ROM and pain, including the formation of MTrPs [3]. Previous preliminary studies showed that dry needling helps in inducing analgesia by modulating pain and improving ROM via gate control theory or stimulation of endogenous anti nociceptive modulation system [4-8].

The dry needling application perhaps reduce the excitability of the central nervous system by decreasing the peripheral nociception related to the trigger point, by reducing dorsal horn neuron activation and by moderating pain-related brainstem areas [9]. In line with our findings, Pecos-Martin D et al., also investigated the effect of dry needling MTrPs of the lower trapezius muscle and observed a higher increase in PPT, compared with a control intervention [10]. The improvement in AROM of shoulder joint may be a related with the decrease in pain and improvement in muscle tone and elasticity post intervention [11].

CONCLUSION(S)

The use of dry needling is effective in treating MTrPs and reducing shoulder pain faster and inturn increasing shoulder ROM. The approach of dry needling techniques by physical therapists has become more prevalent, and more therapists are adopting this application, but still further researches are required to support or refute its effectiveness. The results of the present case report can enhance the initial insight for future exploring the efficacy of dry needling.

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