



Immediate effect of manual acupuncture stimulation of four points versus slow breathing in declination of blood pressure in primary hypertension—A parallel randomized control trial



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ABSTRACT

Background: The WHO rates hypertension (HTN) as one of the most important causes of premature death worldwide. HTN is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India.

Objective: The study was aimed to determine the effects of manual acupuncture stimulation of a modified protocol of four points versus slow (yogic) breathing to obtain a decrease in blood pressure immediately on hypertensive subjects.

Methods: 46 subjects out of 127 were recruited for the study and divided in to two groups. Out of which 38 people successfully completed the study. The eligibility criteria were: Both sexes, age between 35 and 60 years, diagnosed with hypertension at least 3 years or less, without systemic complications and no prior experience of acupuncture. There Pre and Post Intervention Blood pressure was taken as an outcome measure.

Results: Slow breathing group showed a significant reduction in the systolic component of the blood pressure ($p < 0.007$) whereas in the acupuncture group it was unaffected. In the acupuncture group there was a significant reduction in the diastolic component ($p < 0.02$) and a little reduction in the systolic component which was not significant ($p = 0.3$). There were no significant changes in the diastolic component in the slow breathing group ($p > 0.5$).

Conclusion: The results of the present study suggests that yogic breathing practices decreases the systolic components of the blood pressure whereas the acupuncture group is effective in reducing the diastolic component of the blood pressure.

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1. Introduction

The WHO rates hypertension (HTN) as one of the most important causes of premature death worldwide [1]. HTN is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India [2]. In an analysis of worldwide data for the global burden of HTN, 20.6% of Indian men and 20.9% of Indian women were suffering from HTN in 2005 [3]. However, only about 25.6% of treated patients had their BP under control, in a multicenter study from India on awareness, treatment, and adequacy of control of HTN [4]. The drawbacks of

antihypertensive medication include side effects, such as fatigue, electrolyte imbalance, and impotence, which often result in patient intolerance [5]. The substantial cost of long term medication is also increasing an economical burden. These disadvantages suggest a need for alternative strategies in the management of hypertension. Previous research suggests HTN can be easily controlled by many non-pharmacological interventions like diet [6], yoga [7], and music therapy [8].

Acupuncture is an ancient treatment technique anchored in traditional Chinese medicine (TCM) that has been used to treat symptoms related to hypertension for centuries [9]. In 1975, acupuncture was found to significantly reduce SBP and DBP in 24 out of 28 patients with essential hypertension [10]. Acupuncture has been shown to be a safe treatment for hypertension in most studies [11].

The study was aimed to determine the effects of manual stimulation of a modified acupuncture protocol of four acupuncture

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Table 1
Description of deep breathing practices selected for primary hypertension.

Sl. no	Breathing practices	Method	Duration
1	Abdominal breathing	Taking deep breath through nose into abdomen and bulging abdomen like balloon and exhaling out very slowly and shrinking abdomen inward	20 min
2	Chest breathing	Taking deep breath to chest, expanding chest and slowly exhaling out	
3	Clavicular breathing	Taking deep breath to upper chest and observing a Clavicular movement upward with inhalation and downwards with exhalation	
4	Alternate nostril breathing	Nasika Mudra with right hand, right nostril closed by the thumb, first exhalation through left nostril and again deep inhalation through the same and exhalation through then right nostril and again inhalation through same nostril and exhalation to other, this procedure consciously repeated for some rounds	

points versus slow breathing on sudden changes in blood pressure on hypertensive subjects. We hypothesized that hypertensive subject who received manual stimulation of four selected points would show greater magnitude of decrease in blood pressure immediately following treatment than the Slow breathing group.

2. Materials & methods

The present study design was a parallel randomized group trial and was conducted at the outpatient department (OPD) of National Institute of Naturopathy (NIN), Pune, India.

2.1. Participants

The subjects were selected from the participants who took part in the one day workshop on hypertension conducted by OPD of NIN, Pune. The eligibility criteria were: Both sexes, age between 35 and 60 years, diagnosed with hypertension at least 3 years or less, without systemic complications and no prior experience of acupuncture. The patients were given an initial introduction about both acupuncture and breathing exercises after which a written informed consent were obtained.

2.2. Randomization

All the participants were randomly divided in two group, acupuncture group ($n=23$) and slow breathing group ($n=23$), by allocation concealment method using an opaque envelope.

2.3. Test environment

The testing and intervention environment was carefully controlled to reduce all kind of environmental and physical factor that may cause a fluctuation in blood pressure [13]. The temperature of the halls was delicately controlled at 23–25°C. Even to reduce the psychological factors, the physicians were also refrained from wearing aprons (White coat) as such apparel may also be able to cause a fluctuation in blood pressure [14].

Table 2
Description of acupuncture points selected for primary hypertension.

Sl. No.	Needling point	Location	Depth of needling; method
1	GV 20 (Baihui)	On the vertex of the skull, 5 cun behind the anterior hairline and 7 cun above the posterior hairline in the middle	0.5 cun; oblique needling
2	ST 36 (Zusanli)	One finger breadth lateral to the inferior border of the tibial tuberosity	1 cun; perpendicular needling
3	LV 3 (Tai Chong)	On the dorsum of the foot, in the depression proximal to the 1st metatarsal space	0.5 cun; perpendicular needling
4	HT 7 (Shenmen)	On the wrist, at the ulnar end of the transverse crease of the wrists, in the depression on the radial side of the tendon m. flexor carpi ulnaris	0.3 cun; perpendicular needling

3. Interventions

3.1. Slow breathing

Slow breathing group were provided with slow breathing practices such as abdominal breathing, slow alternate nostril breathing and sectional breathing (Table 1) in sitting position for 20 min by an institutionally qualified yoga and naturopathy physician with 4 years therapeutic yoga experience in the department of therapeutic yoga, NIN OPD. Slow breathing has been proved to reduce blood pressure by increasing the baro receptor sensitivity [12]. The participants were asked to sit comfortably in a chair at the therapeutic yoga hall. All the participants were asked to maintain silence and follow the instructions of the yoga instructor.

3.2. Acupuncture

Acupuncture group on the other hand received a single session of acupuncture based on Traditional Chinese Medicine for 20 min at one anti-hypertensive point along with three other supplement points (Table 2) seeking 'de qi' as referred in traditional text books and previous studies [15,16]. The acupuncture was given by two institutionally qualified naturopathy physicians with 3 years of experience in administering therapeutic acupuncture who otherwise has no role in the trial. Manual stimulations like flicking and rotation of the needles were given in each point except Baihui (Du 20). All the points were punctured unilaterally on the left side. One cun filiform needles manufactured locally with stainless steel of 0.38 mm diameter and 25 mm length were used for puncturing.

4. Outcome measures

Both the group underwent a general physical examination prior to the study. There Pre and Post Intervention Blood pressure was taken as an outcome measure. The auscultatory cuff blood pressure (BP) was taken using a manual calibrated sphygmomanometer (Diamond regular BP Aparatus, India). The measurement was taken in sitting position with the manometer at the heart level. The appearance and disappearance of the Korotkoff sounds were taken as systolic and diastolic blood pressure, respectively. Both pre and post blood pressure readings were taken twice by two different

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