Title: Effectiveness Of Neurokinetic Therapy And Electrical Stimulation On Pain, Grip Strength and Disability In Trapezitis : A Case Study

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Abstract:
Purpose: Trapezius pain is the most common musculoskeletal disorder. Poor ergonomics such as excessive neck flexion, constrained working postures, excessive static and peak loading of the upper trapezius and the forearm extensor muscles all play a role in developing this Musculoskeletal disorder. This increase in neck or shoulder pain can greatly decrease the productivity and hamper functional activities. There are limited studies on neurokinetic testing for improving strength and function with help of electrical stimulation. Hence need of the study.
Methodology: A 21-year-old female student came to musculoskeletal department of physiotherapy, PMT, Loni, with chief complaints of pain in upper back since 6 months and weakness in upper back since 2 months. The patient started experiencing pain in upper back which increased gradually. She experienced pain while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements.
Intervention: The patient received Electrical stimulation following neurokinetic therapy for levator scapulae and pectoralis major muscle for 5 days a week for 2 weeks. Result: In this study we assessed the patient on Numeric pain rating scale (NPRS), Neck disability index (NDI) and Hand held dynamometer which showed significant improvement in pain by 20%, grip strength by 40% and neck disability by 20% in results. Conclusion: it is concluded that electrical stimulation following neurokinetic therapy helps in improving pain, grip strength and disability in patients with Trapezitis.

Introduction:
Trapezius pain is a classic stress pain and it is the most common musculoskeletal disorder caused by awkward occupational postures, anxiety, stress, heavy lifting, and physically demanding work.[3] 2/3rd of the general population have neck pain highest in middle age.[1] The Ratio of prevalence in males and females in India is 1:10. and 3-5% of the population is affected worldwide.[2] Mechanical neck pain is a generalized neck and/or shoulder pain with mechanical characteristics, including symptoms provoked by maintained neck postures, neck movement, or by palpation of the cervical muscles. The source of symptoms in mechanical neck pain is not completely understood, but has been purported to be related to various anatomical structures, particularly zygapophyseal or uncovertebral joints of the cervical spine. A frequently seen cause of the neck pain is awkward occupational postures, anxiety, stress, heavy lifting, and physically demanding work.[3] Janda described upper crossed syndrome as facilitation of the upper trapezius, levator scapulae, sternocleidomastoid, and pectoralis muscles, as well as inhibition of the deep cervical flexors, lower trapezius, and serratus anterior. These muscle imbalances and movement dysfunctions may have a direct effect on joint surfaces, thus potentially leading to joint degeneration. In some cases, joint degeneration may be a direct source of pain, but the actual cause of pain has been often secondary to muscle imbalance.[4] Neurokinetic Therapy is a manual muscle testing that is designed to stimulate motor control center of the cerebellum which resolves injury, stress, and pain. It works on the source of the problem by reprogramming dysfunctional movement patterns.

Case Summary
A 21-year-old female student came to musculoskeletal department of physiotherapy, PMT, Loni, with chief complaints of pain in upper back since 6 months and weakness in upper back since 2 months. The patient started experiencing pain in upper back which increased gradually. She experienced pain while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements. Pain was insidious on onset and dull aching in nature with an NPRS 8/10 while studying, using laptop and writing for long time. She experienced pain while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements. Pain was insidious on onset and dull aching in nature with an NPRS 8/10 while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements. Pain was insidious on onset and dull aching in nature with an NPRS 8/10 while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements. Pain was insidious on onset and dull aching in nature with an NPRS 8/10 while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements. Pain was insidious on onset and dull aching in nature with an NPRS 8/10 while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements. Pain was insidious on onset and dull aching in nature with an NPRS 8/10 while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements. Pain was insidious on onset and dull aching in nature with an NPRS 8/10 while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements. Pain was insidious on onset and dull aching in nature with an NPRS 8/10 while studying, using laptop and writing for long time. Later as the condition progressed she experienced pain and difficulty in maintaining posture after every 20 mins and also experienced tautness on right side on touch, stiffness and difficulty in neck movements.
distraction test negative. Score on NPRS was 9/10, score on Neck disability index (NDI) was 0.5% and score on Hand held dynamometer was 22.8kg.

### Intervention

<table>
<thead>
<tr>
<th>Duration of protocol</th>
<th>5 days /week For 2 weeks</th>
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<tr>
<td>Electrical stimulation</td>
<td>Surged faradic, duration 0.1 – 1 microsecond with a frequency of 50 Hertz for 90 contractions</td>
</tr>
<tr>
<td>Duration: -30</td>
<td></td>
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<tr>
<td>isometric workouts</td>
<td>10 repetitions with 6sec hold</td>
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### Outcome Measures

1. Numeric Pain Rating Scale (NPRS)
2. Neck Disability Index (NDI)
3. Hand Held Dynamometer

### Statistical Analysis

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<tr>
<th>Series 1</th>
<th>PRE</th>
<th>POST</th>
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<tbody>
<tr>
<td>NPRS</td>
<td>9</td>
<td>7</td>
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Result

In this study we assessed the patient on Numeric pain rating scale (NPRS), Neck disability index (NDI) and Hand held dynamometer which showed significant improvement in pain by 20%, grip strength by 40% and neck disability by 20% in results.

Discussion

Neurokinetic Therapy is a manual muscle testing that is designed to stimulate motor control center of the cerebellum the body-mind complex which resolves injury, stress, and pain. It works on the source of the problem by reprogramming dysfunctional movement patterns. The Engine Control Center (MCC) that is available in the cerebellum the data from that point ranges to Limbic Framework (Fill My Need) and afterward it goes to the cerebral cortex (Take This Course) at that point data passes (Do It) to musculoskeletal (Doing It). (Book name David Weinstock The (MCC) Engine Control Center is invigorated by muscle or capacity disappointment. "Neurokinetic Treatment (NKT) is a strategy that comprehends Engine Control Treatment which is useful in perceiving development designs", [5]

Electrical currents help in reducing the pain by assisting in the process of healing or by altering the transmission and perception of pain. [5,6] When a muscle contracts as a result of electrical stimulation, there is increased metabolism along with an increased demand for oxygen and foodstuffs also with a rise in the output production of metabolites. [7] The metabolites lead to capillary and arteriolar dilatation causing a considerable increased blood flow to the muscle. [8] This leads to removal of chemicals (metabolites) helping in reducing the level of nociceptive stimulation. [9] A study done by Fusun Ardic et al [10] concluded that Electrical Muscle Stimulation significantly improved pain in myofascial pain of upper trapezius muscle. Electrical currents lessen the degree of muscle spasm by reducing the sensitivity of the muscle spindle system which eliminates the mechanical and chemical events stimulating transmission of pain. [5,10] With the relief in muscle spasm, the ROM restricted increases. [11]

There was statistically significant improvement with Surged Faradic Stimulation in ROM on subjects having myofascial trigger points of trapezius in a study conducted by Akanksha A. Nalawade and Poonam H. Patil. [5] The result of our study for SSF Stimulation intervention is in line with the result of the research conducted by Kshama S. Shetty and A. Joseph Oliver Raj stating that Surged Faradic current has got beneficial effect in improving pain intensity and ROM on myofascial trigger point of upper trapezius.
Conclusion

It is concluded that electrical stimulation following neurokinetic therapy helps in improving pain, grip strength and disability in patients with trapezitis.

Clinical Implication

Neurokinetic therapy with electrical stimulation can be used for improving grip strength and reducing pain and disability in patients with trapezitis.

References

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3. Apoorva Phadke Effect of muscle energy technique and static stretching on pain and functional disability in patients with mechanical neck pain: A randomized controlled trial
5. Nisha girdhani et.al, effectiveness of neurokinetic therapy in mechanical neck pain patients with conditional cervical neuropathy, international journal of science and research, 2019