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Article

The Effectiveness of Ear Acupuncture Therapy and Bloodletting Apex in Lowering Blood Pressure for Patients with Hypertension in Ngampon Hamlet, Mojosongo Village

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ABSTRACT

High blood pressure is a disease caused by disorders in the blood circulation system where systolic blood pressure is higher than 140 mmHg and diastolic blood pressure is higher than 90 mmHg. This research aims to determine the effectiveness of ear acupuncture therapy and ear apex bloodletting in reducing blood pressure in patients with high blood pressure in Ngampon Village. The research was conducted from November 2018 to April 2019 in Ngampon Village, Mojosongo Sub-district, Surakarta City. This study involved a sample of 32 subjects who met the inclusion and exclusion criteria (males: 14 and females: 18). The research design was pre-experimental with a one-group pretest-posttest design. Data was collected through interviews/anamnesis and blood pressure observation before and after the intervention. The Wilcoxon test results yielded a p-value of 0.000 < α = 0.05, indicating a decrease in blood pressure after the ear acupuncture therapy and ear apex bloodletting intervention. Ear acupuncture therapy and ear apex bloodletting effectively reduce blood pressure in patients with high blood pressure.

I. INTRODUCTION

An individual is considered to have hypertension when their systolic blood pressure is higher than 140 mmHg, and diastolic blood pressure is higher than 90 mmHg, a condition often undetected early on, earning it the moniker of the "silent killer" [(1,2,3)].The lack of awareness among the Indonesian population regarding the causes of hypertension and the adoption of unhealthy lifestyles contribute to the increasing prevalence of hypertension each year [(1)].

Hypertension ranks as the 10th leading cause of death in Indonesia and represents the highest occurrence among outpatient cases, ranking third in terms of patient morbidity[(4)]. Hypertension still accounts for the largest proportion of all reported non-communicable diseases (NCDs) in Central Java, at 60%. The percentage of hypertension among individuals aged >18 years in Surakarta City is reported to be 19.87% [(5)].

Continuous long-term pharmacological therapy to control blood pressure can lead to adverse side effects for hypertension patients and may result in patient dependence on these medications[6,7]. Various efforts in managing hypertension include alternative (complementary) treatments such as cupping therapy (bekam) and acupuncture[7]. The mechanism of acupuncture therapy in reducing blood pressure in hypertensive patients includes the reduction of plasma renin, aldosterone, and angiotensin II activity, increased sodium secretion, and changes in plasma norepinephrine (NE), serotonin (5-HT), and endorphin levels. Ear acupuncture can influence autonomic nerve function, which is believed to be effective in lowering blood pressure in hypertensive patients[8]. Bloodletting is therapeutic method to address pathogenic conditions by incising capillaries or veins on the skin's surface. Research shows a 62.3% to 94.5% effectiveness rate of bloodletting in reducing blood pressure. The ear apex is one of the acupuncture points on the ear used for bloodletting procedures[10].

Based on the description above, we will conduct a study titled "The Effectiveness of Ear Acupuncture Therapy and Bloodletting Apex in Lowering Blood Pressure for Patients with Hypertension in Ngampon Hamlet, Mojosongo Village".

II. METHODS

Based on the objectives of this research, the research method titled "The Effectiveness of Ear Acupuncture Therapy and Bloodletting Apex in Lowering Blood Pressure for Patients with Hypertension in Ngampon Hamlet, Mojosongo Village" is a Pre-Experimental method without a control group.

The variables in this research include Independent variables, which are ear acupuncture therapy and ear bloodletting apex therapy, and dependent , which are the reduction in blood pressure for patients hypertension in Ngampon Hamlet, Mojosongo Village.

The research design utilizes a pre-experimental design in the form of a one-group pretest and posttest. This design lacks a comparative group (control) but involves conducting an initial observation (pretest) before the intervention and a final observation (posttest) after the intervention.

This research is conducted in Ngampon Hamlet, Mojosongo Village, Surakarta. The research period was from November 2018, after the preliminary study, until the compilation of research results in April 2019. The sampling technique used in this research is the purposive sampling method.

The instrument used to identify respondent characteristics (age, gender, occupation, risk factors, etiology) is a questionnaire. Meanwhile, an observation sheet for blood pressure classification, informed consent, and blood pressure measurement using a mercury Sphygmomanometer and stethoscope are used to identify the reduction in blood pressure.

Before determining the statistical test technique to be used, it needs to be known whether the data is normally distributed or not with a significance value (Asym.sig.) > 0.05 (α: 5%) in the Shapiro-Wilk test or when the data distribution (histogram) follows a normal curve pattern. The data will be analyzed using a paired T-test if the data is normally distributed and a Wilcoxon test if the data is not normally distributed. If the calculated Z value ≥ the tabled Z value or the Asymptotic significance value ≤ 0.05, H0 is rejected, and Ha is accepted.

III. RESULT

Based on Table 1, it is known that out of the total number of 32 research subjects, systolic blood pressure data was obtained with a minimum value of 150 mmHg and a maximum value of 180 mmHg. Meanwhile, diastolic blood pressure ranged from a minimum value of 90 mmHg to a maximum of 100 mmHg.

Table 1. Blood Pressure Values Before Intervention

Systolic Blood Pressure (mmHg)	(n)	(%)	Diastolic Blood Pressure (mmHg)	(n)	(%)
150	2	6.3	90	11	34.4
160	9	28.1	95	4	12.5
165	1	3.1	100	17	53.1
170	16	50.0			
175	1	3.1			
180	3	9.4			

Based on Table 2, it is known that out of the total number of 32 research subjects, systolic blood pressure data was obtained with a minimum value of 130 mmHg and a maximum value of 180 mmHg. Meanwhile, diastolic blood pressure ranged from a minimum value of 80 mmHg to a maximum of 100 mmHg

Table 2. Blood Pressure Values After Intervention

Systolic Blood Pressure (mmHg)	(n)	(%)	Diastolic Blood Pressure (mmHg)	(n)	(%)
130	8	25.0	80	18	56.3
140	12	37.5	90	10	31.3
150	4	12.5	95	1	3.1
160	4	12.5	100	3	9.4
170	2	6.3			
180	2	6.3			

Table 3. The Effect of Intervention on Blood Pressure Reduction

Decrease Systolic (mmHg)	(n)	(%)	Decrease Diastolic (mmHg)	(n)	(%)
0	5	15.6	0	5	15.6
10	3	9.4	5	3	9.4
20	7	21.9	10	17	53.1
25	2	6.3	20	7	21.9
30	14	43.8			
40	1	3.1			

Based on Table 3, it is known that out of the total number of 32 research subjects, data on the reduction in blood pressure ranged from a minimum value of 0 to a maximum of 40. In contrast, the reduction in diastolic blood pressure ranged from a minimum value of 0 to a maximum of 20.

Table 4. Test of Data Normality

Blood Pressure	Characteristics	N	Shapiro Wilk (sign)
Systolic	Before	32	0.001
	After	32	0.001
Diastolic	Before	32	0.000
	After	32	0.000

Based on Table 4, the data that does not meet the Shapiro-Wilk test criteria for normal distribution is when the significance value is >0.05. Therefore, the data is not normally distributed because the significance value is less than 0.05.

Table 5. Wilcoxon Test

Variable	n	Median (minimum-maximum)	p
Systolic blood pressure before therapy	32	170 (150-180)	0,000
Diastolic blood pressure before therapy	32	100 (90-100)	
Systolic blood pressure after therapy	32	140 (130-180)	0,000
Diastolic blood pressure after therapy	32	80 (80-100)	

Based on Table 5, the Wilcoxon test analysis with a confidence level of 95% (α = 0.05) resulted in a p-value of 0.000. Therefore, since the p-value is smaller than the significance value α, < 0.05 (0.000 < 0.05), H0 is rejected, and Ha is accepted. This means that ear acupuncture therapy and ear bloodletting apex effectively reduce blood pressure in patients with high blood pressure.

IV. DISCUSSION

The results of this research will be interpreted and discussed based on theories related to previous research findings. The focus of the research results will be on achieving the research objective, which is the Effectiveness of Ear Acupuncture Therapy and Bloodletting Apex in Lowering Blood Pressure for Patients with Hypertension in Ngampon Hamlet, Mojosongo Village. The research findings obtained are as follows: The results of this study found that ear acupuncture and ear bloodletting apex effectively reduce blood pressure in patients with high blood pressure in Ngampon Hamlet, Mojosongo Village. These findings are consistent with the research conducted by Suryanto, which showed a significant decrease in systolic blood pressure in the research subjects during the treatment ($p < 0.05$). The heart rate frequency also experienced a significant decrease in the research subjects during the treatment ($p < 0.05$)[9]. The correlation test results showed a positive correlation between mean arterial pressure and heart rate frequency ($r = 0.373$). Thus, a single ear acupuncture point leads to a decrease in blood pressure and heart rate frequency. This is supported by the research conducted by Rodiah et al. (2013), which showed significant differences in mean systolic and diastolic blood pressure before and after the intervention in both the ear acupuncture group ($p=0.000$; $p=0.000$) and the body acupuncture group ($p=0.001$; $p=0.000$). This study also showed significant differences in mean serum NO levels before and after the intervention in the ear acupuncture group ($p=0.012$).

In contrast, the difference was insignificant in the body acupuncture group ($p=0.086$). Thus, ear acupuncture and body acupuncture have comparable effects in reducing blood pressure in patients with essential hypertension. However, ear acupuncture shows increased serum NO levels, which acts as a vasodilator. Additionally, these findings are consistent with the research conducted by Kwon et al., which stated that BEA (Bloodletting ear apex) research as monotherapy shows short-term antihypertensive effects. However, the long-term antihypertensive effect of combination therapy with BEA (Bloodletting ear apex) is higher than pharmacotherapy alone[10]. This is also supported by the research conducted by Moawia et al., which showed a significant decrease in systolic blood pressure (SBP) (p-value = 0.01) during three sessions of bloodletting (from 149.2 mmHg to 130.8 mmHg), but less significant for diastolic blood pressure (DBP) during three sessions of bloodletting (p-value = 0.074). This study also stated that the average SBP in the study group was 9.6 mmHg lower than in the control group. Bloodletting can be effectively used to reduce SBP [11].

Acupuncture reduce blood pressure by stimulating acupuncture points to convey and facilitate Qi to balance Yin and Yang. Physiologically, acupuncture can stimulate the regulation of the autonomic nervous system, release endorphins, release prostaglandins in the brain, and cause changes in plasma angiotensin II, which can lead to a decrease in blood pressure[12,13].

Ear acupuncture, known as auricular acupuncture, is a form of micro acupuncture therapy aimed at preventing disease by manipulating and stimulating specific points on the ear using massage, acupuncture needles, or other tools. Ear acupuncture is closely related to meridians and Zang fu and is associated with physiological and pathological functions [14]. The insertion of ear acupuncture needles in cases of high blood pressure affects stimulation and inhibition of the cerebral cortex, balances sympathetic nervous system activation, and sedates the parasympathetic nervous system[15]. Gao (2011) revealed in his research that ear acupuncture can increase heart rate variability and inhibit barriers in the cardiovascular system, enhancing the

response of heart nerves in the nucleus tractus solitaries[16].

Stimulation at ear acupuncture points such as Shen Men (TF 2), located on the upper and middle side of the triangular fossa, between the superior crus and inferior crus boundaries of the antihelix; Heart 1 (IC 4), located on the inner and central part of the inferior concha; Endocrin (IT 2), at the intertragic notch wall; Hypertension 2, located on the inferior tragus. According to Western medical theory, the ear leaf at this location has a distribution of the Vagus nerve, the tenth cranial nerve directly related to visceral organs. It can address vascularization disorders (neurohumoral system) through stimulation by needles, whether physical, chemical, or electrical, affecting hormonal balance activation and serving as a branch of the parasympathetic nerve. Parasympathetic nerve activity inhibits sympathetic nerves as cardioaccelerators, causing systemic vasodilation, facilitating blood circulation throughout the body, and reducing heart rate and contraction force, thereby addressing high blood pressure. Stimulation of the sympathetic nerve increases heart rate, while the parasympathetic nerve has the opposite effect, reducing heart rate due to parasympathetic nerve stimulation to address high blood pressure[17,18].

Bloodletting, also known as "bloodletting acupuncture," is a method for treating diseases and disorders using a prism needle to extract a few drops of blood to improve blood circulation. For hypertension cases, extract 4 to 5 drops of blood, then press the punctured point with a clean wipe to stop bleeding. This method can be performed every two days by puncturing an alternative side each therapy time, recommended for 10 therapy sessions in one treatment session. Bloodletting can stimulate the production and excretion of endogenous nitric oxide, which plays a role in vasodilation and increasing the supply of nutrients and blood needed by the cells and layers of arterial and venous blood vessels, making them stronger and more elastic, resulting in a decrease in blood pressure for patients with high blood pressure[11].

In this study, five research subjects did not experience any decrease in blood pressure. Upon reevaluation, the constraints on some research subjects were attributed to high blood pressure caused by genetic factors exacerbated by a lack of awareness of healthy lifestyle habits such as inadequate rest patterns, improper diet, smoking, and excessive coffee consumption. This is consistent with the opinion of Udjianti (2013) that the lack of awareness among research subjects regarding adopting a healthy lifestyle impedes blood pressure reduction in some research subjects. Environmental and population structure changes, socio-economic factors, unhealthy lifestyles such as consuming high-fat, high-calorie, and high-sugar foods, smoking, lack of physical activity, excessive consumption of alcoholic beverages and coffee, and prolonged emotional stress are suspected of contributing to the failure of blood pressure reduction in some research subjects[1].

V. CONCLUSION

Based on the data analysis above, acupuncture therapy on the ear and bloodletting at the ear apex in patients with high blood pressure in Ngampon Hamlet, Mojosongo Village, with a significance test value 0.000 using SPSS series 23. Ear acupuncture therapy and bloodletting at the ear apex effectively reduce blood pressure in patients with high blood pressure in Ngampon Hamlet, Mojosongo Village. It is hoped that in further research, more research subjects will be used so that a comparative study with a control group can be conducted.

The selection of research subjects can be expanded, and the research location can be extended so that the results can be more effective, and the wider

community can benefit from ear acupuncture therapy and bloodletting at the ear apex in managing cases of high blood pressure. It is hoped that more specific inclusion criteria will be determined to improve homogeneity.

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