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EFFECT OF GANJI TURMERIC BATH ON HEART RATE VARIABILITY ON PRIMARY HYPERTENSION

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ABSTRACT

Background: Hypertension is one of the most important risk factors for both coronary artery disease and cerebrovascular accidents which can lead to cardiac hypertrophy and potentially heart failure. Hydrotherapy, formerly called hydropathy and also called water cure is a part of alternative medicine, in particular of naturopathy, occupational therapy and physiotherapy, that involves treating of various diseases using water. In this study we see the comparative effect of ganji turmeric bath in Primary hypertensive individuals. **Methods:** A total of 30 subjects were required for the study, with a mean age group of 30 to 75 years. Subjects who fulfilled the inclusion criteria were included in research. Informed consent form was administered in English. All 30 subjects were given ganji turmeric bath. Assessments were made before and after the intervention. **Results:** Although results of the group have shown some changes, variables MEAN RR, RMSSD, NN50 is under consideration are significant as p. value < 0.05. Whereas, other variables like MEAN HR, LF are not significant as p. value >0.05. **Conclusion:** The Ganji turmeric bath has shown parasympathetic dominance and can be used in the treatment of hypertensive individuals.

KEYWORDS: Primary Hypertension**,** ganji turmeric bath.

INTRODUCTION

Hypertension (HTN or HT), also known as high blood pressure (HBP), is a long term medical condition in which there is persistently elevated blood pressure in the arteries.[1] Blood pressure is expressed by two measurements, the systolic and diastolic pressures, which are the maximum and minimum pressures, respectively.[2] For most adults, normal blood pressure at rest is within the range of 100–130 millimetres mercury (mm Hg) systolic and 60–80 mm Hg diastolic.[3] For most adults, high blood pressure is present if the resting blood pressure is persistently at or above 130/90- or 140/90-mm Hg.[4] Hypertension is basically classified into primary(essential) hypertension and secondary hypertension.[5]

Primary hypertension though it it has no direct cause has many factors such as sedentary lifestyle, stress, obesity, hypokalemia, alcohol intake, vitamin D deficiency, smoking, excess salt in diet which may be the causative factors.[6,7] Inherited genetic mutations and having a familial history of hypertension and aging also increases the risk factor. Many conditions that affects kidneys, arteries, heart or endocrine and birth control pills causes secondary hypertension also adrenal gland cancer, preeclampsia, hypothyroidism and hyperthyroidism may also add to those factors.[8,9,10] The first step in management of hypertension alongside pharamcotherapy is lifestyle modification as mentioned by Eighth Joint National Committee (JNC). the suggested modifications include dietary changes (intake of vegetables, fruits and whole grains including legumes, and restriction of salt, sugars, red meat, trans fats, alcohol and smoking) and physical activity.[11] Unfortunately, the drug regimes available are by no means ideal. They cause major side effects in many patients, risk of dangerous consequences and a shortened life span, so it's better to approach alternative and complementary medicine through naturopathy which includes life style changes, diet and other modalities. In this light, the emergence of colour therapy a safe, effective and inexpensive treatment for mild to moderate hypertension is most encouraging both for doctor and the community at large. The effectiveness of colour therapy in lowering the elevated blood pressure levels of hypertensive patients has been validated in numerous clinical studies.

A measure of cardiac autonomic control. Autonomic imbalance is reflected in measures of heart rate variability (HRV).[12] Heart rate variability (HRV) is a result of the influence of the autonomic nervous system on the heart. Beat to beat fluctuations in the heart rate are

mainly determined by the activity of the cardiac sympathetic and parasympathetic systems. Reduced variability in heart rate reflects autonomic imbalance.[6] Autonomic imbalance is seen in hypertensive individuals hence HRV is used as a parameter.

METHODOLOGY

A total 30 subjects from In-patients department of Sri Dharmasthala Manjunatheshwara Yoga and Nature cure Hospital, Shanthivana, with the age of 30-65 were required for the study. Subjects who fulfilled the inclusion criteria were appraised the purpose of the study and their rights as the research subjects. The ethical clearance was obtained from the institutional ethical committee and consent was taken from all the subjects recruited.

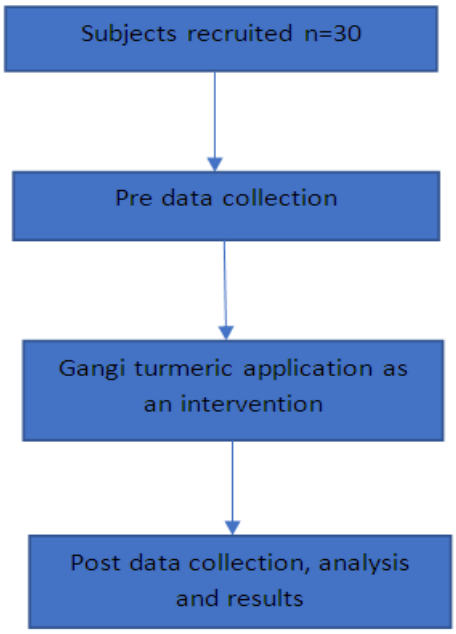
Inclusion criteria

- Patients with primary hypertension.
- Age group: 30-75years
- Gender: male/female
- Willing to give signed informed consent form for participation in the study.
- Patients under medication for hypertension

Exclusion criteria

- Patients with secondary hypertension.
- Patients suffering with IHD, liver and lung diseases, neurological disorders
- Cancer, DM, hypothyroidism, IBD and psychiatric disorders.
- No history of recent surgery, cerebrovascular accident/ stroke, spinal cord injury and disc herniation.

Study design



Assessment

Heart Rate Variability (HRV): HRV was derived from heart rate measures collected using electrocardiogram (ECG) data from Burdick Vision Holtermonitors. Heart rate variability is an index of beat-to-beat changes in the heart rate. The clinical relevance of heart rate variability was first appreciated in 1965 by Hon and Lee. Heart rate variability (HRV) represents one of the most promising markers of autonomic activity. The electrocardiogram [EKG] was recorded using standard bipolar limb lead II configuration and an AC amplifier with 1.5 Hz high pass filter and 75 Hz low pass filter settings (BIOPAC, Montana, USA; model No: BSL 4.0 MP 36). The R waves were detected to obtain a point event series of successive R-R intervals, from which the beat-to-beat heart rate series was computed. The data recorded was visually inspected off-line and only noise free data was included for analysis.

Blood pressure: Systolic and diastolic blood pressure was recorded at baseline and immediately after the intervention of ganji turmeric bath by using sphygmomanometer. It consists of an inflatable cuff, a measuring unit and a mechanism for inflation which may be manually operated electrically. Mercury sphygmomanometers are considered the gold standards they show blood pressure by affecting the height of a column of mercury, which does not require recalibration. Because of their accuracy that are often used in clinical trials of drugs and in clinical evaluation high risk patients.

Intervention: Ganji turmeric bath is prepared by mixing hot rice gangi with a powder of turmeric in 1:4 ratio. Subjects were made to stand comfortably and the prepared ganji turmeric paste was applied on the subject's body by the well trained therapist, excluding the eyes, nose, ear and genitals. After the application of ganji turmeric paste, allow the body to get dry for 30 minutes. After 30 minutes subjects were asked to take cold shower, later the data was collected.

RESULTS

This study was done to evaluate the effect of ganji turmeric bath on autonomic variables in individuals with primary hypertension. The data obtained was analyzed for normality by using shapiro wilk test. The pre-post data of subject group were analyzed using paired t- test analysis.

The results of the pre-post data were compared, analysed and given below:

We observe that the pre and post-measurement of the variables MEAN RR, RMSSD, NN50 is under consideration are significant at the 5 percent level of significance as $p< 0.05$. whereas, other variables like MEAN HR, LF are not significant at the 5 percent level of significance as p. value is more than 0.05.

There is also significant decrease in SBP, DBP and PR.

	Variables	Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	SBP_PRE - SBP_POST	3.10	5.57	1.02	1.02	5.18	3.050	29	.005
Pair 2	DBP_PRE - DBP_POST	-0.20	6.82	1.25	-2.75	2.35	-.161	29	.874
Pair 3	PULSE_PRE - PULSE_POST	1.90	7.60	1.39	-.94	4.74	1.369	29	.181
Pair 4	MEANHR_PRE - MEANHR_POST	-.23300	4.72651	.61019	-1.45399	.98799	-.382	59	.704
Pair 5	MEANRR_PRE – MEANRR _POST	473.69833	352.14380	45.46157	382.72994	564.66672	10.420	59	.000
Pair 6	RMSSD_PRE - RMSSD_POST	-39.97000	55.40476	7.15272	-54.28257	-25.65743	-5.588	59	.000
Pair 7	NN50_PRE - NN50_POST	122.59517	86.19951	11.12831	100.32747	144.86286	11.017	59	.000
Pair 8	HF_PRE - HF_POST	-16.06517	24.50384	3.16343	-22.39518	-9.73515	-5.078	59	.000
Pair 9	LF_PRE - LF_POST	2.03350	18.20626	2.35042	-2.66968	6.73668	.865	59	.390

DISCUSSION

The main aim of the study was to evaluate the immediate comparative effect ofganji turmeric bath on primary hypertensive individuals on the autonomic variables of the subject i.e., heart rate variability, pulse rate and blood pressure. All the 60 subjects underwent the intervention for the duration of 15 minutes. There were no dropouts as well as any side effects after the treatment. Assessments were done 5 min prior and 5 min immediately after the intervention. The present study showed that the pre and post-measurement of the variables MEAN RR, RMSSD, NN50 is under consideration are significant at the 5 percent level of significance as $p< 0.05$. whereas, other variables like MEAN HR, LF are not significant at the 5 percent level of significance as $p> 0.05$**.** there is significant reduction in the both systolic and diastolic blood pressure. The probable mechanism of action indicating a parasympathetic dominance might be due to peripheral vasodilatation following an exposure to cold temperature, could be thermic and chemical in origin.[13] Hence in our study superficial cold receptors could have played a role is increasing parasympathetic activity. The resulting increase in central pressure in turn activates the baroreflex, responsible for reducing sympathetic nerve activity while shifting autonomic heart rate control towards a parasympathetic dominance.[14] Cold temperature plays a large role in the increased peripheral vasoconstriction with enhanced central blood volume.[15] A Significant reduction in local blood volume was found for cold gel pack in healthy ankles. This reduction was attributed to pack's temperature.[16] Cold temperature initially causes skin vasoconstriction, and if a ganji turmeric application covers a large area of the body, a significant amount of blood will be driven into the internal organs. Prolonged cold causes a secondary reaction, inducing vasodilatation of the surface skin blood vessels[17], also enhances peripheral circulation, increases metabolic rate, and hence helps reduce blood glucose levels.[18]

One of the physiological defences for preventing a decrease in core temperature during cold exposure is a greater rate of metabolic heat production induced by shivering and non-shivering thermogenesis.[19] Although this may be perceived as beneficial in the context of minimizing heat dissipation during cold exposure, also associated with marked impairments in vascular responsiveness to cold. This was best evidenced by Stansberry and colleagues[20] who showed reductions in the contribution of local, reflex, and centrally-mediated mechanisms which can determine skin blood flow. Furthermore, this blunted responsiveness is at least in part attributed to the reduction in the control of blood vessel diameter by the sympathetic nervous system.[21]

Limitation of the study is small sample size.

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