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COMPARITIVE STUDY OF IMMERSION BATH WITH EPSOM SALT ON HYPERTENSION

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ABSTRACT

Neutral immersion bath has been extensively used by naturopathy physicians in the management of hypertension but along with Epsom salt have not been studied. Subsequently this study was done to survey the prompt impact of full immersion bath on blood pressure and heart rate changeability, and in this manner to substantiate the clinical understanding of its impact in hypertensive people. Pre diagnosed 20 hypertensive subjects were randomly allocated into case and control groups who received full immersion bath and supine rest respectively for 20 minutes and were assessed for BP immediately in pre and post intervention periods. Results of the full immersion bath with Epsom salt, indicates the sympathetic withdrawal with the simultaneous parasympathetic activation shifting the sympathovagal balance towards parasympathetic dominance thereby supporting the use of full immersion bath with Epsom salt in the management of hypertension.

INTRODUCTION

Hypertension includes a worldwide effect on human quality of living and the health-care framework. Hypertension is caused by an assortment of interconnected variables. It influences one-quarter of the world's grown-up populace, and this number is anticipated to rise to 29 percent by 2025. Early markers of the disorder are often present some time recently Blood pressure elevation is consistent. Hence, high BP cannot be assembled completely by particular BP levels, the progression is unequivocally related with structural and functional cardiac and vascular anomalies in which the individual encounter vascular harm before they get satisfactory treatment, thereby harm to the heart, blood vessels, brain, kidneys and indeed other organs. It can moreover lead to early event of different infections and indeed death. As a result of progressed diagnosis and administration of high blood pressure, hypertensive emergencies are getting to be less common. In any case, its advance needs prompt

administration with appropriate treatment agreeing to the seriousness of the blood pressure levels and the associated signs that are appeared clinically. Following findings of extreme hypertension, target organ injuries must be inspected in advance. With age, the disease's predominance and defenselessness to complications increases.

Due to its high prevalence and related risks of cardiovascular and renal disease, high blood pressure is considered to be a significant public health issue around the world. It has been listed as the major cause of death and the third major cause for shortened years of life due to disability, so it should be considered as a measure of preventing this condition before it occurs, diagnosing the high BP, treating it and regularly monitoring the BP.

A 2mm Hg drop in the population's average DBP could result in a 17 percent lower in hypertension, a 6 percent lower in coronary heart disease, and a 15% lower in stroke.

There are numerous therapies available for treatment of hypertension. The first line of treatment for high blood pressure is preventing it by a healthy life style such as doing some physical exercise, making changes in one's diet such as decreased salt intake, increased potassium intake, weight control, and avoidance of alcohol and which have shown to reduce blood pressure. If hypertension is high enough to justify immediate use of medications i.e. beta blockers, diuretics and the healthy life style change is still recommended in conjunction with medication. But large segments of these population are either untreated or inadequately treated.

Complementary and alternative medication (CAM) a bunch of assorted health care systems which can be utilized as an adjunctive or as an independent methodology in treating and avoiding different ailments will be accommodating within the present scenario, the mindfulness towards complementary and alternative framework of medicine has been increased because it incorporates a potential part in anticipation and administration of life style disorders. And the individuals find these health care choices to be more indistinguishable with their possess convictions, values and philosophical orientations towards their wellbeing and life.

Alternative system of medicine as one of the classifications under CAM which includes Traditional Chinese Medicine, Ayurveda, Siddha, Naturopathy and homeopathy. Naturopathy could be a distinct system of primary health care and anticipation of ailment based on the principles. The various therapeutic modalities of naturopathy are manipulative therapy, mud therapy, magneto therapy, acupuncture, diet and fasting therapy, hydrotherapy, yoga therapy, physical therapy and rehabilitation, which uses healing properties of panchamahabhoothas i.e., earth(prithvi), water(ap), fire(tej), air(vayu), space(akash). Thus, the high blood pressure can be controlled and the improvements attained can be maintained by following the same principles. Naturopathy and yoga therapy can be considered as an important non pharmacological approach in treatment of hypertension.

METHODOLOGY

Subjects: 20 hypertensive individuals and age extending between 30 to 50 years were enlisted.

Description of the subjects including the sample population

Hypertensive individuals from S.R.K NATURE CURE HOSPITAL, Tamil Nādu were recruited for the study.

Ethical consideration:

Earlier to consider, endorsement was gotten from organization ethical committee. A marked informed assent was gotten from the subjects by clarifying the consider goals, strategies, intervention and all the rights of the subject relating to the consider both in verbal and written form.

Inclusion criteria

- Age: 30 – 50 yrs.
- Males and females are involved
- Subjects with systolic blood pressure (SBP) ≥ 140mmHg and/or a diastolic blood pressure (DBP) ≥ 90 mmHg; with or without hypertensive medication

Exclusion criteria

- Subjects diagnosed with pericarditis or myocarditis, valvular heart disease, evidence of heart failure with ejection fraction ≤ 35%, acute coronary syndrome, previous coronary artery bypass grafting, Percutaneous Transluminal Coronary Angioplasty with or without stenting, history of stroke, thyroid abnormalities; chronic renal failure.
- Subjects with open wounds.
- Diabetes mellitus associated with hypertension
- Secondary hypertension

STUDY SETTING

Setting for assessments and interventions

The study was executed at, S.R.K nature cure hospital, for both the groups. The subjects will be considered for the study after screening as per the demands of inclusion and exclusion criteria. The detailed instructions and guidance were provided to practice the intervention

Design

Randomized controlled trial

20 hypertensive people were haphazardly distributed into two groups by computer created randomization. Group 1 received NIB with Epsom salt added to the water and for Group 2 subjects were on supine rest lying in empty full immersion bath tub. All the subjects were surveyed 5 minutes before, and 5 minutes after the treatment.

Blood pressure

Blood pressure was recorded before and after the intervention by using a standard mercury sphygmomanometer, auscultating over the left brachial artery. The systolic pressure and diastolic pressure were noted.

INTERVENTION

General description about Neutral immersion bath

The full bath was administered in an immersion bath tub, which may be made of wood, or may be improvised in a number of ways. The tub should be an inch and a half thick, planned smooth on both sides. The tub should be about six feet in length, two feet in width, a foot and half in depth. The patient was made to drank one or two glasses of water before the treatment. The Tub was filled with water of 250 litres approximately and 200g of Epsom salt (magnesium sulphate) was added to it. Temperature of the water in the tub was measured by hydratic thermometer (water thermometer).

The subject was asked to be in minimal dress and made to lie down in supine position on the tub, a cold compress to the head was applied with head placed out of the tub for about 20 mins. The temperature was maintained at 92^0 to 95^0 F (34^0 C) throughout the session. After the bath, the patient was made to dry themself quickly.

Temperature: Neutral immersion bath: 92^0 to 95^0 F (34^0 C)

Materials used

- Sphygmomanometer.
- Full immersion bath tub.
- Water of required temperature.
- Epsom salt.

RESULT

The study was done to evaluate the quick impact of neutral immersion bath with epsom salt in hypertensive people. The information obtained was analyzed for ordinariness by utilizing Kolmogorov Smirnov test. The pre, posttest information of case and control groups were analyzed independently by using paired t test and comparative investigation between the group 1 and group 2 were done by using Mann-Whitney U test and Wilcoxon matched pairs tests.

In case group there were 20% of males and in control group there were 10% of males.

The results of the pre-post comparisons for both the groups are detailed below:

Case group: There was a significant decrease in SBP (p=0.0001) but the reduction in DBP (p=0.001) no significant changes **Control group:** In control group, there was no significant decrease in SBP and DBP.

Overall, immersion bath with Epsom salt shows parasympathetic dominance.

SUMMARY OF DATA ANALYSIS

Table: Comparison of post- test values of case and control group

Variables	Case	Control
Age	42.60 ± 5.84	43.12 ± 5.81
SBP	132.24 ± 8.69	137.92 ± 8.95
DBP	86.56 ± 4.28	90.16 ± 3.74

Table: Comparison of cases and controls with pretest and posttest SBP values by Mann-Whitney U test

*p<0.05

Time	Cases			Controls		
	Mean	SD	Mean rank	Mean	SD	Mean rank
Pretest	137.36	9.24	50.50	137.30	9.20	50.50
Posttest	132.24	8.69	41.43	137.92	8.95	59.57

Figure: Graphical representation of pretest and posttest SBP values in cases and controls by Wilcoxon matched pairs test

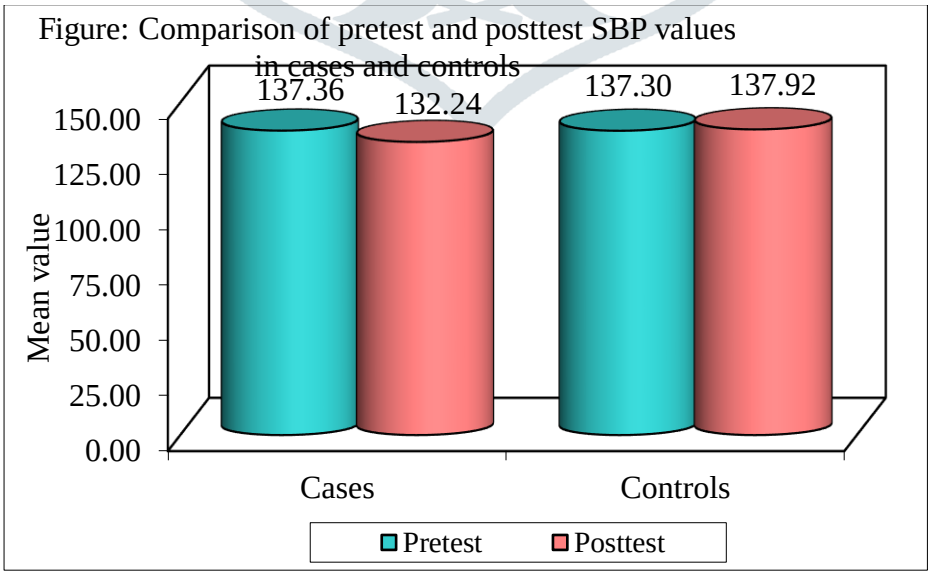
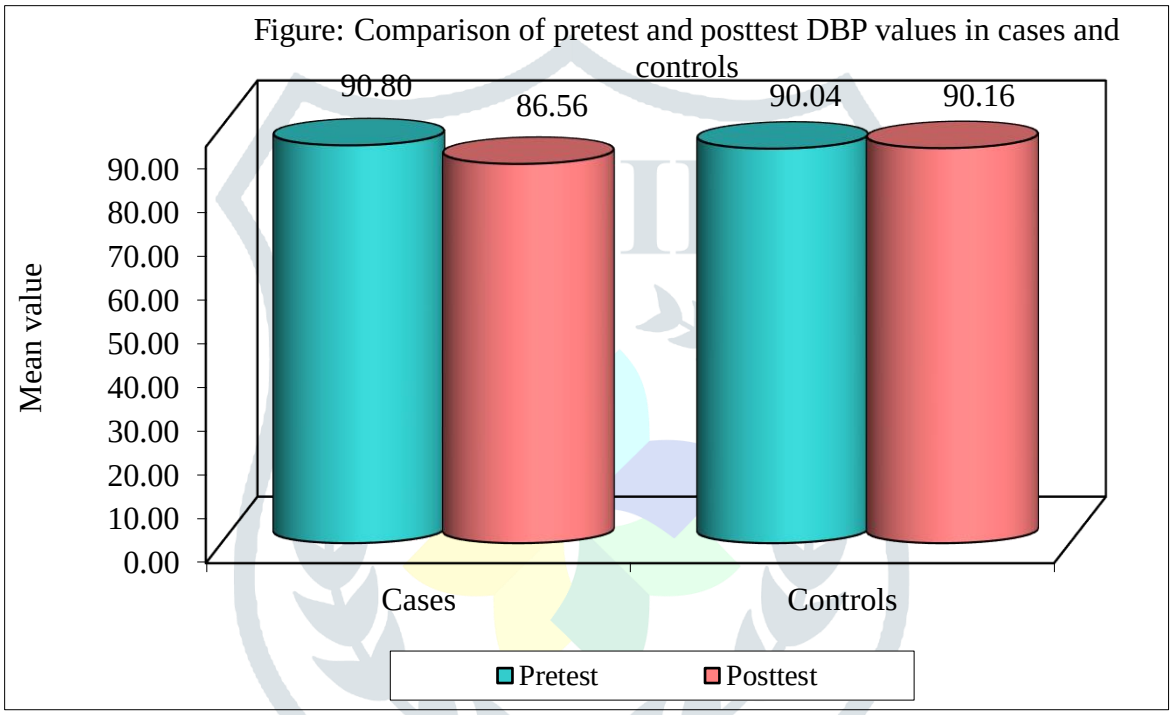


Table: Comparison of pretest and posttest DBP values in cases and controls by Wilcoxon matched pairs test

Groups	Time	Mean	SD	Mean Diff.	SD Diff.	% of effect
Cases	Pretest	90.80	4.24			
	Posttest	86.56	4.28	4.24	2.54	4.67
Controls	Pretest	90.04	3.63			
	Posttest	90.16	3.74	-0.12	2.08	-0.13

*p<0.05

Figure: Graphical representation of cases and controls with pretest and posttest DBP values by Wilcoxon matched pairs test



DISCUSSION

The present study aimed to evaluate immediate effect of neutral immersion bath with Epsom salt on blood pressure in primary hypertensive individuals. 20 subjects underwent intervention for the duration of 20 minutes,

Results of the individuals who underwent neutral immersion bath showed a significant reduction of, SBP and DBP immediately after the intervention which indicate a sympathetic withdrawal and parasympathetic dominance.

Immersion in water at 32 degrees C was shown to reduce SBP and DBP heart rate, aldosterone concentrations with diuresis, Plasma renin production and plasma cortisol. The amount of pulmonary capillary blood increases dramatically when immersed at 34 degrees C in an upright posture. Blood is moved from the periphery to the intrathoracic regions as a result of the hydrostatic counter tension. The warmth and buoyancy of

water may piece nociception by acting on warm receptors and mechanoreceptors, hence affecting spinal segmental components, in this manner diminishes the blood pressure.

When Epsom salt is broken down in warm water, magnesium particles partitioned from the salt particles as magnesium particles and sulfate particles, both of which are effectively ingested by the skin. Magnesium diminishes stretch by advancing serotonin discharge, which is capable for feelings of calmness, and by decreasing the impact of adrenaline. According to Anissimove et al, Jepps O.G et al, Magnesium may be able to bypass GI tract and enter the circulatory system via the lymphatic system underneath the dermis, boosting blood magnesium levels. Magnesium affects the activity of several enzymes in the body, as well as reducing inflammation, relaxing muscles, and preventing arterial hardening.

Expanded vascular reactivity to vasoconstrictor operators or disabled vasodilation are functional changes in hypertension that increase peripheral resistance due to changes in vascular structure and work such as arterial wall thickening, changed vascular tone, and disabled endothelial function, and reflect changes in excitation-compression coupling and or electrical properties of cells.

Increased extracellular concentration of magnesium induces vasodilation and decreases agonist-induced vasoconstriction, while its reduced concentration causes contraction and increases agonist-induced vasoconstriction. Magnesium controls tonicity of the vessels and reactivity by tweaking intracellular calcium, potassium, sodium at the intracellular level. In spite of the fact that the particular biological cause of magnesium's atomic contractile action is obscure, it is thought to affect calcium, which could be a key figure of contraction of the vascular smooth muscle. Magnesium functions intracellularly as a calcium antagonist, tweaking the vasoconstrictor activities of improved (ca2+) or extracellularly as a calcium adversary, restraining transmembrane calcium exchange and calcium entry and diminishing contractile activities of vasoactive specialists.

As the above said this could be the conceivable mechanism within the present study for the decrease of systolic and diastolic BP.

Since previous studies have showed and it is demonstrated that the magnesium in the warm water has conceivable impact in diminishing the Blood pressure, the present study use up Epsom salt might have contributed for the decrease of blood pressure.

CONCLUSION

From the results obtained, we are able to conclude that neutral immersion bath with Epsom salt on hypertensive people shows diminished sympathetic tone with the parasympathetic dominance.

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