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# "THE EFFECT OF LIGHT MASSAGE ON PERIPHERAL BLOOD CIRCULATION IN TUBERCULOSIS PATIENTS"

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## ABSTRACT

Tuberculosis is still a major problem in the health sector, including side effects from treatment Side effects from tuberculosis treatment that are often experienced include indigestion, nausea, joint pain, dizziness, redness, itching, redness of the skin, liver disorders, joint pain, and paresthesia or tingling. Tingling caused by blood circulation is not smooth. Light massage is a massage therapy in the form of gentle movements on the soft tissues of the body including wiping and rubbing movements, this skin stimulus will provide a sense of comfort, relaxes tension in the muscles, and increases blood circulation. The purpose of this study was to determine the effect of Light Massage therapy on peripheral blood circulation in tuberculosis patients. This study uses a true experiment pre and posts control group design. The number of samples of this study was 30 respondents in the intervention group and 30 respondents in the control group. The study was conducted in the working area of the Sokaraja Community Health Center. The sampling technique used is simple random sampling. The mean respondent was female (56.7%), with an intensive treatment phase (76.7%), mean Ankle Brachial Index (ABI) score in the intervention group 1.03, and the control group 1.06. There were no differences in ABI scores between the intervention and control groups. Administration of light massages interventions for 3 times has not been able to reduce the ankle-brachial index score in tuberculosis patients. Further research needs to be done on ABI scores in patients with advanced treatment phases.

Keyword: Aankle brachial index, circulation, light massage, tuberculosis

## INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*. Until now, tuberculosis is still the most dangerous infectious disease in the world. The World Health Organization (WHO) reports that as many as 1.5 million people died of TB (1.1 million HIV negative and 0.4 million HIV positive) with details of 89,000 men, 480,000 women and 140,000 children. In 2017, the new TB cases were estimated to occur in 10.0 million people and 1,3 million HIV-negative people died from TB and 0.30 million (range: 0.27–0.34 million) HIV-positive people died from TB [1]. Tuberculosis (TB) is currently still designated by the World Health Organization as a global public health emergency since 1993, but until now TB is still a major problem in the health sector [1-3]. The problem that occurs is the success rate of TB treatment that continues to decline in Indonesia. Central Java's response to the success of TB treatment also has decreased each year, namely in 2015 reaching 82%, down to 76.9% in 2016,

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and again decreased to 73.38% in 2017 [4,6]. The cause of the success rate is influenced by the side effects of anti-tuberculosis drugs[6].

Side effects of tuberculosis drugs treatment that are often experienced by people with TB include indigestion, nausea, joint pain, dizziness, redness of the urine, itching, redness of the skin, liver disorder[3,7]. According to research conducted by Bhatt (2017) states that the highest side effect of tuberculosis drugs treatment is joint pain that is 21,2% [7] and some even experience paresthesia or tingling at the tip of the toe at 9.09% [8].The incidence of joint pain was 33%. This is also consistent with research conducted by Aini et al. (2015) who reported that 91.67% had joint pain [3]. Paresthesia occurs due to decreased circulation in peripheral tissue due to the peripheral vascular constriction process. According to Oehadian in 2003 TB treatment can also cause disseminated intravascular coagulation which results in thrombosis in blood vessels characterized by peripheral tissue ischemia [9].

Paresthesia and joint pain occur due to taking drugs pyrazinamide and ethambutol. The drug inhibits uric acid excretion causing hyperuricemia [7], this condition causes a buildup of monosodium uric salt in tissues, then recognized by the body's immune system as a dangerous substance, so leukocytes will release arachidonic acid, arachidonic acid and then undergo metabolism through the cyclooxygenase pathway is catalyzed by the cyclooxygenase (COX-2) enzyme which will produce prostaglandins [10,11]. Pain stimulus will be transmitted through delta A and C fibers to the thalamus via the spinothalamic tract to be perceived as joint pain [12]. Joint pain is felt by patients in the first 2 months of OAT treatment [13], but in the study of Sari (2014) states that joint pain is still felt until the 6th month of treatment [14]. Joint pain is a sign of a buildup of uric acid levels and tingling as a sign of disruption of blood vessels. This feeling can interfere with and affect the patient's activities [15], so it is necessary to take appropriate care measures to deal with complaints of joint pain and tingling as a result of not smooth blood circulation.

Management of joint pain and paresthesia can be done through pharmacological and non-pharmacological methods, one of which is complementary therapy including acupressure, aroma therapy, distraction techniques and relaxation techniques including massage therapy [16]. Light massage is a massage therapy in the form of gentle movements in the soft tissues of the body including wiping and rubbing movements, this skin stimulus will provide a sense of comfort, relaxes tension in the muscles and increases blood circulation [17]. Seeing this phenomenon that underlies researchers will conduct research under the title Effect of Light Massage on Peripheral Blood Circulation in Tuberculosis Patients in the Work Area of Sokaraja Public Health Center.

## RESEARCH METHODS

This study used true experiment pre and post control group design. This research design observed twice before and after, the researcher divided the respondent into two groups namely the group that was given light massage therapy as the experimental group and the control group

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without being given any action. The sample of this study was 60 respondents consisting of 30 patients for experimental group and 30 patients for control group. The sampling technique used was simple random sampling. The sample in this study was the subjects who met the inclusion criteria. The inclusion criteria were the respondents with the following conditions: tuberculosis active phase, adults 20-60 years old, get OAT category 1. Exclusion criterion in this study was patient experiencing skin disorders and reject the action of light massage. Blood pressure measurement was carried out by using digital sphygmomanometer and Doppler that was calibrated. The measurement results are recorded in the observation sheet. ABI measurements in the experimental group and the control group were carried out 2 times the measurements before giving therapy and immediately after therapy. The measurement result was recorded in the observation sheet.

## RESULTS

This chapter describes the results of research on the effect of light massage on peripheral circulation of pulmonary TB patients in the Sokaraja region. Based on data obtained during the research process carried out from January to August 2019, a total of 60 respondents were obtained, which included 30 respondents as the treatment group and 30 respondents as the control group. Research data are presented as follows:

1. Characteristics of Respondents.

**Table 1.** Characteristics of Respondents

| **Variable** | **Treatment Group (%)** | **Control Group (%)** |
|---|---|---|
| Gender | | |
| Male | 43,3 | 43,3 |
| Female | 56,7 | 56,7 |
| Treatment phase | | |
| Intensive | 76,7 | 73,4 |
| Continuation | 23,3 | 26,6 |

Table 1 shows the majority of respondents were female and with an intensive treatment phase.

2. **Average of ABI**

**Table 2.** Mean Description of ABI

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| **Variable** | **Treatment Group Mean ± SD** | **Control Group Mean ± SD** |
|---|---|---|
| Pre intervention | 1,04± 0,10 | 1,06 ± 0,11 |
| Post intervention | 1,03± 0,10 | 1,06± 0,07 |

Table 2 shows the treatment and control groups namely the average ABI in the normal range.

3. The Difference ABI score between Pre and Post Intervention in the Treatment and Control Group

**Table 3.** The Difference Test Result of Blood Pressure between Pre and Post Treatment

| Variable | *p value* Treatment | *p value* Control |
|---|---|---|
| ABI | *0,641 a* | *0,845 a* |

a = non parametric, b = parametric

Table 3 shows that the results of the blood pressure difference test in the treatment and control groups showed no significant difference (p> 0.05).

4. Effect of Light Massage on ABI Inter-group Respondents

**Table 4.** Effect of Light Massage on ABI Inter-group Respondents

| Variable | Homogeneity Test | *p value* |
|---|---|---|
| ABI | 0,285* | 0,473* |

*= not significantly different

Table 4 shows that the pre and post ABI data in the treatment and control groups were not significantly different or homogeneous so that the post data between groups could be tested differently. There were no significant differences between the ABI treatment and control groups (p> 0.05).

## DISCUSSION

This chapter explains the discussion of the results of research that has been done. This discussion consists of an interpretation and discussion of the results as well as the relationship between the results of the study with a review of the theory and the results of previous research. This chapter also explains the limitations of research and the implications of research in nursing. The full discussion is explained as follows:

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Table 1 shows the characteristics of respondents in this study. The majority of respondents were female and with active phase treatment. Table 2 shows that the ABI difference test results before and after treatment in the treatment group showed no significant differences (p = 0.641), whereas in the control group also showed no significant differences.

Tuberculosis treatment consists of 2 stages, namely intensive phase which aims to effectively reduce the number of germs in the patient's body. Next is the advanced treatment aimed at killing the remaining germs that still exist in the body and preventing recurrence Treatment with anti-tuberculosis especially Pyrazinamide and Ethambutol have side effects in the form of paresthesia or tingling at the tip of the toe due to impaired uric acid metabolism which causes an increase in uric acid levels in the blood so that it disrupts blood circulation if it takes place in the long term, especially those that get treatment until the advanced phase [8].

The majority of respondents in this study were still in intensive treatment with an average treatment period of 1-2 months. Based on this time if physiologically related side effects have not been seen from the anti-tuberculosis of a small number of patients who say they have been paresthesia, when viewed from the measurement results the majority of ABI values are still in the Normal range (1-1.4)

Table 4. The results obtained by the difference in ABI post-action between the treatment group and the control group showed no significant difference (p = 0.473). Light massage is the use of varying pressures and movements to manipulate muscles and other soft tissues. By relaxing the body's soft tissues, more blood and oxygen can reach the affected area and reduce pain. Massage is a sensory integration technique that affects the activity of the autonomic nervous system. If someone perceives the touch as a relaxing stimulus then the relaxation response will appear provides a relaxing effect. Massage is useful for increasing surface circulation so that it can improve blood circulation in tissues, reduce the workload of the heart, increase circulation, stimulate blood flow throughout deeper blood vessels, accelerate metabolic and nutritional residues, reduce anxiety and depression [18].

The results of previous studies, showed that elderly massage can reduce circulation can improve blood pressure in the elderly hypertension. The decrease is through a body mechanoreceptor which then regulates pressure, touch and warmth into a relaxation mechanism. Mechanoreceptors are cells that convey signals to the central nervous system and transduce mechanical stimuli. Massage performed for 10-15 minutes for 3 days can reduce symptoms of systolic and diastolic blood pressure so that complaints of hypertension sufferers can be reduced [18].

The results of the light massage performed on the face, chest, arms, and legs with light eats and the duration of 3 treatments have not affected the patient's peripheral circulation. Researchers do not thoroughly massage all the muscles of the patients. Perform massage on large muscles in the legs can facilitate blood circulation. When doing massage on the leg muscles, increase the pressure on these muscles gradually to relax the tension so that helps accelerate

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blood flow to the heart. Foot massage ends with massage on the soles of the feet which will stimulate and refresh the foot so that it restores the balance system and helps relaxation [19].

Based on the analysis that the administration of light massage in this study showed no significant differences between the intervention and control groups because the administration of massage was only 3 times the treatment and using light pressure, so that the therapeutic effect was not yet significant. So that further research needs to be done by providing longer therapy and with massage pressure on large muscles that are stronger.

## CONCLUSION

1. The majority of respondents in this study were women with an intensive treatment phase
2. The average ABI value is still in the normal range
3. There is no difference before and after the administration of light massage
4. There were no significant differences in ABI between the treatment and control groups.

## RECOMMENDATION

1. Giving massage therapy to reduce ABI needs to be done regularly and strong pressure on large muscles, especially on the legs and arms.
2. As a recommendation for the development of complementary therapy subject courses especially light massage.
3. Further research is needed with a longer time and modification of massage techniques in the provision of massage therapy to be able to improve peripheral circulation

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