



Research Article

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Effect of Ischemic Compression and Infrared Radiations on Myofascial Trigger Point of Trapezius

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Abstract

Background and Objective: Trigger point is a hypersensitive spot in a taut band of skeletal muscles, it has intense pain while compression, producing movement and any alterations. Trapezius is the common muscle always develop trigger point, although various management exist in managing the trigger point still there are lot of scope in the research. So far, there are no studies on combining IRR with ischemic compression. The objective of the study was to identify the effect of ischemic compression and infrared radiation on myofascial trigger point of trapezius muscle with neck pain patients. **Material and Methods:** 60 patients were included for the study using experimental study design, they were recruited following due consideration of the selection criteria. First group is an experimental group, which receives IRR along with Ischemic compression therapy for 20 minutes. Second group is control group receives only IRR with gentle neck stretches for 20 minutes. All patient was advised to follow home advices and instructions given by the therapist through the period of the treatment. Written consent was obtained from every individual participant. The study duration was six months and the individual patient underwent 8 weeks. Study identifies two measures as an outcome, which are pain using numerical pain scale and trigger using pressure pain threshold. **Results:** Blinded assessor is used to identify the data's collected from the patient during the initial visit and at the last visit by the participant. All the collected data were analyzed using SPSS 20.0. The result of the study shows that pain scale was 9.72 ($p < 0.001$) and PPT was 12.25 ($p < 0.001$). **Conclusion:** This study concluded that ischemic compression with infrared radiation therapy in myofascial trigger point of trapezius muscle in neck pain patients and it also significantly reduces the pain as well as the Pressure pain threshold.

Keywords: Trapezius, Myofascial trigger point, Ischemic compression, Infrared radiation therapy, Pain, Pressure pain threshold.

INTRODUCTION

Myofascial trigger point is a palpable nodule in taught band of hyperirritable area in the postural muscles [1]. Main contributing factors for the trigger points are often the job stress, repetition of work-related activities, repetitive trauma, awkward posture and poor posture [2].

Scapula stabilizing muscles are more prone to have the myofascial trigger point which is about 90, referred from the literatures [3], Abnormal posture on the neck enables the neck and the scapular muscles scapular to undergo various stress on the postural muscle which may lead to myofascial trigger point [4]. Trigger points are commonly located in the areas which are prone to impair circulation and which are prone for mechanical strains like Gluteus, Levator scapule, Upper trapezius, Infraspinatus and Quadratus lumborum [5]. Many recent researchers identified that trapezius is the common muscle where trigger point arises. 6 Upper Trapezius muscle is one of the most prevalent muscle for active trigger point [6].

Common features of the trigger point include the tender bands of muscles, taut band which could produce pain while pressing it directly or sometimes spontaneous, with this there was weak muscles, sensory motor dysfunctions, changes in motor control function and disruption of normal patterns of motor recruitments are seen [7].

Various management methods for the myofascial trigger point are available which are medications, stretching, cryotherapy, massage, manual therapy and various chiropractic techniques [8]. In the recent review studies in physiotherapy there was a relief of pain found in application of trigger point pressure release and ischemic compression [9].

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Infrared radiation (IRR) is an effective superficial heat modality which helps in management of pain, spasms and stiffness. It plays a major role in healing of soft tissues and also facilitate healing process of the injuries in musculoskeletal areas [10-13]. IRR can stimulate the production of nitric oxide which enhances inflammatory response, tissue repair and is absorbed in tissues [14].

Ischemic compression (IC), is a type of compressing the painful spot, it is applied progressively, strong and painful pressure applied on the trigger point to reduce pain. IC is applied through fingers, thumb of elbow. When applying it if there is pain reduction, then the pressure should be raised up to the next level [1]. Myofascial trigger point reduces muscle pain is effectively done by ischemic compression [13].

Although this study was theoretically strong but the limited research has created barrier in identifying the effect of IRR and IC, so this study was applied to identify the effect of both the techniques on trapezius myofascial trigger point. The objective of the study was to determine the effect of ischemic compression and infrared radiation therapy on myofascial trigger point of trapezius muscle in neck pain patients.

MATERIALS & METHODS

Study was approved by Institutional ethical committee, KG Hospital, Coimbatore, India. 68 patients with myofascial trigger point of trapezius were identified and included in the study. Neck pain patient who were referred by physician to the department of physiotherapy were evaluated thoroughly by the blinded assessor to identify the patient for the study. Blinded assessor is the one who have more than 10 years of experience in soft tissue mobilization techniques and was not aware of this study, he is assessing the patient and collecting the data from each individual patient. All the selected patient were involved in the study based on the age of 22–35 yrs, both gender, having palpable taught band over the trapezius, complains of neck pain with trapezius spasm, notable jump sign positive, non-radiation of neck pain, without disc diseases, and not having pain scale over 7 in the numerical pain scale and not on any interventions currently. Patient were randomly allocated into two groups using lottery method, each

group have 34 patients in the initial phase of the study, later on there was withdrawal of the patient noted and the study completed with 30 in each group. First Group is called as experimental group where the patient receives IRR with Ischemic compression therapy for 20 minutes. Second group is also called as control group where the patient receives IRR with gentle stretch for 20 minutes. Application of Ischemic compression over the trapezius muscle trigger point for 30 seconds and followed by rest period of 60 seconds. This cycle was repeated five time (five cycles). The therapist kept predetermined constant pressure at an intensity which is comfortable for the therapist. This was applied for 3 times a week for 8 weeks. IRR applied to the patient after being tested for thermal sensation using two test tubes which contains hot and cold water in it. Trapezius area was cleaned using methylated sprit prior to IRR. The IRR kept at a distance of 65cms and was applied 3 times a week for 6 weeks. All patients were advised not to do on any strenuous exercises through the period of the treatment. General instruction about the study and the home programme was given to all the patient and their consent was obtained through writing. A copy of consent was given to the individual patient. The study duration was six months and the individual patient underwent 6 weeks. After application of the treatment the patient’s data was calculated using numerical pain scale for pain and trigger point through pressure pain threshold by the blinded assessor on the first visit as well as on the alternate weeks. Collected data were analyzed using SPSS 20.0 with the help of the statistician.

RESULTS

Data’s collected were compared and distributed in the tables given below. The study didn’t have any statistical significance in the pretest values. Demographic variables were showed in Table 1. The table 2 shows the analyses of data between the groups.

After analyzing the data both groups produce difference in the values on comparing their pre vs post data. On contrary to that, comparing the pain values and ppt between the group shows a significance in the data. The Group with Ischemic compression and Infrared radiation therapy produces a significant improvement in the pain values and the pressure pain threshold.

Table 1: Demographic Variables

	IC + IRR	IRR	p value
Age	29.9 ± 6.21	29.05 ±4.63	0.001
Gender	Male (12) 29.35 ±6.32	Male (11) 29.10 ±7.50	0.005
	Female (8) 28.81 ± 2.31	Female (9) 28.54 ±4.32	0.005

Table 2: Variable analysis using SPSS

Variables	N	Experimental IC +IRR (Mean / SD)		Control IRR (Mean / SD)		Experimental Vs Control		p value	t value
		Pre	Post	Pre	Post	IC+IRR	IRR		
Pain	20	5.15 ±0.81	0.35 ±0.60	5.20±0.41	1.30±0.55	0.35 ± 0.60	2.40± 0.60	0.0001	9.72
PPT	20	0.85 ±0.22	5.56 ± 0.94	1.22 ±0.13	3.16± 0.34	5.13 ± 0.52	3.11 ± 0.45	0.0001	10.12

DISCUSSION

This study evaluates the effect of ischemic compression and infrared therapy on myofascial trigger point of trapezius muscle in patient with neck pain. Trigger point is a hypersensitive nodule found in the trapezius muscle on the neck [1]. Head and neck muscles play a major role in maintain the neck against the gravity, the trapezius is the postural muscle which is more prone for the trigger [15]. Changes in the muscle function along with the weaker shoulder muscle contributes the neck muscles [16]. Trapezius is common muscles gets trigger point.

IC (Ischemic compression) aids to reduce the pain by application of the pressure locally, where it dilates the sarcomeres [17], and it increases the flow of blood to tissues which also enhance the drainage of cellular metabolic sub-products associated with pain production. It also aids in restoring of normal metabolic function in the affected tissues [18].

IC also cause reactive hyperemia which produced in these areas and from the spinal reflex mechanism [18] and it also promotes desensitization of the afferent fibers lead to pain relief [19]. Many studies had showed that IC lessens pain and spasms [20]. It is also an effective technique which play a major role on reducing trigger in the muscles [21, 22].

IRR (Infrared radiation) therapy manages pain by creating an analgesia through rise of temperature which cause vasodilatation of blood vessels and increases the flow of blood. Rise of blood circulation whereby heals tissue injuries by supplying nutrients and oxygen [23].

IRR also aids in nitric oxide release from hemoglobin and thereby increase in blood flow that enhance healing [14,24]. IRR increases the activity of the cells and rise of blood reduces the level of pain and reduce the metabolites like histamines and bradykinin [25].

Although there are various advantages of IRR on trigger point but there was no extensive studies done using this thermotherapy techniques [24,25]. This study findings were supported by various studies which related to this, the findings of this study show that combination of the ischemic compression with infrared radiation therapy would be benefited in reducing pain and improving the pressure threshold in trapezius trigger point. Whereas the infrared radiation therapy with stretching produces a reduced improvement in these parameters. Statistically shows that a combination of the IRR with ischemic compression would produce significant improvement. Limitations in this study includes ischemic compression force is not quantified, individual difference in the IC is not obtained.

CONCLUSION

This study has identified that ischemic compression and Infrared radiations on myofascial trigger point of trapezius muscle in neck pain patients were having significant reduction of Pain and Pressure pain threshold.

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Conflicts of interest

None.

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