Journal of Indonesian Physiotherapy
http://journalphysiotherapy.id/index.php/jip
ISSN: xxxx-xxxx

EFFECT OF CAILLIET AND MC. KENZIE NECK EXERCISE IN REDUCING PAIN IN MIOFACIAL NECK SYNDROME

Kusuma H*, Trisnowiyanto B

Department of Physiotherapy Health Polytechnic Ministry of Health Republic of Indonesia Surakarta
Corresponding author: kusuma.herdianty@gmail.com

ABSTRACT

Introduction: Complaints of neck pain can occur due to increased activity of neck muscles in a long time and repeatedly resulting in the occurrence of neck myofacial syndrome. This situation is characterized by a trigger point that causes pain when pressed and muscle shortening occurs which causes pain when stretched. Cailliet and McKenzie neck exercises are methods that can be used to reduce pain in the neck area.
Methods: The research design used experimental two groups pre and post test design. Pain measurement using Quadruple Visual Analog Scale (QVAS). Subjects were 12 divided into 2 groups, each group consisted of 6 subjects. The study was conducted 6 times for 3 weeks. Cailliet neck exercise dose is an isometric contraction for 6 seconds, repeated 10 times, stretching for 6 seconds at each end of the movement. Dose of Mc. Kenzie neck exercise every movement is maintained for 5 seconds and repeated 10 times.
Result: Hypothesis testing with Wilcoxon in the Cailliet neck exercise group obtained QVAS p=0.046 while in the Mc.Kenzie neck exercise group QVAS values obtained p=0.028 means that there was a statistically decreased pain in neck myofacial syndrome. Mann Whitney hypothesis test results between Cailliet neck exercise and McKenzie neck exercises after treatment obtained p value = 0.616
Conclusion: Cailliet and Mc. Kenzie neck exercise is as good as reducing pain in myofacial neck syndrome.

Keywords: neck,cailliet,mc.kenzie,miofascial syndrome

INTRODUCTION

The neck is a part of the body that connects the head to the body, serves to support the head and perform movements in all directions, namely flexion, extension and rotation so that they are vulnerable to injury (Gatam, 2012).

A study in the Netherlands shows the prevalence of musculoskeletal pain in the neck in the community for one year is 40% and occurs more in women. During one year the prevalence of musculoskeletal pain in the neck in workers between 60-76% and women higher than men. Whereas in Canada as much as 54% of the total population had experienced neck pain within 6 months (Ariens GAM, et al, 2001 in Samara, 2007). This shows that neck pain is experienced by many people.

According to Cailliet (1991), the average adult's head weighs 8-12 pounds (3.6-5.4 kg). If the head with a weight like this is maintained 3 inches in front of the center of gravity, the cervical muscles work strongly to support the head, so that it tends to cause spasm, causing myofacial neck syndrome. Meanwhile, according to Kenzie (1983), the most common thing that causes pain in the neck is due to excessive stretching of the ligaments leading to posture loading.

The main thing is the occurrence of myofacial syndrome is an increase in the release of acetylcholine (ACh) by nerve terminals due to abnormal motor and plate. This state of abnormality explains the relationship between an increase in acetylcholine (ACh) release and an abnormal motor and plate that stimulates retraction of sarcomeres continuously. Sarcomomer shortening activity requires energy through increased metabolism. On the other hand sarcomere shortening will inhibit blood flow resulting in ischemia. Increased energy needs and decreased blood supply will cause an energy crisis, so that it will stimulate accumulation of metabolic waste substances, such as lactic acid which will irritate nociceptors,

causing pain in the tissues concerned. The increase in pain substance turned out to also affect the increase in ACh release, so the cycle continues to recur (Borg-Stein and Simons, 2002).

Myofacial syndrome is a syndrome that often occurs due to various causes, including mechanical and ergonomic. The mechanical cause is the occurrence of acute trauma or repetitive mikrotrauma. This trauma is usually caused by poor body posture (scoliosis, lordosis and kiposkoliosis). While the causes are ergonomic such as a bad sleeping position, a bad work position (forward head posture) (Chaitow, 2011).

Myofacial neck syndrome is characterized by a trigger point in the fascia, ligaments, muscles and tendons in the neck area. The main clinical characteristics of myofacial syndrome are: trigger point, tight band (band link), local twitch response and pain in the extended tissue. While trigger point criteria are (1) band tension, (2) severe pain in the band link, (3) patients feel familiar pain and (4) pain in the stretched area (Fernandes, 2003).

Cailliet neck exercise is an exercise therapy that uses isometric concepts by holding the maximum resistance and ending with relaxation and continued with stretching. The purpose of the exercise is to overcome muscle spasm and to maintain or increase neck muscle strength in static and dynamic neck resistance, maintain wide joint motion and neck flexibility, and obtain correct posture with the correction of muscle imbalance (Rosyidi, 2011).

Mc.Kenzie neck exercise is an exercise therapy that is carried out progressively with the application of using power statically to overcome complaints of local neck or neck pain without nerve or bone disorders. The purpose of this exercise is to (1) strengthen the neck and shoulder muscles, (2) reduce muscle spasm, (3) stretch the shortened muscles in the neck or neck area (Lestari, 2010).

METHODS

This research is an experimental study with two groups pre and post test design. Determination of the group in this study was done by randomization, then the subjects were divided into two groups, Group 1 is Cailliet neck exercise group as many as 6 subjects and group 2 is Mc. Kenzie neck exercise as many as 6 subject. Each group was given 6x intervention, 2x a week and carried out for 3 weeks.

Pain measurement using QVAS is done before and after the intervention. Quadruple Visual Analog Scale (QVAS) is another measuring instrument used to measure pain domains especially neuromusculoskeletal pain to determine the frequency, intensity, duration and location of pain is important (Yeomans, 2006).

QVAS assessment criteria are based on four questions, namely: (1) current pain level, (2) average pain felt in recent years or since first felt pain to date, (3) perceived pain level the lightest and (4) the worst level of pain felt (Christensen, 2007). According to Von Korff (1992, 1993) in Yeomans (2006), assessment of pain measurement only covers questions 1, 2 and 4 while number 3 is not included because at this point it is considered the mildest pain is 0. Each question has a score between 0 and 10. Then the values of questions 1, 2 and 4 are summed and divided by 3 then multiplied by 10 to produce a value of 0 to 100 (Christensen, 2007). In the implementation of pain measurements the patient was asked to circle the number in each question according to the perceived pain state (Thomee et al, 1995).

Cailliet neck exercise is isomteric motion toward flexion, extension, lateral rotation and lateral neck flexion. Each movement is held for 6 seconds, repeated 10 times. Each end of the movement is followed by stretching or stretching in the opposite direction, maintained for 6 seconds. Each end of the movement is followed by stretching in the opposite direction, maintained for 6 seconds.

Mc. Kenzie neck exercise is an isotonic principle, where active neck movements are performed by the subject. Mc. Kenzie movement included (1) head retraction, this movement is the basis of the next exercise, (2) head retraction followed by extension movements to eye view up, (3) head retraction followed by lateral flexion of the neck to the right and left, (4) head retraction followed by rotation neck to the right and left, (5) head retraction followed by neck flexion. Each movement held for 5 seconds, repeated 10 times.

RESULT

After 6 times interventions, 2 times a week for 3 weeks there were 4 drop out, the result subjects are 12, consist of 4 men and 8 women. Each group consists of 6 subjects. The following table are subject characteristics.

Table 1. Subject Characteristics

Characteristics		Group I		Group II	
		N	%	N	%
Age	20-39	1	16,7%	1	16,7%
	40-59	5	83,3%	2	33,2%
	60-79	0`	0%	3	50,1%
Gender	Male	1	16,7 %	3	50%
	Female	5	83,3 %	3	50%
Job	Goverment employee	2	33,3%	2	33,3%
	Private Employee	3	50%	1	16,7%
	Housewife	1	16,7%	0	0%
	PNS Pensionary	0	0%	3	50%

Normality tests are performed to determine the parametric or non-parametric statistical tests to be used. In addition, the determination of statistical tests is also determined by the amount of data analyzed, if the amount of data smaller than 30 (<30) tends to use non-parametric tests. The statistical test used in this analysis is non-parametric because the number of subjects is less than 30 (Hastono, 2006).

Table 2. Group I *Pre-Post Test*

	n	*p*	Z
Pre	6	0,046	-1,992
Post	6		

Based on the table above, the pre and post test different test in group I using Wilcoxon test has a value of p=0.046. The results of different test pre and post test showed p value <0.05 which means that there were differences in the effect of giving Cailliet neck exercises to myofacial neck pain.

Table 3. Group II*Pre-Post Test*

	n	*p*	Z
Pre	6	0,028	-2,201
Post	6		

Based on the table above the different test pre and post test in group II using Wilcoxon test with the number of subjects pre and post test as many as 6 people have a value of p=0.028. The results of different test pre and post test showed p value <0.05 which means there are differences in the effect of giving Mc. Kenzie neck exercise for myofacial neck pain

Different post and post test between the two groups using Mann Whitney test obtained results p = 0.616. P value> 0.05 indicates that there are no differences between the two groups. It shows that there is no difference between Cailliet neck exercise and Mc. Kenzie neck exercise. This two exercises are relatively good to reduce neck miofascial pain syndrome.

DISCUSSION

Based on the research data after being given treatment in the form of Cailliet exercises and Mc. Kenzie neck exercise showed a decrease in pain in both groups. The condition of myofacial neck syndrome occurs due to abnormalities of Acetylcholin (ACh) release by the motor end plate, thus stimulating the sarcomeres to shorten continuously. Sarcomomer shortening activity requires energy through increased metabolism. On the other hand sarcomere shortening will inhibit blood flow resulting in ischemia. Increased energy requirements and a decreased blood supply will cause an energy crisis, which will stimulate accumulation of metabolic waste substances, such as lactic acid. In addition, in the lesion area there are pain substances such as prostaglandins, bradykinin, capsaicin, serotonin and histamine which will irritate the nociceptors, causing pain in the tissues concerned (Borg-Stein and Simons, 2002).

Cailliet neck exercises use isometric principles and are added with stretching to the neck muscles. Isometric training is a form of static exercise where muscle contractions occur but are not accompanied by changes in muscle length and movement in the joints (Kisner and Colby, 2007). While stretching is a state of muscles where muscle fibers or sarcomeres are longer than when muscles relax (Kisner and Colby, 2007).

When isometric contraction for 6 seconds will activate motor nerve fibers and muscles that are maximally innervated. Maximum contraction will also stimulate the golgi tendon of the organ so that it triggers muscle relaxation after contraction (reverse innervation) which causes the release of adhesion found in the intermiofibrils and tendons. Relaxation process will facilitate the acquisition of muscle relaxation, it will obtain the achievement of muscle length which contractures more maximally. Whereas when stretching the muscle fibers are pulled out until the length of the sarcomeres is full. When this happens it will help realign some fibers or abnormal cross links to tension due to myofacial syndrome (Hardjono and Ervina, 2012).

By doing isotonic contractions in McKenzie's neck exercises that can repeatedly increase intramuscular pressure and cause capillary dilation, increased blood flow, so that the substance carrying pain can be transported and pain decreases (Hardjono, 2005). Mc. Kenzie neck exercise produce mechanical effects on joints and muscles that stimulate mechanoreceptor activation on the facet joint in the joint. Mechanoreceptor activation will inhibit pain impulses carried by nociceptors (Suharto, 2001).

Although Cailliet exercises and McKenzie neck exercises have a significant effect on the reduction of pain in myofacial neck syndrome, but if the two exercises are compared there is no significant difference in effect. These results can be caused by several factors including the relatively small number of study subjects and relatively shorter exercise doses compared to the previous study, which is 6x for 3 weeks. Thus, it is expected that there will be an update on future research.

REFERENCES

Borg-Stein dan Simons., 2002; Myofascial Pain. *Arch Phys Med Rehabilitation* 2002; 83 Suppl 1: S40-7.

Cailliet, Rene., 1991; Neck and Arm Pain Edition 3; F.A. Davis Company, Philadelpia.

Chaitow., 2011; Isometric Contraction in Pain Management; Diakses tanggal 10 Oktober 2012, dari http://chaitowschat-leon.blogspot.com/2011/07/isometric-contractions-in-pain.html

Christensen, Kim., 2007; Outcomes Assessment in Chiropractic Practice; Diakses tanggal 6 Desember 2012 dari http://www.dynamicchiropractic.com/mpacms/dc/article.php?id=52325

Fernandes, Cesar et al., 2003; Manual Therapies in Miofascial Trigger Point Treatment: a sistematic review. *Journal of Bodywork and Movement Therapies* (2005) 9, 27-34.

Gatam., 2012; Nyeri Leher; Diakses tanggal 4 oktober 2012, dari http://www.rumahsakitmitrakemayoran.com/category/nyeri-leher/

Harjono dan Ervina., 2012; Pengaruh Penambahan Contract Relax Stretching Pada Intervensi Interferensial Current dan Ultrasound Terhadap Pengurangan Nyeri Pada Sindroma Miofasial Otot Supraspinatus; Diunduh tanggal 31 Oktober 2012, dari http://www.esaunggul.ac.id/wp-content/uploads/kalins-pdf/singles/pengaruh-penambahan-contract-relax-stretching-pada-intervensi-interferensial-current-dan-ultrasound-terhadap-pengurangan-nyeri-pada-sindroma-miofasial-otot-supraspinatus.pdf

Hastono, Sutanto P., 2006; Modul: Analisis Data; Fakultas Kesehatan Masyarakat Universitas Indonesia, Jakarta

Kenzie, Robin., 1983; Treat Your Own Neck; Wright and Carman Limited, New Zealand.

Kisner and Colby., 2007; Therapeutic Exercise: Foundation and Techniques, Fifth Edition; F.A.Davis Company, Philadelpia.

Lestari, Novi, T., 2010; Bab I Pendahuluan: Manfaat Latihan *Static Active Stretching* Dan *Mc Kenzie* Leher Pada Sindroma Miofasial Leher Penjahit. Fakultas Ilmu Kesehatan Universitas Muhammadiyah Surakarta, Surakarta

Rosyidi., 2011; Abstrak; Diakses tanggal 27 Agustus 2012, dari http://alumni.unair.ac.id/detail.php?id=38481&faktas=Kedokteran

Samara, Diana., 2007; Nyeri Muskuloskeletal Pada Pekerja Dengan Posisi Pekerjaan Leher Statis. *Jurnal Fakultas Kedokteran Universitas Trisakti*, vol 26- no 3

Thomee et al, 1995; Quadruple Visual Analog Scale. *Skandinavian Journal of Rehabilitation Medicine*, 27, 145-151

Yeomans, Steve, 2006; Identification and Outcome Management Strategies of the Chronic Pain Patient. *The Academy of Chiropractic Orthopedist*, Vol. 3, Issue 2