



Article

The Effect of Ear Acupuncture Therapy with a Combination of Gotu Kola Tea on Changes in Blood Pressure in Hypertension Cases in Kemandungan Village, Tegal Barat Subdistrict, Tegal City

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ABSTRACT

Hypertension is high blood pressure with systolic values above 140 mmHg and diastolic values above 90 mmHg. Ear acupuncture and gotu kola tea are non-pharmacological treatments that can be used to treat hypertension. The purpose of this study was to determine the effect of ear acupuncture therapy with a combination of gotu kola tea on changes in blood pressure in cases of hypertension in Kemandungan Village, Tegal Barat Subdistrict, Tegal City. This study used a research design "Quasy-Experimental Design" with the method of two groups-pretest posttest design. The number of research subjects was 30 people with a purposive sampling technique, which was divided into a control group (ear acupuncture) and an experimental group (ear acupuncture combined with gotu kola tea brewing). The Mann-Whitney test results obtained a significant value of $p < 0.05$ ($p = 0.014$ and $p = 0.013$) then H_0 is rejected and H_a is accepted so that it can be interpreted that there is an effect of ear acupuncture therapy with a combination of gotu kola tea brewing on changes in blood pressure in cases of hypertension in Kemandungan Village, Tegal Barat Subdistrict, Tegal City with a 6% change in systole and 3% higher diastole than the control group.

I. INTRODUCTION

Blood pressure is the force generated by the heart while pumping blood in the human body that varies naturally and is affected by physical activity, which will be higher during activity and lower at rest. Long-term excessively high blood pressure is referred to as hypertension, which can lead to several serious health problems, such as heart failure and kidney failure^(1,2). Hypertension is called a silent

killer because it is a deadly disease without any symptoms as a warning for sufferers⁽³⁾. The prevalence of hypertension in Indonesia based on Riskesdas 2021 shows that patients aged ≥ 18 years are 34.1%⁽⁴⁾. Hypertension is currently the NCD with the highest percentage of 76.5% in Central Java Province which has a population of 37.49 people. Tegal City alone has 62,588 cases of hypertension with a prevalence of 31.57%^(5,6).

Hypertension is classified by WHO as optimal blood pressure, normal, high normal, mild hypertension, moderate hypertension, severe hypertension and isolated systolic hypertension⁽⁷⁾. According to western medicine, the causative factors of hypertension include genetics, age, alcohol consumption, physical activity, smoking, and nutritional status^(8,9). Hypertension results in a reduction in the ability of the aorta and large arteries to accommodate the volume of blood pumped by the heart (stroke volume), shrinkage of cardiac output, and an increase in peripheral resistance that can lead to various diseases⁽¹⁰⁾.

Hypertension is defined as *Tou Tong* (headache) and *Xuan Yuan* (vertigo) in TCM. The main cause of the disease is usually due to mental injury causing liver Qi stagnation, then liver Yang flaring up resulting in kidney Yin deficiency, and also due to improper diet making the spleen deficient as well as dampness accumulating in the body. Some of the manifestations that may appear in the early stages of the disease are headache, dizziness with impaired balance, insomnia, palpitations, tinnitus, restlessness, and numbness in the limbs. In the later stages, the disease begins to attack the brain, heart and kidneys^(11,12). Acupuncture is widely used to treat hypertension. One type of acupuncture is ear acupuncture which is known to increase Nitric Oxide (NO) levels and improve blood circulation in the area given stimulation so that it can reduce blood pressure⁽¹³⁾. Hypertension can also be treated with non-pharmacological methods, for example with herbal gotu kola tea. Gotu kola leaves contain flavonoids which are antioxidants from centelloside and triterpenoids which have a role as natural antioxidants that can stimulate increased blood flow⁽¹⁴⁾.

II. METHODS

This study used the research design "Quasy - Experimental Design" with the method of two groups - pretest-posttest

design. The number of research subjects was 30 people with a purposive sampling technique, which was divided into a control group (ear acupuncture) and an experimental group (ear acupuncture combined with gotu kola tea brewing). The research was conducted in Kemandungan Village, Tegal Barat Subdistrict, Tegal City.

The variables in this study are ear acupuncture therapy and ear acupuncture therapy with a combination of gotu kola tea brewing as the independent variable, and changes in blood pressure as the dependent variable. The study Instruments used include an ear press needle, sterile cotton, 70% alcohol, kom, nierbeken, tweezers, handscoon, stethoscope, sphygmomanometer, gotu kola teabag, glass and hot water.

The study was conducted by equally dividing the research subjects into two equal groups and carried out 2 times a week for 10 treatments. The research subjects had their blood pressure checked before the intervention. The subjects were treated with ear acupuncture therapy alone and ear acupuncture combined with gotu kola tea for 4 weeks. The ear acupuncture points used in this study were TF2 Shenmen, Hypertension 2, and Heart C2).

III. RESULT

Based on table 1, it is known that blood pressure before treatment in the ear acupuncture group had an average systolic of 159 mmHg and diastolic of 98.2 mmHg.

Table 1. Blood pressure before intervention of ear acupuncture group

Systolic (mmHg)	N	%	Diastolic (mmHg)	N	%
150	6	40.0	95	6	40.0
155	2	13.3	98	1	6.7
160	2	13.3	100	7	46.7
165	1	6.7	105	1	6.7
170	3	20.0			
180	1	6.7			
Mean	159		Mean	98.20	

Table 2. Blood pressure before intervention of ear acupuncture group with gotu kola tea combination

Systolic (mmHg)	N	%	Diastolic (mmHg)	N	%
150	5	33.3	90	2	13.3
155	1	6.7	95	2	13.3
160	1	6.7	98	2	13.3
165	1	6.7	100	6	40.0
168	1	6.7	105	3	20.0
170	2	13.3			
175	2	13.3			
180	2	13.3			
Mean	163.20		Mean	98.73	

Based on Table 2, it is known that the blood pressure before treatment in the ear acupuncture group with a combination of gotu kola tea steeping, the average systolic was 163.20 mmHg and the diastolic was 98.73 mmHg.

Table 3. Blood pressure after intervention of ear acupuncture group

Systolic (mmHg)	N	%	Diastolic (mmHg)	N	%
110	1	6.7	70	1	6.7
115	0	0	75	4	26.7
120	5	33.3	80	9	60.0
125	7	46.7	85	1	6.7
130	2	13.3			
Mean	123		Mean	78.33	

Based on Table 3, it is known that mean after treatment in the ear acupuncture group the systolic is 123 mmHg and the diastolic is 78.33 mmHg.

Table 4. Blood pressure after the intervention group of ear acupuncture with gotu kola tea combination

Systolic (mmHg)	N	%	Diastolic (mmHg)	N	%
110	4	26.7	70	4	26.7
115	2	13.3	75	4	26.7
120	7	46.7	80	7	46.7
125	2	13.3			
Mean	117.33		Mean	76	

Based on table 4, it is known that blood pressure after treatment in the ear

acupuncture group with a combination of gotu kola tea steeping, the average systolic is 117.33 mmHg and the diastolic is 76 mmHg.

Table 5. Mann Whitney Test

Groups	Variable	Mean	p
Group 1	Systole	11.60	0.014
	Diastole	12.00	0.013
Group 2	Systole	19.40	0.014
	Diastole	19.00	0.013

Based on table 5, the Mann Whitney test results show there are changes in systolic blood pressure $p = 0.014 < 0.05$ which means H_0 is rejected and H_a is accepted. Diastolic blood pressure has $p = 0.013 < 0.05$ which also means rejecting H_0 and accepting H_a . The decrease in systolic blood pressure in group 1 averaged 11.60 and diastolic 12.00, while group 2 averaged systolic 19.40 and diastolic 19.00

Table 6. Gradation Score

Group		Blood Pressure (mmHg)			Changes (%)		
		T ₀	T ₅	T ₁₀	T ₀ -T ₅	T ₅ -T ₁₀	T ₀ -T ₁₀
Group 1	Systole	159	134.3	123	15	8	22
	Diastole	98.2	83	78.3	15	6	20
Group 2	Systole	163.2	129.6	117.3	20	9	28
	Diastole	98.7	79.3	76	20	4	23

Based on table 6, the decrease in systolic blood pressure between T₀-T₁₀ in group 1 was 22% and in group 2 was 28%. In diastolic values, there was a decrease in group 1 by 20% and group 2 by 23% obtained from the difference between T₀ and T₁₀

IV. DISCUSSION

Hypertension in TCM belongs to the group of Tou Tong (headache) and Xuan Yuan (vertigo). The main cause of this disease is usually due to mental injury that causes stagnation of liver qi, then the liver's yang is flared up making the kidney yin deficient, and also due to improper diet

making the spleen deficient and moisture accumulated in the body⁽¹²⁾.

The basic theory of ear acupuncture states that the ear represents the entire human body, including its internal organs which are depicted with an inverted fetus in the womb. The benefits of ear acupuncture are believed to treat organ disorders and relieve and even eliminate pain⁽¹⁵⁾. Acupuncture points on the ear are used to relieve various pathological conditions. Ear acupuncture is known to increase Nitric Oxide (NO) levels and improve blood circulation in the stimulated area⁽¹³⁾. Ear acupuncture affects the activity of the cerebral cortex, regulating the balance between the sympathetic nervous system and the parasympathetic nervous system in cases of hypertension⁽¹⁶⁾.

The main benefit of using TF2 Shenmen is to reduce stress, pain, tension, anxiety, depression, sleep disorders, restlessness, and oversensitivity. TF2 Shenmen also acts as an important point in the detoxification process from dependent drugs and in the treatment of alcoholism, as well as aiding in the management of coughs, fever, inflammatory diseases, epilepsy, and high blood pressure⁽¹⁷⁾. Hypertension 2 points are used specifically to treat hypertension, while Heart C2 can help in cases of arrhythmia, palpitations, angina pectoris, post-heart attack symptoms, and high and low blood pressure^(15,18).

The main components in gotu kola leaves that can reduce blood pressure are flavonoids, contained in centellacoside, and triterpenoids which function as natural antioxidants. Antioxidants contained in gotu kola leaves can stimulate collagen

production and tissue regeneration, thus improving blood flow by strengthening the walls of blood vessels. Certain flavonoids contained in gotu kola such as quercetin and kaempferol, work by stopping the conversion activity of Angiotensin Converting Enzyme (ACE) I into ACE II. This causes blood vessels to dilate, lowers endothelin-1 levels which acts as a vasoconstrictor and reduces peripheral resistance resulting in lower blood pressure⁽¹¹⁾. Gotu kola is also effective in lowering blood pressure because it has a diuretic effect that increases the excretion of water, sodium, and sodium through the kidneys, then decreases plasma volume and results in less blood pumped by the heart, thus reducing blood pressure. Gotu kola also has an antidepressant effect that can lower blood pressure by providing a calming effect on hypertensive patients⁽¹⁴⁾.

V. CONCLUSION

The change in systolic blood pressure based on the Mann-Whitney test had a p-value of $0.014 < 0.05$ and a diastolic p-value of $0.013 < 0.05$, which means that the alternative hypothesis (H_a) is accepted and the null hypothesis (H_0) is rejected. The average percentage change in blood pressure in this study was 22% systolic and 20% diastolic for Group I (ear acupuncture), while Group II (ear acupuncture combined with Centella Asiatica tea infusion) showed a 28% change in systolic and 23% in diastolic. This study concludes that ear acupuncture therapy combined with Centella Asiatica tea infusion has an effect on blood pressure changes and is more effective compared to single ear acupuncture therapy.

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