



THE THERAPIST

JOURNAL OF THERAPIES & REHABILITATION SCIENCES

<https://thetherapist.com.pk/index.php/tt>

Volume 4, Issue 3 (July–September 2023)



Original Article

Immediate Effect of Ischemic Compression Therapy to Release Suboccipital Trigger Points in Tension-Type Headache among Adult Population of GCUF

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ARTICLE INFO

Key Words:

HIT-6, Ischemic Compression Therapy, Tension-Type Headache, Trigger Points, Visual Analogue Scale

How to Cite:

Ghaffar, T., Nadeem, N., Saleem, S., Ahmad, I., Ajmal, M., Javed, H., & Khalid, A. (2023). Immediate Effect of Ischemic Compression Therapy to Release Suboccipital Trigger Points in Tension-Type Headache among Adult Population of GCUF : Effect of Ischemic Compression Therapy. *THE THERAPIST (Journal of Therapies & Rehabilitation Sciences)*, 4(03).
<https://doi.org/10.54393/tt.v4i03.156>

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Received Date: 10th August, 2023

Acceptance Date: 25th September, 2023

Published Date: 30th September, 2023

ABSTRACT

Tension-type headache is a nervous illness and characterized by pain, causes stretch on both sides and stiffness which feels like a band or pressure leads to disruption in daily activities.

Objective: To see the immediate effects of ischemic compression therapy to release sub-occipital trigger points in tension type headache. **Methods:** It was a quasi-experimental study. Study population was students and faculty members of GC University, Faisalabad from age between 25 to 35 years. Sample size of the study was 35. A convenient sampling technique was used to select individuals according to the defined inclusion criteria. Trigger points were evaluated by palpating the occipital region. Data collection tools including visual analogue scale (VAS) and HIT-6 was used to measure intensity of pain and tension-type headache. SPSS version 25.0 was used to analyze the data. **Results:** Post-treatment values of VAS showed the reduction in pain intensity (mean=0.57) as compared to the pre-intervention values (mean = 5.03). A notable reduction in HIT-6 impact from (mean = 65.13) to (mean = 40.40) was observed. Paired sample t-test showed a p-value below 0.05 for both VAS and HIT-6, highlighting the positive effects of ischemic compression therapy to release sub-occipital trigger points in tension type headache. **Conclusions:** There was a notable reduction of pain intensity immediately after the treatment session. Ischemic compression therapy was significantly effective to release sub-occipital trigger points in patients with tension type headache.

INTRODUCTION

A myofascial trigger point is a hyperirritable area that is uncomfortable upon compression and can cause referred pain, motor dysfunction, and autonomic abnormalities [1]. It often exists inside a taut band of skeletal muscle. Sub-occipital muscles in the cervical musculature can produce TrPs, which cause a referred pain pattern to the side of the

head over the occipital and temporal bone [2]. Acute trauma or repeated micro-trauma can cause muscle fiber tension and the creation of trigger points. Participants may have localized, chronic discomfort that limits their range of motion in the afflicted muscles [3]. Other causes of trigger points include history of fall, stress, lack of exercise,

sedentary lifestyle, swayback posture, telephone posture, anxiety and depression [4]. Tension-type headache is a nervous illness identified by the susceptibility to attacks of mild to moderate intensity. Stress is known to be the major factor causing tension-type headache [5, 6]. It differs from migraine in various ways. Headache usually goes on from 30 minutes to seven days and mostly present on both sides of head. The intensity of headache is not severe; it ranges from mild to moderate [7]. No GIT related symptoms like nausea or vomiting can be seen in tension-type headache, these are present in migraine [8]. The present of active TrPs strongly correlates with the chronic tension-type headache [9]. Ischemic compression is a mechanical method of treating myofascial trigger points that involves applying steady pressure over a prolonged period of time to render the trigger points inactive [10]. Ischemic compression is carried out by applying pressure to the trigger points with a level of pain that is manageable using a pressure algometer or thumb pressure, and simultaneously increasing compression intensity as the level of pain lowers [11, 12]. Muscle lengthening should occur after ischemic compression. Ischemic compression induces localized ischemia in the muscle, which is then followed by reperfusion once the process is over [13]. Due to the analgesic, circulatory, muscular relaxation, and functional benefits of the ischemic compression approach, which is also simple to use, affordable and produces more rapid & effective outcomes than traditional physiotherapy [14, 15]. Togha M *et al.*, conducted a randomized trial including 29 females having cervicogenic headache related to myofascial trigger points in sternocleidomastoid muscle. The aim of that trial was to compare the effects of ischemic compression and dry needling in treatment of headache symptoms and in features related to myofascial trigger points. Subjects were randomly divided into three groups; one dry needling, second ischemic compression and a control group. 4 treatment sessions were given to ischemic compression and dry needling groups. Results revealed that both therapies were equally effective in treating headache symptoms as there was no difference between both groups ($P > 0.05$) in significant improvement of intensity, pain thresholds, duration frequency of headache and myofascial trigger point area ($p < 0.05$). Conclusion revealed that reduction in symptoms of headache occurred for both ischemic compression and dry needling therapies during small period of 4 treatment sessions but ischemic compression might be preferred because of its non-invasive nature [16]. Although, previously various studies are published on the beneficial effects of ischemic compression therapy but there was a very limited literature available on the therapeutic effects of Ischemic

compression therapy on sub-occipital trigger points in tension-type headache (TTH). Therefore, the purpose of the study was to evaluate the immediate impact of Ischemic Compression Therapy on the Sub-occipital trigger points, in students and faculty members of Government College University Faisalabad suffering with tension-type headache (TTH). The finding of this research will be helpful in developing more targeted treatment approach for the patients of tension type headache.

METHODS

It was a quasi-experimental study conducted at the Government College University Faisalabad. Sample size of the study was 30, which were calculated through open epitool software with margin of error as 5% and 95% confidence level. The duration of the study was 5 months, from January 2023 to June 2023. Inclusion criteria of the study were students and faculty members of GC University Faisalabad of age between 25 to 35 years experiencing tension type headache in occipital region, patients having limitation in movement of head and having bilateral head pain. Exclusion criteria of the study were any diagnosed neurological disease, headache due to medicine overuse, history of recent trauma or surgery, history of chronic infections in neck of head region, recent trauma to the spine, hypertensive individuals and participant's not willing to sign the informed consent form. Non probability convenient sampling technique was used for data collection from sample. Prior to data collection, consent forms were signed by all selected participants. Trigger points in sub-occipital region was detected by manual palpation. Prior to ischemic compression, hot pack was applied to the effected region for ten to fifteen minutes. The intervention of Ischemic compression therapy was performed to release the sub-occipital trigger points. Pre and post treatment data were measured by visual analogue scale (VAS) for pain intensity and HIT-6 for tension type headache. All ethical concerns were taken into account. The study received ethical approval from institutional review board of Government College University Faisalabad. Informed consent was signed by participants prior to data collection. Dignity of all participants was prioritized. All personal data were kept confidential. The collected data were analyzed by using SPSS version 25 and paired sample t-test was used for pre and post treatment analysis.

RESULTS

Table 1 demonstrates the frequency and percentages of demographic statistics. There were total 30 volunteers and all of them were students from the different department of the university. There were 24 females and 6 males. Age was divided into three categories, 50% participants were from the age of 17 to 20 years, 43.3% were from the age of 20 to

23 years and 6.6% were between the ages of 23 to 26 years.

Table 1: Demographic statistics

Demographic statistics (n=30)		Frequency (%)
Gender	Female	24(80%)
	Male	6(20%)
Age	17-20y	15(50%)
	21-23	13(43.3%)
	24-26	2(6.6%)

Table 2 shows the results of paired sample t-test, by comparing the pre and post intervention values of VAS and HIT-6. In VAS the mean score improved from 5.03 ± 2.125 to 0.57 ± 0.626 and a p-value of 0.0005. HIT-6 showed an improvement in mean score from 65.13 ± 5.958 to 40.40 ± 5.021 with a p-value of 0.000.

Table 2: Paired sample t-test results

Paired sample t-test					
	N	Mean \pm SD	t	df	Sig. (2-tailed)
VAS - pre	30	5.03 ± 2.125	11.954	29	.000
VAS - post	30	0.57 ± 0.626			
HIT -6 pre	30	65.13 ± 5.958	18.591	29	.000
HIT-6 post	30	40.40 ± 5.021			

DISCUSSION

Tension-type headache is a nervous illness identified by the susceptibility to attacks of mild to moderate intensity. Stress is known to be the major factor causing tension-type headache [5]. Ischemic compression is a mechanical method of treating myofascial trigger points that involves applying steady pressure over a prolonged period of time to render the trigger points inactive [10]. The purpose of the study was to evaluate the immediate impact of Ischemic Compression Therapy on the Sub-occipital trigger points, in students and faculty members of Government College University Faisalabad suffering with tension-type headache (TTH). Demographic statistics of recent study showed that, out of thirty candidates, 24 were women and 6 were men. This shows the higher frequency of tension-type headache in female students. In support to these results, a study by Rstogi et al., concluded that tension type headache is more prevalent in women as compare to men. Results of that study demonstrated that female to male ratio was 1.6:1 [17]. Results of recent study showed a significant improvement in pain intensity after the treatment of ischemic compression therapy with a difference in mean score of 4.467 ± 2.047 on VAS ($p < 0.05$). The findings of this study was in line with a previous study of 2021, by Khan et al., which reported that the group which received ischemic compression therapy had more significant improvement in pain intensity from 5.28 ± 2.09 to 1.51 ± 1.06 , compared to the other group receiving spray and stretch technique for the management of trigger points in trapezius muscle [18]. Another study by Niemaszy et al.,

supported these finding, which concluded that a single session of 2 minutes ischemic compression on trapezius muscle, relieved the pain intensity as well as improvement in cervical mobility [19]. A study by Panzeri et al., resulted that ischemic compression is one of the foremost treatment intervention for the management of tension-type headache [20]. Similarly, the current study demonstrated a reduction in mean HIT-6 value from 65.13 ± 5.958 to 40.40 ± 5.021 with a p-value of 0.000. It showed that ischemic compression therapy had significant effects in reducing tension type headache. The research by Tao et al., concluded that beneficial effects of ischemic compression is due to the effect of hypoxia which create in that area and then relieved after a specific time period. It helps to enhance the blood flow and oxygen at that region and boost up the endogenous analgesic mediators [21]. The study had a small sample size and limited to participants with age 25 to 35 years, which may limit the generalizability of study findings. Moreover, only subjective and self-reported outcome measures was used which may cause biasness. Lastly the participants were not followed-up for longer time period, so it is not known whether the beneficial effects of ischemic compression were maintained or not.

CONCLUSIONS

In conclusion, ischemic compression had statistical significant effects in sub-occipital trigger point release in the patients of tension-type headache. A significant improvement was seen in pain intensity and headache impact score immediately after the treatment with ischemic compression pressure in both males and females.

Authors Contribution

Conceptualization: AK

Methodology: AK

Formal Analysis: IA

Writing-review and editing: TG, NN, SS, MA, HJ

Author have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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