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Strength and Mobility of the Neck-Shoulder Region in Females Students with Tension-Type Headache in UOH, KSA

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Abstract: ***Background:*** ***Tension-type headache(TTH) is a neurological issue described by an inclination to attacks of mild to moderate headache with few related side effects. TTH is highly prevalent, about 80% of the population will experience it at some time.*** ***Objective:*** ***The purpose of this study was to assess the differences in the strength and mobility of neck-shoulder region between UOH females students with TTH and healthy controls.*** ***Method:*** ***The comparative cross sectional study consisted of 30 students with tension-type headache (TTH), and 30 headache-free controls. Dynamic muscle strength of the upper extremities (UE endurance), mobility of both shoulders (UE mobility), and the cervical range of motion (CROM) were measured.*** ***Results:*** ***Students suffering from TTH had lower values of the cervical lateral flexion to non-dominant side(45± 7.58) than the students in the control(50.66± 13.94). UE endurance in both dominant (27.13± 4.41) , and non-dominant UE(28.06± 3.18), was significantly weaker in the group of students with TTH.*** ***Conclusion:*** ***A significant association was revealed between the TTH and the low endurance strength of both UEs and low dominant side cervical lateral flexion in female students in UOH.***

Keywords: (TTH)Tension-type headache, Strength And Mobility Of The Neck-Shoulder Region ,UE endurance, UE mobility, CROM.

1. Introduction

Tension-type headache (TTH) is a neurological issue described by an inclination to attacks of mild to moderate headache with few related side effects. The finding depends on the history and examination(1). According to classification system for headaches of the International Headache Society (IHS),its defined as either episodic or chronic(2). Episodic tension headache is connected with a stressful event. This type is of direct force, self-restricted, and generally receptive to nonprescription drugs. Chronic tension headache regularly repeats every day and is connected with contracted muscles of the neck and scalp. This kind of headache is two sided and typically occipitofrontal (3). Additionally have been brought by different names throughout the years, including tension headache, muscle contraction headache, stress headache. Of those names, just "tension headaches" is still much of the time used(4). Tension headaches are dull pain, tightness, or pressure around your brow or the back of your head and neck. A few people say it feels like a clasp squeezing the skull.(5) The main cause of tension-type headache is uncertain. Muscle sensitivity to pain ,mental pressure and also stay in one position for a long time, as is the case in reading, using a computer, or playing video games are connected with and aggravate tension-type headache but yet are not obviously its cause. Abnormalities in central pain processing and increased pain sensitivity are present in some patients with tension-type headache(6,7). The tension-type headache is highly prevalent, about 80% of the population will experience it at some time. 86% in women and 63% in men, during childhood there is no male or female predominance for tension- type headache, but during adulthood it is more commonly experienced by women (female-male ratio, 5:4)(8).There is a relationship was found in people with tension- type headache between the effect on daily activity(like sleeping 20.8%) and disturbed by physical activity(9). For treat the tension- type headache take over-the-counter (OTC) pain medications, such as ibuprofen or aspirin , but use it too much may lead to "overuse" or "rebound" headaches. OTC drugs are sometimes not enough to treat recurring tension headaches. In such cases, your doctor may give you a prescription for medication, such as: indomethacin, ketorolac and naproxen(10). A large number of psychological treatment strategies have been used to treat TTH such as : Relaxation training , EMG biofeedback , Cognitive-behavioral therapy. Also physiotherapy have a role in TTH treatment , such as educate the patients a strategies of muscle relaxation , exercise programs, hot and cold packs, ultrasound and electrical stimulation(11). Many patients who suffer from TTH tend to increase their intake of painkillers, which paradoxically can increase the pain. As a result, non-pharmacological ways and often more favorite. The first step is to remove the patient from the drug gradually or suddenly, with the replacement of such treatments such as Active exercise, heat or cold application, and relaxation .The patient is instructed to use these techniques daily at home(12). Have in various studies showed that TTH is connected with trigger points in the suboccipital, upper trapezius, sternocleidomastoid muscles .These muscles are all involved in the movement of the neck. Besides, they found that the cross-sectional area of the rectus capitis back minor was littler in TTH patients with active trigger points , in a small study with 11 TTH females.(13,14,15).

Also , a study from Denmark found that neck pain in individuals with TTH was more common than in the general population(16).

2. Objective of Study

The objective of this study is to assess the differences in the strength and mobility of neck-shoulder region between TTH students and healthy controls.

3. Methodology

Material and Methods

a) Study design

This study is a comparative cross sectional survey, setting in hail university. Sample size was 60 subjects, convenience sampling is use.

The inclusion criteria: Age between 19 and 25 years , TTH for at least 1 year before the inclusion , not received a physiotherapy treatment and not in menstruation period time .

The exclusion criteria: Headache Medications Overuse , Head Trauma ,Visual Impairments and Pregnancy**.**

Exclusion criteria for the healthy controls: history of significant headache.

b) Procedures:

A total of 60 age- and sex-matched female students from the Hail University asked to participate in this study.
The students divided into two groups :
Group A : 30 Students with tension-type headache.
Group B : 30 healthy controls without headache .

c) Strength and mobility measurements:

The dynamic muscle strength of the upper extremities (UE endurance), mobility of both shoulders with the thoracic spine (UE mobility), and the cervical range of motion (CROM) were measured.

UE endurance was measured with a dynamic progressive repetition test. The test measured the endurance capacity of the neck-shoulder and arm muscles. First, the student was seated on a chair with the low back against the backrest. Holding weights in both hands, raised above the shoulders and with elbows pointing downward ,alternating dominant and nondominant UE .After the maximum of 20 repetitions with both UEs , the student was given heavier weights and the test was continued immediately without a rest. Weights of 2 , 3 and 4 kilograms were used . The total number of repetitions of both sides was used for analysis. Altogether, the maximum test performance with three different weights was 60 repetitions of both sides. The test was terminated if the weights dropped below the shoulder level, elbows were not extended above the marked line, upper trunk was moving continuously, or if the low back was not held against the backrest.

UE mobility was measured by using a functional test where the subject in standing position tried to bring the middle fingertips of both hands together behind the back. The distance between the middle fingertips was measured and recorded to the nearest 0.5 centimeter. If the fingertips reached or overlapped each other, the test result was positive; otherwise, it was negative. The test was performed twice: once so that the dominant arm was on top and once so that the nondominant arm was on top. CROM The motion of cervical flexion and lateral flexion and the rotation of dominant and nondominant sides were measured

d) Data analysis

The differences in mean between the two groups were tested by t-test . A $p < 0.05$ was considered statistically significant. The Microsoft excel , was used for statistical analyses.

4. Results

Sixty females students were participate in this study (2 groups: with TTH 30 students and control without TTH 30 students). The characteristics of subjects in both study groups are summarized in **Table1**.

Variables	Students with TTH (n =30) Mean ± SD	Students without TTH (n =30) Mean ± SD	P-value
cervical flexion	55.33± 10.08	59.66±9.90	0.09
Cervical lateral flexion (dominant side)	44.2±8.95	48.16±14.35	0.20
Cervical lateral flexion (non dominant side)	45±7.58	50.66±13.94	0.02
Cervical rotation (dominant side)	57±20.02	58.66±16.34	0.72
Cervical rotation (non dominant side)	57±19.10	61±15.16	0.37
UE mobility (cm)			
Dominant hand above	1.48±2.60	1.91±4.51	0.65
non dominant hand above	2.78±3.68	2.93±5.84	0.90
UE endurance strength (total number of repetitions)			
Dominant UE	27.13±4.41	29.83±0.91	0.001
Non dominant UE	28.06±3.18	29.96±0.18	0.001

Table1-The characteristics of the students with and without TTH

In the flexion movements of the cervical there was no statistically significant difference P(0.09) ,between those students with TTH(55.33± 10.08) and those who did not have(59.66± 9.90) TTH. Students suffering from TTH had lower values of the cervical lateral flexion to non-dominant side(45± 7.58) than the students in the control(50.66± 13.94).

In contrast, in the cervical lateral flexion values to dominant side there was no statistically significant difference. In both groups the cervical rotation movement to both dominant and dominant side had no significant difference. UE endurance in both dominant (27.13± 4.41) , and non-dominant UE(28.06± 3.18), was significantly weaker in the group of students with TTH compared to the group of students without TTH p(0.001).

There were no statistically significant differences between students with TTH (1.48± 2.60)and without TTH(1.91± 4.51) in UE mobility measurements. There were 13 students out of 30 students in TTH group complained a neck pain after the examination.

5. Discussion

This study is to assess the differences in the strength and mobility of neck-shoulder region between TTH students and healthy controls.

In this study, 3 differences observed in the students with TTH compared to the control group were a reduction cervical lateral flexion to dominant side as well as a reduction in bilateral UE endurance. Neck pain symptoms were mentioned. Thus , the results in TTH students , are consistent with our objective. And showed association between strength and mobility of the neck-shoulder region and headache .The association is in two ways: Headache itself may be a cause of reduced strength and mobility, or reduced strength and mobility may predispose to headache (17,18,19). The students with Un favorable working, study postures and movement habits may disturb control of the muscles, and increase the mechanical stress of neck and shoulder tissues which may finally result in only tension-type headache or pain symptoms, or neck pain with concomitant headache.

6. Conclusion

In accordance with the findings of this study, There is though evidence of that the low endurance strength of both upper extremities and low dominant side cervical lateral flexion in female students in UOH, were associated with tension-type headache.

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