Indonesian Journal of Medicine (2022), 07(04): 411-416
Masters Program in Public Health, Universitas Sebelas Maret

Research

The Difference Effect of Special Cervical Collar with Height of 5 cm and 6 cm to Reduce Neck Pain among Students in Karanganyar, Central Java

Alfan Zubaidi, Arif Fadli

Department of Orthotic Prosthetic, Ministry of Health Surakarta

ABSTRACT

Background: Specific cervical collars need to be standardized in order to effectively and efficiently reduce cervical syndrome pain. This condition occurs because the radicle vertebrae are compressed in the long term and even pain can radiate to both shoulders and even to the arches of both hands, this condition will result in abnormal and rapid fatigue. The purpose of this study was to find a standardized cervical collar design specifically to reduce cervical syndrome pain in Tahfidz Karanganyar Islamic boarding school students.
Subjects and Method: This was a Randomized Control Trial (RCT) study which was conducted from March 2022 to August 2022 in all Tahfidz Islamic boarding schools in Karanganyar, Central Java, Indonesia. The sample in this study were 160 students with cervical syndrome. Each group in this study consisted of 80 students who were divided into control and treatment groups using simple random sampling. The dependent variable in this study is neck pain (cervical syndrome). The independent variable is the use of the cervical collar. Data analysis uses the Independent samples t-test if the data is normal, and uses the Mann Whitney test if the data is not normal.
Results: After the intervention was given, the results showed that the average pain in the intervention group using a special collar as high as 6 cm (Mean = 1.11; SD = 0.39) was lower in pain compared to the control group using a special collar as high as 5 cm (Mean = 3.50). ;SD = 0.57) and statistically significant (p<0.001).
Conclusion: The use of a special cervical collar with a height of 6 cm is more effective in reducing pain than a special cervical collar with a height of 5 cm.

Keywords: cervical syndrome, cervical collar, special cervical collar with a height of 6 cm and 5 cm

Correspondence:
Alfan Zubaid. Department of Orthotic Prosthetic, Ministry of Health Surakarta. Jl. Letjen Sutoyo, Mojosongo, Surakarta, Central Java, Indonesia. Email :drsalfanzubaidi@gmail.com

Cite this as:
Zubaidi A, Fadli A (2022). The Difference Effect of Special Cervical Collar with Height of 5 cm and 6 cm to Reduce Neck Pain among Students in Karanganyar, Central Java. Indones J Med. 07(02): 411-416. https://doi.org/10.26911/theijmed.2022.07.04.06.

BACKGROUND

Neck pain is common worldwide, impacting individuals and families, communities, healthcare systems and businesses. There is substantial heterogeneity between epidemiological studies of neck pain, making it difficult to compare or collect data from different studies. The incidence of neck pain in the last 1 year is estimated to be between 10.4% and 21.3% with the highest complaints being experienced by office workers and computer programmers. The prevalence of neck pain in the world varies from 16.7% to 75.1%.

The etiology of neck pain is complex with accompanying risk factors (Genebra et al., 2017). While some studies report that between 33% and 65% of people with comp-

laints of neck pain recover, most cases run episodically throughout a person's life and easily experience relapse (Cohen, 2015). Several jobs such as office workers in several studies have been found to have an incidence rate of neck pain (Cohen, 2015). Inappropriate and out of the ordinary work postures can potentially pose a risk of musculoskeletal injury. A prospective cohort study conducted in Denmark found a prevalence of pain in the neck or shoulders of 28% (Arifah et al., 2019). Ergonomic factors affect the emergence of neck pain or neck stiffness when working or doing activities. One of the activities that can cause neck pain is the activities of students at the Tahfidz Qur'an Islamic Boarding School, Karanganyar Regency. The condition of pain in the neck where there is neck stiffness, so that sometimes there is pain radiating from the shoulder to the hand, this symptom is often called cervical syndrome (Stoppler, 2011).

Handling the problem of neck pain can be done by providing exercise therapy and using assistive devices as therapy. Exercise therapy is body movement, posture or physical activity that is carried out systematically and planned to provide benefits to improve, restore and increase physical function. Exercise therapy can also prevent or reduce health-related risk factors (Kisner and Colby, 2016). The use of therapeutic aids such as cervical collars, neck collars or Cervical Spine Mobilization can have an effect on increasing functional activity and reducing pain (Sari, 2017). Cervical collar is a tool to support the cervical neck or spine which functions to limit neck movement and prevent complications from cervical trauma. The function of giving this collar is as a neck therapy device in reducing interference with neck control. In addition, it also acts as a support for the neck and head so that it can limit the movement of looking down or looking up which can cause discomfort if the position is held for a long time (Widodo, 2014).

Based on research by Ahmed, et al. (2013), explained that there was an effect of placing a cervical collar on the handling of accident patients with spinal cord injuries or cervical fractures. The results showed that the effect of stabilizing the cervical collar with the use of a collar on the incidence of injury was 73.4% and had an effect on immobilization with p=0.003. Indications for insertion of a cervical collar are used in patients who have experienced neck trauma, fractures of the cervical spine. A cervical collar is used for a period of one to two weeks for the purpose of immobilizing and limiting neck motion. Application and installation of the neck collar begins with one hand holding the right and left parts of the head starting from the mandible towards the temporalis, then inserting the neck collar slowly from the back of the neck and bending the neck collar at the chin, attaching the two sides of the neck collar to each other (Aguscik, 2019).

In this study, we will examine the standardization of the special collar model in overcoming problems and preventing cervical syndrome for Tafidz Ouran students in Karanganyar. The standardization in question is to find the most appropriate size/shape, and can increase the comfort of each student with this special design collar. The purpose of this study was to find a standardized cervical collar design specifically to reduce pain in cervical syndrome. Standard, which means a unit of measurement used as a basis for comparing the quantity, quality, value, of existing work. In a broader sense, standards include specifications for both products, materials and processes. It is not permissible, standards must or wherever possible be followed so that activities and results can be said to be generally accepted by the use of these stan-

dards or measurements are the result of cooperation of interested parties in the industry where the company is located. While standardization is determining the size that must be followed in producing something, while making the various sizes of goods to be produced is a simplification effort. Standardization is the process of establishing technical standards, which can be specification standards, test method standards, definition standards, standard procedures (or practices), and others (Peni, 2013).

SUBJECTS AND METHOD

1. Study Design

This research is a Randomized Control Trial (RCT) which was conducted from March 2022 to August 2022 in all tahfidz huts in Karanganyar Regency.

2. Population and Sample

The population in this study were all students in the tahfidz boarding school in the Karanganyar area. The sample in this study was the tahfidz Islamic boarding school students in the Karanganyar area who experienced cervical syndrome, namely 160 students. The division of groups was carried out using simple random sampling technique and the number of groups in the special cervical collar with a height of 5 cm was 80 students and the special cervical collar group with a height of 6 cm was 80 students.

3. Study Variables

The dependent variable in this study was neck pain (cervical syndrome). The independent variable was the use of a cervical collar.

4. Operational definition of variables

Cervical syndrome is a condition of pain in the neck area which is caused by many factors, one of which is an unergonomic position.

Cervical collar is a support device that is used to regulate the movement of the head and neck so as to reduce discomfort or pain due to non-ergonomic positions. The cervical collar in this study used a special cervical collar with different heights, namely 5 cm and 6 cm.

5. Study Instruments

The instrument used to measure pain in cervical syndrome is the Visual Analog Scale (VAS) which uses a score from 1 to 10.

6. Data analysis

Data analysis was carried out using the Independen samples t test if the data was normal, and using the Mann Whitney test if the data was not normal.

7. Research Ethics

This research has received approval from the ethics committee, by obtaining ethical clearance from the Surakarta Ministry of Health Polytechnic, No.LB.02.02 /1.1/2679-/2021

RESULTS

1. Sample Characteristics

The sample characteristics in this study are divided into categorical and continuous data sample characteristics. In this study, the characteristics of categorical data are gender. Where the sample in this study as many as 160 students (100%) are male. Meanwhile, the characteristics of continuous data include the age of students and cervical syndromic pain. The results in Table 1 show that the average age in the two groups is almost the same, namely 14 years which is included in the adolescent age group. Whereas the average pain in the control group was 3.50, which was included in the moderate pain group, and in the intervention group, it was 1.11 which was included in the mild pain group.

2. Bivariate Analysis

In this bivariate analysis, we wanted to find out about a special collar height standard that was effective in reducing cervical collar syndrome in Tahfidz students in Karanganyar Regency. The proposed height mea-

sures are 5 cm and 6 cm where the values for these sizes are based on the results of early studies on students. The results of the normality test with the Kolmogorov Smirnov test showed that the data were not normally distributed, with the p-value of both groups being p<0.001, so for the analysis test using the Mann Whitney test.

The results of the Mann Whitney test on cervical syndrome pain showed that p value <0.001, so it could be concluded that there was a statistically significant difference in the use of a special collar with a height of 5 cm and 6 cm in reducing pain, the smallest average pain value was in the intervention group namely (Mean= 1.11; SD= 0.39) where it can be concluded that a special collar with a height of 6 cm is effective in reducing cervical syndrome pain in students.

Table 1. Sample characteristics (continuous data)

Variable	N	Mean	SD	Min	Max
Control Group					
Age	80	14.84	0.85	14.00	17.00
Pain	80	3.50	0.57	2.00	4.00
Intervention Group					
Age	80	14.50	0.78	13.00	16.00
Pain	80	1.11	0.39	0.00	2.00

Table 2. Differences in effectiveness of special collars with a height of 5 cm and special collars with a height of 6 cm

Group	n	Mean	SD	p
Control				
(Special collar with a height of 5 cm)	80	3. 50	0.57	0.001
Intervention				
(Special collar with a height of 6 cm)	80	1.11	0.39	

DISCUSSION

This research was conducted to determine the standardization of cervical collars for cervical syndrome pain in Hafidz Quran in the Karanganyar region, namely with a height difference between 5 cm and 6 cm, and special collars with a height setting of 6 cm are more effective in reducing neck pain in students. The use of a special collar for students is for 4 weeks which is used as long as students are active in this case reading or memorizing the Al-Qur'an. The results of the Mann Whitney test on cervical syndrome pain obtained a p<0.001, so it could be concluded that there was a statistically significant difference in the use of a special collar with a height of 5 cm and 6 cm in reducing pain, the mean value of pain in the intervention group (Mean = 1.11 ; SD= 0.39) which is lower than the average value of the control group (Mean = 3.50; SD = 0.57), so it can be concluded that a special collar with a height of 6 cm is effective in reducing cervical syndrome pain in students. With the results of this study, it proves that this tool helps to withstand the weight of the head which burdens the muscles around the neck. This research is supported by research from Arifah et al., 2019, which states that there is a relationship between length of work and neck pain (p=0.024).

Another study from Apriyanto et al, (2016) with the results that there were several influences on the treatment of patients

with cervical injuries. In this study, the average value of using a neck collar was 73.2%, of which 67.7% was effective in the initial treatment of pre-ops follow-up with a (p= 0.012). 5.5% with a (p=0.04) increased defense for patient immobilization assistance. Research in line with This is also in line with research by Padmaja, et al. (2016), explained that the effect of the cervical collar on the treatment of accident patients with cervical fractures was compared with intubation. The results showed that the comparison of the effect of using a cervical collar on cervical trauma was an average time of 33.2%, with a (p= 0.032) and was effective in intensive care with intubation. The results of research conducted by Muryati, and Hidayat (2015) regarding initial treatment with stabilization of cervical injuries with the use of a neck collar proved that the effect obtained after installing a support or collar neck was that the patient's neck condition became stable without additional movement and effectively reduced pain and position the patient securely when transferred.

A cervical collar is a neck support device that functions to withstand the physical forces of the neck muscles and cervical vertebrae and head so that they are at the lightest point of load so that comfort can be produced. The use of a cervical collar in boarding school students who use their neck for a long time can cause pain. So that the pain does not get worse apart from carrying out prevention by exercising and evaluating learning positioning, one of the therapies that can be used is the use of a special collar that is suitable as a support or support for the head and neck to prevent cervical syndrome.

Using a special cervical collar as high as 6 cm effectively reduces pain compared to a special collar as high as 5 cm. The cervical collar can handle additional motion thereby preventing the occurrence of severe complications, advanced complications. The patient's level of consciousness can be overcome by using a cervical collar because with a neck support the patient's airway patency is resolved, oxygen in the patient's body can stabilize so that awareness and assist the healing process and follow-up in the initial treatment of patients with cervical fractures (Apriyani, 2022).

AUTHOR CONTRIBUTION

All authors contributed significantly to the results reported, starting from determining the research topic, study design, implementtation, data acquisition, analysis and interpretation. The author also takes part in preparing, revising or critically reviewing articles, has agreed on the journal in which the article has been submitted; and agree to take responsibility for all aspects of the work.

ACKNOWLEGDEMENT

The authors would like to send the deepest gratitude to all members of the team that have assisted in the study.

FINANCIAL AND SPONSORSHIP

There was no financial support and sponsorship

CONFLICT OF INTEREST

There is no conflict of interest in this study.

REFERENCE

Apriyanto, Setiyarini, Sutono (2016). Pelaksanaan penanganan kecelakaan pada pasien cidera servikal dengan servikal collar di RSUP Klaten Jawa Tengah Doi: 18.2044/j.injury .2016.04.03

Arifah HN, Lestyanto D, Widjasena B (2019). The relationship between posture in patient handling and complaints of neck pain in nurses at Dr. Iskak Tulungagung. J. Kesehat. Masy. 7(4): 99-106. Doi: 10.14710/jkm.v7i4.2432-0.

Cohen SP (2015). Epidemiology, diagnosis, and treatment of neck pain, Mayo Clin. Proc. 90(2): 284–299. Doi: 10.1016/-j.mayocp.2014.09.008.

Genebra CVDS, Maciel NM, Bento TPF, Simeão SFAP, Vitta A (2016). Prevalence and factors associated with neck pain: a population-based study. Braz J Phys Ther. 21(4): 274-280. Doi: 10.10-16/j.bjpt.2017.05.005.

Haryatno P, Kuntono Hp (2016). Pengaruh pemberian Tens dan Myofascial release terhadap penurunan nyeri leher mekanik. Int. J. Integr. 5(2): 182-188

Hoy DG, Protani M, De R, Buchbinder R (2010). The epidemiology of neck pain. Best Pract. Res. Clin. Rheumatol. 24(6): 783-92. doi: 10.1016/j.berh.201-1.01.019. PMID: 21665126.

Kisner C, Colby LA (2004). Cervical traction technigue, Philadelphia: Davis Company.

Iheukwumere N, Okoye E (2014). Prevalence of symptomatic cervical spondylosis in A Nigerian tertiary health Institution. Trop. J. Med. Res. 17-25. Doi: 10.4103/1119-0388.130178.

Lv Y, Tian W, Chen D, Liu Y, Wang L, Duan F (2018). The prevalence and Associated Factors of Symptomatic Cervical Spondylosis in Chinese Adults: A Community-Based Cross-Sectional Study. BMC Musculoskelet. Disord. 19(325): 1-12.

Padmaja (2016). Comparison of patient intubation and use of a cervical collar in cervical trauma. 92(3): 179–326. Doi: 12.2032/oxfordjournals.bja.a034647

Peni W (2013). Jarimatika Perkalian dan Pembagian. Jakarta: PT Kawan Pustaka.

Sari DP (2017). The influence of difference between cervical spine mobilization and cervical traction to the increase of neck functional activity on cervical root syndrome patient. skripsi. Program studi fisioterapi. universitas aisiyah yogyakarta.

Stoppler M (2011). Neck Pain. Diakses pada tanggal 26 September 2021, dari http:-//www.medicinenet.com/neck_pain/article.htm

Widodo S (2014). Penatalaksanaan Fisioterapi Pada Kasus Cervical Root Syndrome Di Rsud Dr. Moewardi Surakarta.

Zhang Z (2016). Univariate description and bivariate statistical inference: The first step delving into data. Ann. Transl. Med. 4(5). Doi: 10.21037/atm.2016.0-2.11.