

Original Research Article

## **Comparative Study on Immediate Effect of Unilateral Left Nostril Breathing and Unilateral Right Nostril Breathing on Blood Pressure and Heart Rate among Healthy Volunteers**

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### **ABSTRACT**

**Introduction:** In this current scenario pranayama is observed as a proven effective method for health promotion and for disease prevention. Recently many studies on long duration with Unilateral nostril breathing have proven that it have specific autonomic functions. The present study was aimed to determine immediate effects on 15 minutes practice of unilateral right nostril breathing and unilateral left nostril breathing on blood pressure and heart rate.

**Materials and Methods:** 45 healthy volunteers were selected by systematic sampling from a pool of 200 Naturopathy and Yoga medical students enrolled in a naturopathic program. Again the 45 selected healthy volunteers were randomly assigned in 3 groups, 15 each in ULNB, URNB and Control group. The participants were of both sexes aged between 18 to 25 years. Each group underwent their particular breathing technique for a period of 15 minutes except control group with normal breathing. The outcomes measured were resting blood pressure and Heart rate for all the groups.

**Results:** Statistical analysis shows that reduction of systolic blood pressure in Left UNB (t 2.779, sig 2 tailed .015) and significant reduction of heart rate in Right UNB (t 2.380, sig 2 tailed .032). Also when compare among the groups heart rate of left UNB showed significant difference when compare with Right UNB (p value = .016) and control group (p value=. 044).

**Discussion:** ULNB for 15 minutes showed that a significant reduction of systolic blood pressure and significant difference in heart rate when compare with other groups it indicates that it may potentially have a role on managing hypertension. Large randomized control trials are necessary to prove the better results.

**Keywords:** Unilateral nostril breathing, Heart rate, Blood Pressure, Pranayama, Hypertension,

### **INTRODUCTION**

Pranayama, the fourth limb of classical ashtanga yoga is an essential part of yogabhyasa and is increasingly being used as a tool of yoga chikitsa or the application of yoga as a therapy. There are a multitude of pranayama techniques and it is traditionally taught that each of them has different psycho-physiological benefits. [1] It

has been observed that health promotion effects of pranayama are mediated mainly through improvement of autonomic functions. [2] Rhythmic, deep and slow respiration stimulates and is stimulated by calm, content, states of mind. There is an intimate connection between the breath, nerve currents and control of the inner prana or vital force. [3] A previous study shows

that yoga breathing techniques which involve voluntary uninostril breathing influenced the autonomic activity based on the patent nostril rather than sex. [4] Studies have suggested that exclusive right uninostril breathing known as suryanadi pranayama or surya anuloma viloma pranayama has sympathomimetic effects including increase in metabolism, baseline oxygen consumption, systolic pressure and heart rate. [5] The present study was designed to determine immediate effects on 15 minutes practice of unilateral right nostril breathing and unilateral left nostril breathing on blood pressure and heart rate.

## METHODOLOGY

This study was conducted at the Sree Ramakrishna medical college hospital. Ethical approval has been obtained from the Institutional ethics committee. 45 Naturopathy and yoga students of the same college have been selected based on systematic sampling. The subjects were allotted to 3 groups based on simple random sampling. 15 subjects underwent Left unilateral nostril breathing, another 15 subjects underwent Right unilateral nostril breathing and other 15 are with normal breathing under control group. Both interventional group had 9 females and 6 males whereas in control group 10 females and 5 males with an age group between 17 to 20 years. Each subject was instructed to have their breakfast before 8 a.m and report for the study at 10 a.m. After getting the voluntary written consent from the subjects they are allowed to practice. The subjects were instructed to sit in any comfortable posture and relax for 2 minutes before the

pre-intervention recordings of resting Blood Pressure and Heart rate were taken.

The subjects were individually taught to perform Right UNB and left UNB by a qualified yoga instructor. An overview of the practice was given to the participants and then they were instructed to take up an erect sitting position with palms on their thighs. They were asked to keep their eyes closed to facilitate the development of inner awareness. Right unilateral nostril breathing using nasika mudra wherein the ring finger was used to occlude left nostril by pressing on the outside of the nostril with gentle pressure. The pranayama was then performed through the unblocked left nostril in a calm and regular manner for both inspiration and expiration. Subjects were instructed to breathe in and out for an equal count of 5 that was given by the instructor throughout the period in tune with a stop watch. They performed 90 rounds of Right UNB for a period of 15 minutes. Every 5 minutes of practice they had a break of 1 minute with normal breathing. A regularity of counts at the rate of 6 breaths / min was maintained by the instructor for the entire duration of 15 minutes.

Left unilateral nostril breathing using nasika mudra wherein the thumb was used to occlude right nostril by pressing on the outside of the nostril. These subjects performed 90 rounds of Left UNB as like Right UNB group. The control group was allowed to sit simply in any comfortable posture for a period of 15 minutes. Post-recordings of Heart rate and blood pressure were repeated at the end of their practice.

Statistical analysis was done by SPSS software 16.0 version

## RESULTS

Table 1: Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 presbpl - postsbpl	5.333	7.432	1.919	1.217	9.449	2.779	14	.015
Pair 2 presbpr - postsbpr	4.667	9.155	2.364	-.403	9.736	1.974	14	.068
Pair 3 predpl - postdpl	2.000	11.464	2.960	-4.349	8.349	.676	14	.510
Pair 4 predpr - postdpr	1.333	15.523	4.008	-7.263	9.929	.333	14	.744
Pair 5 prehrl - posthrl	1.333	7.556	1.951	-2.851	5.518	.683	14	.505
Pair 6 prehrr - posthrr	6.067	9.874	2.549	.599	11.535	2.380	14	.032

Results of the pre and post intervention comparisons are given in Table.1. Statistical analysis revealed that significant reduction of systolic blood pressure in Left UNB (t 2.779, sig 2 tailed .015) and significant reduction of heart rate in Right UNB (t 2.380, sig 2 tailed.032).

No statistical significant changes in diastolic BP of any group, systolic of Right UNB and heart rate of left UNB. There is no

statistical significance in systolic and diastolic BP between the groups but heart rate between the groups showed significance,  $F = 4.926$ ,  $p = .012$ . Tukeys HSD test revealed that group wise difference which is tabulated in table 2. On heart rate the left UNB showed significant difference when compare with Right UNB ( $p$  value = .016) and control group ( $p$  value = .044).

**Table: 2 Dependent Variable: Heart rate**

One way ANOVA					
Heart rate	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	366.533	2	183.267	4.926	.012
Within Groups	1562.667	42	37.206		
<b>Total</b>	<b>1929.200</b>	<b>44</b>			

	(I) Treatments	(J) Treatments	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	LUNB	RUNB	-6.467 <sup>*</sup>	2.227	.016	-11.88	-1.06
		CONTROL	-5.533 <sup>*</sup>	2.227	.044	-10.94	-.12

\*. The mean difference is significant at the 0.05 level. LUNB-Left Unilateral Nostril Breathing RUNB-Right Unilateral Nostril Breathing

## DISCUSSION

The immediate decrease in systolic blood pressure of left UNB in our study is well correlated with the earlier study 30 min practice of Left nostril yoga breathing. [6] A study explained that in men both the right and left unilateral forced nostril breathing significantly increased systolic blood pressure and heart rate but had no effect on diastolic blood pressure, in contrast for women right unilateral forced nostril breathing increased but the left unilateral forced nostril breathing slightly decrease the systolic blood pressure was well correlated with our study. [7] There is a significant reduction of heart rate after URNB was not correlated with previous study. [8] Changes in the autonomic balance as it has been previously reported that sympathetic activity is lower during left nostril breathing was close with our study. [9] When compare the 3 groups ULNB shows significant reduction of heart rate against the URNB and Control group. Findings of this study indicate that alterations in autonomic functions following unilateral nostril breathing. 15 min practice of LUNB reduces systolic pressure and

RUNB reduces heart rate. These effects suggest possible therapeutic application.

## CONCLUSION

Unilateral left nostril breathing, a technique of pranayama has been performed in this study have a significant effect in immediate reduction of systolic blood pressure among normotensive patients. Also unilateral right nostril breathing has been performed in this study to have significant reduction of heart rate among healthy volunteers. Large scale randomized control trial among hypertensive patient is necessary to prove the better results.

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