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Original Article

The Effect of Acupressure on Increasing Oxygen Saturation in Pneumonia Patients

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ABSTRACT

Pneumonia is one of the top 10 hospital admissions, with a case proportion of 53.95% male and 46.05% female. Pneumonia can cause complications in the oxygenation process that lead to decrease the oxygen saturation value and causes hypoxemia. The puspose of this study was to analyze the effectiveness of acupressure on increasing oxygen saturation in patients with pneumonia. The design used quasi experiment pre test and post test with control group design approach. The sampel of this study was patiens with pneumonia between of 18 to 64 years, which choosing by convenience sampling. Participants in the experimenal group received auricular acupressure at the Shen Men and 5 meridian points, that is LU1, LU2, BL11, BL 12, and BL13. Data collection was done by measuring oxygen saturation using a plus oxymeter. The analysis test to determine the effect of acupressure on oxygen saturation using the Mann-Whitney Test with a significance level of 0.05, and N-Gain. The results showed that average oxygen saturation before acupressure in the intervention group was 74.00% and in the control group 73.15%. After acupressure there was an increase of saturation oxygen 23,8% in the intervention group and 21% in the control, and the effect test showed that there was an effect of acupressure on oxygen saturation (pValue 0.000). The conclusion is acupressure therapy can accelerate increaseing oxygen saturation in pneumonia patients. Therefore, it is recommended that besade addition standard therapy, pneumonia patients can also be given acupressure to accelerate healing.

Keywords : *Acupressure, Breathing Points, Pneumonia, Oxygen Saturation.*

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INTRODUCTION

Pneumonia is an infectious disease concerning the lower respiratory tract with signs and symptoms similar as coughing and briefness of breath caused by the presence of infectious agents, such as viruses, bacteria, mycoplasma (fungi), and/or foreign substances in the form of exudates (fluid) and consolidations (cloudy spots) on the lungs[1]. WHO states, that prevalensi of pneumonia cases are 1.5 and 14 cases per 1000 people/year, with a death rate of 9.2 million people in 1 time worldwide[2] . The prevalence of pneumonia in Indonesia also increased by 0.4% in 2018 compared to 2013[3]. According to the Indonesian Lung Doctors Association (PDPI),

the *crude fatality rate (* CFR) of pneumonia is 7.6%[4]. One indicator of impaired breathing is the oxygen supply to the body. Organs in the body need an adequate supply of oxygen. Therefore, body functions can work optimally and effectively. If oxygen saturation is low, it can cause hypoxemia which is characterized by shortness of breath, respiratory frequency of 35 breaths/minute, rapid and shallow pulse, and cyanosis[5]. One effort that can be made to accelerate the increase in oxygen saturation in pneumonia patients is by acupressure.

Acupressure is a type of physical therapy that massage and stimulates specific points on the body[6] Acupressure is a technique for treating disease by massaging and pressing certain points using your fingers to activate the circulation of vital energy[7,8]. Research by Alipour et al (2022), states that acupuncture can improve the respiratory tract, reduce the development of mechanical ventilation, hypoxemia, tachypnea, dyspnea, cough, sore throat weakness, myalgia, anorexia, and the need for oxygen therapy in COVID-19 patients treated at home sick [9]. Research by Yakout et al (2021) on bronchial asthma patients in the inpatient unit of Alexandria University Hospital by applying pressure and finger massage on five acupuncture points (LU1, LU7, LU9, LI 4, and LI11) showed that there were differences in the degree of dyspnea in these patients. compared with controls[10] . Research by Liu et al (2021), on 128 COVID-19 patients who carried out *Qigong Exercise* and *Acupressure Rehabilitation Program (QARP) interventions*, showed a significant increase in vital signs and faster treatment times compared to controls[11]. Another study conducted by Fan, et.al (2023), said that acupuncture remedy turned into powerful in enhancing lung function , quality of life, and physical capacity, and may be used as an alternative treatment for sufferers with chronic obstructive pulmonary disease (COPD)[12] .

Based on the description above, the difference between this research and previous research is that the research subjects suffered from pneumonia and had acupuncture at five respiratory tract points (LU1, LU2, BL11, BL12, and BL13). The puspose of this study was to analyze the effectiveness of acupressure on increasing oxygen saturation in patients with pneumonia.

METHOD

The study design used a quasi experiment pre test and post test with control group design approach. The research conducted at Dr. Soekardjo Hospital Tasikmalaya, from 17th April to 16th August 2023. The population of this study was all patiens with pneumonia that is not caused by cardivascular disorder or anemia between of 18 to 64 years. We use convenience sampling, whichis choosing subjects with certain criteria. Inculsion criteria is pneumonia patients who had received antibiotic and oxygen therapy with a nebulaizer, while exclucion criteria are patients who don't decreased consciousness. Experiment were divided into 2 groups. The sample size is 1:1 with each group is 20 participan.

Participants in the experimenal group received auricular acupressure at the Shen Men and 5 meridian points, that is LU1, LU2, BL11, BL 12, and BL13 by using fingers therapist, slowly and rhythmically starting from light, medium to hard pressure, with circular pressure in a clockwise direction to pen on the chest and back area. Pressure was applied for 2 minutes for each point twice for 3 consecutive days. Before and after the intervention, oxygen saturation was measured using *pulse oximetry* and then analyzed using the Man-Whitney test at a confidence level of 95%.

RESULTS

Table 1. Charateristics of responden

Category	Group	
	Intervention	**Control**
Age (n=20)		
Mean	64.35	65.65
SD	17.092	18.175
Min	27	27
Max	88	85
Sex (n=20)		
Male	5 (25%)	10 (50%0
Female	15 (75%)	10 (50%)

Table 1 shows that the respondents have an age range 27-88 years. Based on sex, the majority of responden in thr intervation group is female (75%), while the control has the same number between male dan female (50%).

Table 2. Differences of oxsigen saturation

Category	Before		After		p-values
	Group		Group		
	Intervention	Control	Intervention	Control	
Mean	74,0	73,2	97.9	94,3	
Median	76,0	71	98	94	0,0001
Min	86,0	12	95	92	
Max	61,0	37	99	97	

Based on the table 2, it is known that the oxygen saturation level of intervention group before acupressure therapy was carried out for 2 minutes twice/day for 3 consecuatuve days was increased by 23,9% with an average oxygen saturation from 74,0 to 97,9. Mean while in the control group, the increase was only 21% with an average osygen saturation from 73,2 to 94.3. The results of the *Man Whitney* test obtained pValue = 0.0001 ($\leq$0.05), meaning that acupressure had a significant effect on increasing oxygen saturation in the intervention group.

Table 3. The Effectiveness of Acupressure Therapy

Oxygen Saturation	**N-Gain (Min-Max)**	Information
Intervention Group (n=20)	91.2 (80-97)	Effective
Control Group (n=20)	76.2 (57.1 – 85)	

As calculated by the N-gain test, the mean N-gain score for the intervention group was 91.2%, the minimum N-gain score was 80.0 and the maximum was 97.0. But, in the control group, it was 76% with a minimum N gain score of 7.1 and a maximum N gain score of 85. Based on the known analytical value of 1.196, we can conclude that acupressure therapy is more effective. Reducing the increase accelerates oxygen saturation in patients with pneumonia.

DISCUSSION

The result showed that acupressure can increasing oxygen saturation in the intervention group compared to control group, with a p-value = 0.0001. This research is in line with Pratama's research that accupreasure and slow deep breating have an effect on increasing peak expiratory flow values (p-value=0,003) and oxygen saturation (p-value=0,001)[13]. Likewise Saputra's research shows that accupressure is a complementary therapy for patiens with respiratory disorders[14].

Oxygen saturation is the amount of oxygen bound to red blood cells and reflects the extent to which oxygen is distributed to all body tissues. If the oxygen level in the blood is low, it will affect vital organs and cause hypoxia or even lung dysfunction [15,16].

In pneumonia sufferers, oxygen saturation is an important indicator in evaluating the severity of the disease and determining the need for treatment. Pneumonia can cause damage to lung tissue, and inhibit normal ventilation and inflammation in the alveoli area, thereby disrupting oxygen exchange between the lungs and blood (gas diffusion) and causing a decrease in oxygen saturation [2 ,15] .

Acupressure therapy is an alternative treatment technique that provides a flow of vital energy (qi) by pressing certain points using the fingers inside the body and stimulating sensory nerve cells around the acupressure points which will stimulate the spinal cord, mesencephalon, and hypothalamus-pituitary complex[16,17]. Acupressure therapy on the respiratory median is known as a water channel with regional flow resistance and functions to drain nutrients, remove supersession waste, and convey physical and chemical responses. Acupressure stimulation can induce neurotransmission and changes in chemical reactions in the central nervous system, causing the release of the hormones dynorphin, serotonin, noradrenaline, beta-endorphin, and metaenkephalin[18,6]. Moslehi's et all's research explains that acupressure at P6 point in patients can effect

mechanical ventilation, blood circulation, increase blood pressure and respiratory rate[20].

Pressure on the LU1 and LU2 points will provide energy and strength to the lung organs which provides maximum lung diffusion[19] . The LU2 point aims to eliminate heat in the lungs; reduce pain in the front of the neck/throat, and reduce anxiety. The LU1 point is the front Mu point of the lung meridian, namely the meeting of the lung meridian and the spleen meridian, which provides tonification of Lung Qi and Yin, regulates the distribution of lung Qi, and relaxation of the chest cavity and respiratory tract [19,22]. Points BL11, BL12, BL 13 will provide a sense of relief in the breathing process which causes maximum ventilation in the meridians. Points BL11 and 12, are the meeting points of the small intestine median and the BL median, San Jiao median, and gall bladder median. The function of this point is to stimulate blood flow to the lungs, the cough reflex point, and relax and regulate lung Qi. Point BL13, is the Shu point at the back of the lungs which functions to facilitate the distribution of air in the respiratory tract-lungs; opens the airways in the lungs, and soothes and relaxes the airways in the lungs [10,11,21,23] .

CONCLUSIONS

The conclusion of this study is that acupressure at 5 tonification points including LU1, LU2, BL11, BL 12, and BL13 can accelerate oxygen saturation levels in patients with pneumonia. Based on this, it is necessary to develop acupressure therapy in addition to administering oxygen. As a result, residence time and oxygen saturation can be faster.

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