

Effect of Backshu point Massage on Cardiovascular functions in Primary Hypertension –A Randomized Crossover Study.

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Abstract:

Background: Hypertension is one of the most pervasive no communicable disease in developing countries like India. A long term stress response is one of the main causes of essential or Primary hypertension. Backshu Point massage (BSPM), a treatment of TCM uses massaging the Backshu acupuncture points which elicit relaxation that alters the course of unchecked stress response. The aim of the study is to evaluate the effect of BSPM on Cardiovascular functions in patients with Essential Hypertension.

Materials and Methods: 30 Primary Hypertension patients with the age group of 35-45 years of both genders were recruited and randomly divided into 2 groups. Subjects of both the group underwent 40 minutes of each BSPM (study session) and Supine Rest (control session) session in 2 different orders. In the first group , 15 subjects underwent BSPM on day.1 & SR on day.2, while in second group the order of intervention was reversed. Assessments such as Systolic Blood Pressure(SBP),Diastolic blood pressure(DBP) , Pulse rate (PR), Pulse Pressure (PP) and Mean Arterial Pressure (MAP) were taken before and after each session. Statistical analysis was performed using Statistical package for social sciences version 16.0.

Results: The result of this study showed a significant difference between 2 sessions in all variables ($p < 0.05$). Within group analysis showed a significant reduction in SBP, DBP, PR, PP and MAP in BSPM group when compared to their respective baseline. There were no changes observed in control session.

Conclusion: The result of this study suggest that 40 minutes of BSPM is an effective therapy in improving cardiovascular functions in Primary hypertensive subjects

Key Word: Backshu point massage (BSPM), Primary hypertension, cardiovascular function, Traditional Chinese medicine

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I. Introduction

Essential or Primary Hypertension is the most common cardiovascular disease (CVD), affecting about one billion individuals worldwide. Hypertension (HTN) exerts a substantial public health burden on cardiovascular health status and healthcare systems in India [1] It is a common disease and a major risk factor for coronary artery ischemia and stroke. Overall prevalence of hypertension in India is 29.8% with a range of 25% of urban and 10% of rural subjects.[2] An Indian epidemiological study reported that 70% of these would be Stage I hypertension (systolic BP 140–159 and/or diastolic BP 90– 99 mmHg). The Stage I hypertension (45.5 million subjects) can be managed initially by lifestyle measures [3] However, hypertension continues to be either untreated or uncontrolled in most individuals. Approximately one-half of the patients with high blood pressure (BP) are not compliant with drug therapy for various reasons including treatment cost, adverse effects, and complications. [4]

According to Traditional Chinese medical theory primary hypertension tends to be closely associated with an individual's constitution such as hyperactivity of yang, phlegm dampness and yin deficiency, and may also involve excess or deficiency of the internal organs. An improper diet pattern or insufficient exercise impairs the transportation and transformation function of the Spleen and produces pathogenic dampness within the body. Dampness causes stagnation obstructs the flow of qi, while the consumption of yin leads to an exuberance of yang leading to complete malnourishment of the organs. All of these pathological mechanisms including emotional changes causes hypertension. [5]

In our body there are a set of acupuncture points along the Urinary Bladder channel that is considered to have the property of stimulating specific organs and their functions. They are called as BackShu Points [BSP] or

transporting Points [6]. These located on the first line of the Urinary Bladder [UB] Meridian of Foot-Taiyang on the back, 1.5 cun lateral to the Du Meridian which runs in the middle of the spine. [7] In these points the Qi of Du channel communicates with UB channel. This demonstrates a close relationship between the Back-shu points and the spinal ganglia. Stimulating techniques like acupuncture, moxibustion and massage can be applied on these points to relieve or cure from disorders of their corresponding organs and to regulate ANS activity. [8]

Acupuncture has been widely used in TCM to reduce high blood pressure. There are many studies describing needling at body acupuncture points [9], electro acupuncture [10] and auricular acupuncture [11] for reducing blood pressure in hypertensive patients. There is lack of study on effect of Back Shu points for hypertension. Hence the aim of the study is to evaluate the immediate effect of Back Shu Point Massage on Cardiovascular changes in essential Hypertension patients.

II. Material And Methods

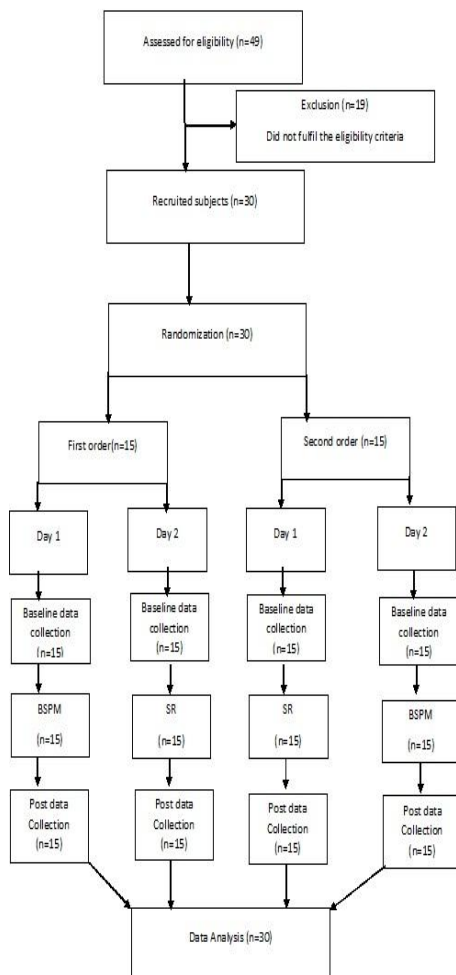
49 Essential hypertension patients attending Out Patient Department of Govt. Yoga and Naturopathy Medical College and Hospital were screened for the study based on the Criteria. 30 patients out of 49 fulfilled the eligibility criteria and are recruited for the study.

Study Design: A Randomized Crossover Study.

Study Location: Govt. Yoga and Naturopathy Medical College & Hospital, Anna hospital campus, Tamil nadu, Chennai-106.

Subjects & selection method: This study is a Randomized Crossover trial. After obtaining an informed written consent from the recruited patients, they were randomly divided into 2 groups. The subjects of both group underwent 40 minutes Back Shu point Massage (BSPM) [study session] and supine rest (SR) [control session] in 2 different orders. In the first group 15 subjects underwent BSPM on Day 1 and SR on day 2 while the order was reversed in second group. Baseline and post assessment were performed before and after each session.

Trail profile:



Inclusion criteria:

- (i) A diagnosis of primary hypertension by a physician; a baseline systolic BP of 140–170mmHg
- (ii) Both gender of age between 35-45 yrs.
- (iii) Willing to participate in the study.

Exclusion criteria:

- (i) Suspected acute stroke, Chest tightness & pain of Cardiac Origin
- (ii) Ingestion of short acting Antihypertensive drugs within 2 hours prior to the beginning of study.
- (iii) Any skin disease in the massage area (back)
- (iv) Pregnancy & Lactation
- (v) No specific diet.

Procedure methodology

Study session: The subjects were asked to lie on prone position on a massage table. A gentle massage with movements of stroking, friction and thumb kneading was done on the mentioned Back Shu acupuncture points (Table 1) for about 40 minutes.

Table 1. Description of Back Shu Acupuncture points.

Back shu point	Location	Connected zangfu organs	Action /function
UB.13 FEISHU	1.5 cun lateral to the posterior midline, on the level of lower border of spinous process of T3 vertebra.	Lung	Tonifies, Descends lung qi and Clears heat from lung
UB.14 JUEYINSHU	1.5 cun lateral to the posterior midline, on the level of lower border of spinous process of T4 vertebra.	Pericardium	Unbinds the chest qi and regulates it
UB 15 XINSHU	1.5 cun lateral to the posterior midline, on the level of lower border of spinous process of T5 vertebra.	Heart	Removes blood stasis from chest, clears fire.
UB16 DUSHU	1.5 cun lateral to the posterior midline, on the level of lower border of spinous process of T6 vertebra.	Governing Vessel(Du Mai)	Unbinds the chest and regulates Qi in thorax and abdomen
UB17 GESHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of T7 vertebra.	Diaphragm& Tonification point of Blood	Cools blood heat, removes blood stasis, nourishes and harmonises blood.
UB18 GANSHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of T9 vertebra.	Liver	Cools fire, Clears damp heat and regulates liver blood stasis.
UB 19 DANSHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of T10 vertebra.	Gallbladder	Clears Damp Heat from liver and Gallbladder.
UB 20 PISHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of T11 vertebra.	Spleen	Holds and nourishes blood, transforms Dampness
UB21 WEISHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of T12 vertebra.	Stomach	Eliminates Dampness and Food Stagnation.
UB22 SANJIAOSHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of L1 vertebra.	Triple Burner	Opens the water passages and promotes urination.
UB23 SHENSHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of L2 vertebra.	Kidney	Tonifies and benefits the Essence Qi, Strengthens the back.
UB24 QIHAISHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of L3 vertebra.	Sea of Energy	Regulates blood to lower burner
UB25 DACHANGSHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of L4 vertebra.	Large Intestine	Regulates intestines and promotes Qi flow
UB 26 GUANYUANSHU	1.5 cun lateral to the posterior midline , on the level of lower border of spinous process of L5 vertebra.	Gate of origin (Lower lumbar)	Regulates back , rectifies kidney deficiency.
UB27 XIAOCHANGSHU	1.5 cun lateral to the posterior midline , on the level first of Sacral foramen	Small Intestine	Drains dampness and Dampheat, Regulates water passages.
UB 28 PANGGUANGSHU	1.5 cun lateral to the posterior midline , on the level second of Sacral foramen	Urinary Bladder	Clears Damp heat from lowerburner, Removes stagnation of blood.
UB 29 ZHONGLUSHU	1.5 cun lateral to the posterior midline , on the level 3 rd of Sacral foramen	Central spine (sacrum)	Expels cold, Regulates Lower Burner
UB 30 BAIHUANSHU	1.5 cun lateral to the posterior midline , on the level 4 th of Sacral foramen	White Circle (Anus)	Eliminates Damp heat from lower burner.

Control session: The subjects underwent Supine Rest (SR) for about 40 minutes. They were not given any acupuncture point massage.

Statistical analysis

The statistical analysis of baseline and post data was performed using students paired sample t test with the use of Statistical package for the social sciences (SPSS) for window version 16.0. *p* value <0.05 was considered as significant.

III. Result

Out of 49 subjects assessed for eligibility, 30 patients were included in study based on inclusion & exclusion criteria. The results of this study showed a significant reduction in SBP, PR, DBP, PP and MAP (table.2) in study session (BSPM), while there is no significant change observed in control session (SR). There were no adverse effects reported by the subjects during study (BSPM).

Table no 2: Baseline and Post-test assessment of study session (BSPM) and control session.

VARIABLES	STUDY SESSION (BSPM)			CONTROL SESSION(SR)		
	Baseline data(Mean ± S.D)	Post data(Mean ± S.D)	<i>p</i> -value	Baseline data(Mean ± S.D)	Post data(Mean ± S.D)	<i>p</i> -value
SBP (mmHg)	156.6±6.8	133.5±6.5*	≤0.05	157.13±5.13	156.16±5.25	0.001
DBP (mmHg)	87.5±4.75	83.8±2.01*	≤0.05	87.43±3.99	86.3±3.42	0.020
PR (beats/min)	83.3±1.12	80.5±1.16*	≤0.05	83.7±1.2	83.9±2.0	0.670
PP (mmHg)	68.6±7.29	49.6±6.96*	≤0.05	69.7±7.27	69.8±7.10	0.828
MAP (mmHg)	110.36±4.41	100.3±2.46*	≤0.05	110.6±2.83	109.6±2.46	0.001

Note : SBP – Systolic blood pressure, DBP- Diastolic blood pressure., PR- Pulse rate., PP- Pulse pressure., MAP- Mean arterial pressure.* *p* value < 0.05 (compared within session)

IV. Discussion

The variables such as SBP, DBP, PR, PP and MAP are known as best predictors of cardio vascular risk among hypertensive subjects. The results of this study showed a significant difference in all variables between sessions. There was a significant reduction of SBP,DBP,PR,PP & MAP in study session compared to the baseline, while there was no such changes in Control session .This suggests that 40 minutes of BSPM is effective in improving Cardiovascular function in hypertensive subjects. The possible mechanisms of the effects of BSPM on the cardiovascular system is due to the excitation of somatic afferent input, activating sympathetic inhibitory systems in the brain related to endogenous opioids, nociceptin, γ -aminobutyric acid, and serotonin.[13]

Huang,H et al., stated that by stimulating Backshu points along with other acupuncture points changed the level of BP modulators such as endothelin-1,4 renin,5 aldosterone,6 and angiotensin [14] The neuroanatomy has confirmed that there are spinal nerve branches in both sides of the spine where Back-Shu acupoints are located, and there are sympathetic trunk, sympathetic paravertebral section and the gray and white communicating branches associated with spinal nerve in the deep areas. Therefore, massaging Back-Shu acupoints can not only effectively adjust the disorders of autonomic nervous function and the superficial micro-circulation system, but also stimulate the internal organs to regulate nerves and the function of body fluids[15]

According to cutaneous visceral reflex, the stimulation of Backshu point can regulate and control various autonomic functions. Massaging the backshu point awakens the cutaneous visceral reflex and this causes regulation of Internal Homeostasis like regulating blood pressure. [16] Massaging the Back-Shu acupoints can also regulate the imbalance of the organs function, and it can remove depression and calm mind as well as tonify deficiency to restore health qi, so that qi and blood are regulated and mind is calmed. Hence the main cause for Primary hypertension i.e. obstruction or deficiency of Qi can be restored. [17]

During BSPM , there will be increase in parasympathetic activity i.e. Vagal tone (which is an indicator of parasympathetic activity)which denotes the regulation of blood pressure.[18] These possible mechanism works in reducing SBP, DBP, PR, PP and MAP by Back shu acupuncture point massage. In control session, none of the variable showed significant changes. It indicates that lying down in supine posture on a table does not have a significant impact on the parameters.

Result of present study suggests that BSPM is effective in improving cardiovascular functions in primary hypertension subjects who are at risk of developing CVD. Since this intervention improve various functions like reducing BP, PR, PP and MAP, it might be useful in patients with coronary artery disease and cardiac failure. However further studies are required to evaluate the effect on the above mentioned clinical conditions.

V. Conclusion

The results of this study suggest that 40 minutes of Backshu acupuncture points is effective in improving cardiovascular functions in primary hypertensive patients. Hence BSPM can be used as a complementary therapy in reducing high blood pressure.

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