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The effectiveness of acupressure and slow deep breathing (SDB) toward peak expiration current value in asthma patients

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ABSTRACT

Background

Asthma has affected more than 5% of the population around the world which causes mortality problems and asthma morbidity tends to increase. The presence of asthma indicators can be seen from the decreased lung function value or the clinical picture results in the classification of persistent weight i.e. the peak expiratory current value is less than 60% and the peak expiratory current variability value is more than 30%. One of the treatment of asthma with traditional health services which is a national cultural heritage that has been growing and developing in Indonesia, one of which is massage. Types of massage that are developing at this time include acupressure. Acupressure is a simple, easy to do complementary (non-pharmacological) therapy that has no side effects because it is not an invasive action. Besides acupressure, therapy slow deep breathing (SDB) can also help and reduce asthma sufferers in Indonesia.

Methods

This research is a Quasy Experimental with a pre-test – post-test with control group design. This research arranged two groups namely the intervention group that was given acupressure therapy at the acupoint points of Tiantu (CV 22), Lieque (LU 7) and Taiyuan (LU 9) with slow deep breathing (SDB), while the control group was only given therapy slow deep breathing (SDB) without acupressure. Technique Probability sampling with purposive sampling method is used to get 36 respondents who are divided into 2 groups.

Results

Test results Repeated Measure Anova showed a significant difference with p value 0.000 (<0.05) means that the intervention group is better at increasing peak expiratory current than the control group.

Conclusion

Acupressure and slow deep breathing (SDB) therapy for 14 days with 2 measurements was very effective in increasing peak expiratory current.

Keywords: Acupressure, Slow Deep Breathing (SDB), Peak Expiration Current, and Asthma.

INTRODUCTION

Asthma is a condition in which the occurrence of disorders that can be in the form of inflammation or chronic inflammation of the respiratory tract that causes bronchial hyperactivity to stimuli characterized by wheezing, coughing, shortness of breath and discomfort in the chest especially often occurs at night or early morning [1-4].

Asthma has affected more than 5% of the population worldwide, and there are several indicators that show that prevalence continues to increase. The prevalence of asthma in children is 8-10% and in adults 3-5%. The increase in prevalence is due to the incidence of undiagnosed asthma, poor air quality and changes in the lifestyle of the community itself [4].

The problem of mortality and morbidity of asthma still tends to increase, according to the World Health Organization (WHO) in collaboration with asthma organizations in the world, the Global Astma Network (GAN) predicts that currently the number of asthma patients in the world reaches 334 million people, it is estimated that this number will continue to experience an increase of 400 million by 2025 and 250 thousand deaths from asthma in adulthood and children [5].

Nearly 44 million people in East Asia or the Pacific region suffer from asthma, although prevailing reports and reports show large variations in that area, in China there is a 10-fold variation in asthma prevalence. Experts believe that a significant increase in the prevalence of asthma will be reported in China. They predict that an absolute increase in asthma prevalence of 2% in China will cause an increase of 20 million asthma patients worldwide [2, 4].

Basic Health Research (RISKESDAS) in 2018, stated that the prevalence of asthma of all ages in Indonesia reached 2.4% (1.017.290 people), whereas in South Kalimantan Province it reached 2.8% or greater 1.1 % of the Indonesian average [6].

There are respiratory indicators for asthmatics who experience inadequacy with the discovery of wheezing symptoms, shortness of breath, and chest feels heavy [7]. In addition, asthma indicators can be seen from pulmonary function values that have decreased or the results of the clinical picture in the classification of persistent weight i.e. the peak expiratory current value is less than 60% and the peak expiratory current variability value is more

than 30%. If there is severe obstruction in the pulmonary airways above the main carina then respiratory failure occurs which causes hypoxia and hypercapnia resulting in a decrease in the value of oxygen saturation [8].

There are many parameters and methods for assessing pulmonary physiology, but many are widely accepted, standardized and what is possible is an examination of peak expiratory current. A portable and simple tool for assessing peak expiratory current known as peak expiratory current meters [7, 9].

Management of asthma so that recurrence can be reduced has been implemented through medical management in the form of controlling drugs such as inhaled corticosteroids, systemic corticosteroids, sodium chromoglycate, nedochromyl sodium, methylanthin, second-generation anti-histamine (H1-antagonists), relieving medications such as beta-agonists 2 short work, systemic corticosteroids, anticholinergics, aminophylline and adrenaline [10, 11].

Asthma sufferers in Indonesia, reaching 1.017.290 people, certainly need a solution and treatment that serves as a therapy to help reduce symptoms of recurrence in asthmatics. Traditional or complementary health services are one of the activities in organizing health efforts in Indonesia. Appropriate therapy to help and reduce asthma sufferers in Indonesia, namely complementary therapy (non-pharmacology), one of which can be done with acupressure therapy and slow deep breathing (SDB).

Traditional health services are a national cultural heritage that has been growing and developing and maintained for generations by the community itself, used since ancient times until now with a tendency to continue to increase. One of the traditional types of health services that is widely developed in society is massage. Massage which has long been known by the people since ancient times as part and effort to make them healthier and has a considerable influence in meeting the needs for health services. The type of massage that is developing at this time is acupressure [12].

Acupressure treatment originating from China has been known for thousands of years ago and by applying pressure or massage and stimulates certain points in the body. Acupressure is a simple therapy, easy to do, has no side effects because it is not an

invasive action. Acupressure is very practical because it does not require any equipment and is enough with the hands or fingers and is cheap and safe [13, 14].

Manual stimulation of acupressure points has been shown to increase serotonin and endorphin production, which has a role in increasing the regulation of serum cortisol. One of the effects of acupressure point suppression is that it can increase endorphin levels which are useful as pain relievers produced by the body in the blood and opioid endogenous peptides in the central nervous system. Endorphin is a natural opiate produced in the body, has a positive effect on emotions, reduces anxiety, causes relaxation and normalizes bodily functions, while serotonin has the function of regulating mood. The neural network will stimulate the endocrine system to release endorphins according to the body's needs and is expected to reduce the feeling of tightness during breathing experienced by people with asthma [13, 15].

Technique Slow deep breathing (SDB) that also aims to reduce asthma symptoms so that asthma attacks can be controlled properly. Slow deep breathing (SDB) is a breathing technique with a breathing frequency that is less than 10 times per minute and whereas a long inhaled phase, actions are based on regulating deep and slow breathing [16, 17].

Slow deep breathing (SDB) which is more focused on how to breathe correctly so that it can reduce and overcome the symptoms of asthma. The action on the breathing technique can be done independently by asthmatics so that it can be implemented as one of the complementary therapies aimed at controlling asthma. From the technique slow deep breathing (SDB), the lungs get a lot of oxygen flowing throughout the body [17, 18].

From the results of research that has been done by I Wayan Suardana with the title acupressure and changes in upper respiratory tract infections complaints in toddler patients. From the average pre-test results of 4.06, post-test 3.86 in the control group, the average results of the pre-test 4.13, post-test 2.06 in the treatment group. Analysis of the data in this study using the Wilcoxon test signed rank and Mann Whitney test, results $p = 0.000 (<0.05)$ [19].

Research that has been conducted by Lina Rostini with the title Effect of combined

therapeutic acupuncture of thread and medicamentosa on control and pulmonary function in patients with partially controlled and uncontrolled bronchial asthma. From the results of the study showed a significant difference in changes in ACT scores and the presentation of changes in APE values before and after treatment were higher in the case group than in the control group ($p < 0.05$). The percentage of changes in VEP1, KVP, and VEP1 / KVP values before and after treatment was higher in the case group compared to the control group but the difference was not statistically significant $p = > 0$ [20].

The results of Amanya's research show that acupuncture at 7 meridian points LU 1, LU 2, CU 17, BL 13, BL 17, LU 5, LU 7 can improve lung function with the effect size 0.143 [21].

From the data from previous studies conducted by Nurul Dwi Astuti with the title effectiveness of therapy Slow Deep Breathing (SDB) on the level of asthma control in patients with persistent bronchial asthma being at the pulmonary health center in the Semarang area. From the analysis of researchers found that there were significant differences between the difference between the pre-test and post-test APE values ($p = 0.004$), the daily variance of peak expiratory current ($p = 0.005$), ACT ($p = 0.001$), ugd visits ($p = 0.038$), and effects Aside from the drug ($p = 0.010$) between the intervention group and the control group, from these results the breath therapy was slow deep breathing (SDB) effective for increasing the level of asthma control in asthmatics [16].

Research conducted by Ardina, obtained results after intervention slow deep breathing for 15 minutes an increase in the value of oxygen saturation with a p value = 0.001 [22].

From the observations of researchers after conducting a preliminary study of asthma sufferers who visited Martapura 2 Public Health Center, said that if asthma recurred, patients would immediately take asthma medication given by a doctor or go to the health center if the drug has run out. Many asthma sufferers consume asthma medications and inhalers regularly. The patient said there had never been counselling about overcoming asthma in a complementary or non-pharmacological way such as acupressure therapy and slows deep breathing (SDB). With the implementation of complementary therapy given to asthmatics, it can be expected that the incidence rate of asthma recurrence is reduced

and can reduce the use of inhalers and drug consumption. Based on these problems, researchers are interested in conducting research on "The Effectiveness of Acupressure and Slow Deep Breathing (SDB) Towards Peak Expiration Current in Asthma Patients".

METHODS

This type of research uses Quasy Experiment with an approach pre-test – post-test with control group design. This study arranged two groups namely the intervention group that was given acupressure therapy at the acupoint points of Tiantu (CV 22), Lieque (LU 7) and Taiyuan (LU 9) with slow deep breathing (SDB), while the control group was only given slow deep breathing (SDB) therapy. Acupressure therapy is given by using the finger as much as 30 times the pressure at each point and slow deep breathing (SDB) for 30 minutes is given as much as 8 times for 14 days. Measurement of peak expiratory current can be done using instruments peak flow meter, calculators, body weight and body height scales, alcohol swabs, tissues, handsoons, ballpoints, demographic sheets

and observations sheets. Measurement of peak expiratory current of respondents who have asthma is done before and after the therapeutic action (days 7 and 14).

The population in this research was asthma sufferers who routinely checked up at Martapura 2 Public Health Center. Determination of the minimum sample size using technique probability sampling with purposive sampling method and based on inclusion and exclusion criteria as many as 36 respondents divided into two groups with 18 respondents each in the group intervention (acupressure therapy and slow deep breathing (SDB) therapy) and 18 respondents in the control group (slow deep breathing (SDB) therapy).

In this study the researchers collected data by observation, identification, interviewing and filling out questionnaire sheets. The data collected was analysed through the IBM SPSS program version 24.0, and continued with the test the difference is the parametric test (Paired t test and Repeated Measure Anova). The processed data is used as a basis for discussing statement matters, which are then presented in tabular form so that conclusions can be drawn.

RESULTS

Table 1 Frequency distribution of respondents from age, gender and asthma degree based on demographic data

Characteristics Respondent	Intervention Group (N=18)		Control Group (N=18)		p		
	F	%	Mean±SD	F		%	Mean±SD
Age			43.00±9.610			38.61±10.112	
Gender							
Male	5	13.9			5	13.9	1.000
Female	13	36.1			13	36.1	
Asthma degree							
Persistent mild	15	41.65			15	41.65	1.000
moderate Persistent	3	8.35			3	8.35	

*Homogeneous Test

Based on the table above we get the data that the average age in the intervention group is 43.00 years, while in the control group is 38.61 years. Then the mean gender and asthma degree in the

intervention group and the control group had the same significant value of 1.000 (> 0.05) meaning the same or homogeneous.

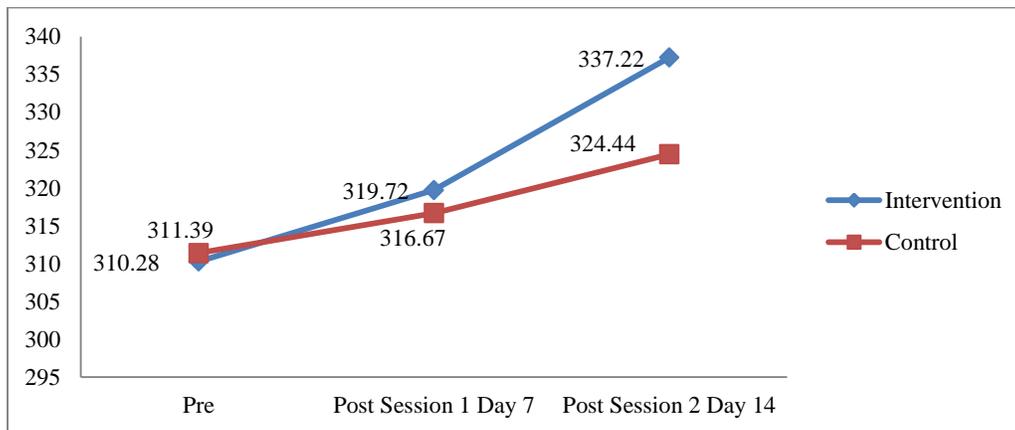
Table 2 Overview of peak expiration current between in the intervention group and control group

Measurement	Group	Mean	SD	Min-Max	Range
Pre	Intervention	310.28	12.888	290-330	40
	Control	311.39	8.368	300-325	25
Post Session 1 Day 7	Intervention	319.72	14.800	300-345	45
	Control	316.67	11.757	290-335	45
Post Session 2 Day 14	Intervention	337.22	12.274	320-360	40
	Control	324.44	12.113	300-340	40

*Paired t test

From the table above shows that the average value of the intervention group at the last post was 337.22 which is higher than the control group with a mean value of 324.44. The intervention group can

reach a maximum peak expiratory current value of 360 L / min while in the control group it reaches a value of 340 L / min.



Graph 1 Increased peak expiration current between in the intervention group and control group

Based on graph 1 shows that the value of peak expiratory current in the intervention group

increased higher at post session 1 and post session 2 than in the control group.

Table 3 Analysis of peak expiration current between in the intervention group and control group

Group	Type III Sum of Squares (Jumlah)	Df	Mean Square (Rata-rata)	F	*P
Between Group	5613113	1	5613113	10984.52	0.000

*Repeated Measure Anova Test

Table 4 Analysis of the effectiveness of acupressure and slow deep breathing (SDB) on peak expiration current between in the intervention group and control group

Variable	Group	Mean	SD	Difference (IK 95%)	*p
PEC Pre	Intervention	310.28	12.888	-1.111	0.761
	Control	311.39	8.368		
PEC Post 1	Intervention	319.72	14.800	3.056	0.497
	Control	316.67	11.757		
PEC Post 2	Intervention	337.22	12.274	12.778	0.003
	Control	324.44	12.113		

*General Linear Model Test **Post Hoc Test

Based on the above table shows that there are differences in the overall with a value of $F = 10984.52$ and $p = 0.000$, and in table 4 shows the specific effectiveness for each time there is a significant difference starting at post 2 or the 14th day, with a value of $p = 0.003$. With the conclusion that the intervention group that was given acupressure and slow deep breathing treatment was very effective in increasing the peak expiratory current value.

DISCUSSION

The results of this research after being given acupressure therapy for acupoint points Tiantu (CV 22), Lieque (LU 7) and Taiyuan (LU 9) by using fingers 30 times the pressure and clockwise rotation at each point and slow deep breathing for 30 minutes given 8 times for 14 days, proven to be effective in increasing the value of peak expiratory current in asthma patients starting at measurement day 14 (post 2) with value p of peak expiratory current of 0.003. The results of this research achieved a normal peak score in clinical expiratory current only in female respondents totaling 26 people, namely the intervention group of 13 respondents while in the control group who achieved a normal score in only 12 respondents out of a total of 13 respondents. Of the 10 male respondents in the intervention group and the control group none achieved a normal clinical peak expiratory current score, where there were several factors that affected the condition namely work environment exposure, including cigarette smoke or exposure to active smokers, respiratory infections, air pollution (indoor or outdoor) and work dust.

This research is in line with Ola's research which states that asthma patients who are given acupuncture therapy at points LU 5, LU 7, LU 9 can increase the peak expiratory current value with p value = 0.001 [23]. Research from Yosef Maha which states that asthma patients who are given acupuncture therapy at point LU 9, CV 22 can increase the value of the peak current of aspiration with a p value = 0.04 [24]. The Ngai SP research states that the acupuncture points LU 7 (Lieque) and LU 9 (Taiyuan) on the lung meridians are significantly higher in asthma subjects with p values <0.05 and negatively correlated with the predicted percent FEV_1 (Forced Expiratory

Volume) $r = -0.34$ to -0.40 with a p value <0.005 [25].

Acupressure at the acupoint points of Tiantu (CV 22), Lieque (LU 7) and Taiyuan (LU 9) are supplied by sensory nerve fiber, so that if these points are stimulated, they can stimulate the sympathetic nervous system. The stimulation of the sympathetic system can cause the release of neurotransmitters that stimulate β_2 adrenergic (sympathetic) receptors in smooth muscle that result in bronchodilator so that it can increase the peak expiratory current value [26].

Asthma is a disease with reversible airflow limitation so it is recommended to use FEV_1 , which is spirometry or the peak current of aspiration as a level of asthma control [27]. Breathing with an exercise method slow deep breathing that is carried out for 30 minutes will cause relaxation so that it stimulates the expenditure of endorphin hormones that have a direct effect on the autonomic nervous system and causes a decrease in the work of the sympathetic nervous system and an increase in the work of the parasympathetic nervous system resulting in decreased shortness of breath characterized by increased value peak expiratory current.

Another study conducted by Vicentia stated that there was an effect of deep breathing exercise on the peak expiratory current value with a value of $p = 0.043$ or $p <0.05$ [28]. Breathing exercises with slow deep breathing are the most efficient breathing exercises with inspiration in being able to effectively open khon pores, causing collateral ventilation so that the alveolar does not collapse and during expiration the khon pores close for lung ventilation. Breathing exercises by exercising the respiratory muscles routinely will increase the work of the heart, so that blood circulation throughout the body runs smoothly, especially to the muscles of the body including the respiratory muscles which, if done regularly, will increase the peak current of expiration [29, 30].

When breathing exercises and exhaling air slowly and deeply carried out continuously can make an activity patterned between the control of the respiratory center with a combination of respiratory muscle performance, compliance lung and chest frame structure that can produce adaptations to the rhythm and speed of breathing [31]. To meet the needs O_2 of active tissue and the release of CO_2 during acupressure and training

techniques slow deep breathing (SDB), integrated work of various cardiovascular and respiratory mechanisms is needed. This change in circulation will increase blood flow to the muscles, while adequate circulation in other parts of the body must be maintained. Taking O₂ from the blood to the muscles that work will increase and ventilation is also enhanced so that the amount of O₂ can be provided, the amount of O₂ that enters the blood stream in the lungs increases because of the increase in the amount of O₂ [18]. In this study the intervention group that was given acupressure therapy and slow deep breathing (SDB) therapy had a peak value of expiratory current statistically and clinically better than the control group that was only given slow deep breathing (SDB) therapy alone.

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CONCLUSION

Based on data processing and analysis regarding the intervention group of acupressure therapy and slow deep breathing (SDB) on the peak expiratory current value, the following conclusions can be drawn:

1. The intervention giving of acupressure therapy and slow deep breathing is effective against increasing the peak expiratory current value on the 14th day measurement (post 2) with the value obtained (p = 0.003).
2. Giving acupressure therapy and slow deep breathing statistically good to be applied in patients with asthma with mild persistent and moderate persistent degrees, the implementation of these therapies can increase the value of peak expiratory current (PEC).

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