

# ***Immediate Effect of Slow Pace Unilateral Left Nostril Breathing with Internal Breath Retention on Blood pressure And Pulse Rate among Normal Healthy Adults***

R. Jain Raj<sup>1</sup>, R. Anusha<sup>2</sup>, Jyothi Naveen<sup>2</sup>

<sup>1</sup> Department of Community Medicine, Sree Ramakrishna Medical College of Naturopathy and yogic sciences, Kulasekharam Kanyakumari District, Tamilnadu, India.

<sup>2</sup> Department of Yoga Therapy, Sree Ramakrishna Medical College of Naturopathy and yogic sciences, Kulasekharam Kanyakumari District, Tamilnadu, India.

## **Abstract:**

**Introduction:** Pranayama is one among the most important yoga practice which regulates or control prana; the vital force there by brings a harmony between body and mind and thus maintains a healthy living. Pranayama has proved to have beneficial effects upon blood pressure and pulse rate. The present study was aimed to determine the immediate effects of 10 minute practice of slow pace unilateral left nostril breathing with internal breath retention on blood pressure and pulse rate on normal healthy adults.

**Methodology:** 30 healthy subjects of 20-22 years age group of both sexes were selected randomly from Sree ramakrishna Medical College of Naturopathy and Yogic sciences from a pool of 420 students. The subjects were asked to practice unilateral left nostril breathing with internal breath retention for 10 minutes. Blood pressure and pulse rate is measured before and after pranayama.

**Results:** Statistical analysis shows reduction of systolic blood pressure (t 6.898, sig 2 tailed .000) and diastolic blood pressure (t 3.516, sig 2 tailed .001) and also a significant rise of pulse rate (t -10.463, sig 2 tailed .000)

**Discussion:** 10 minutes practice of unilateral left nostril breathing with internal breath retention showed a significant reduction of systolic and diastolic blood pressure with increase of pulse rate. It indicates that it may have an important role to play in hypertensive patients. Large randomized control trials are necessary to prove the better results.

**Keywords:** Unilateral left nostril breathing (ULLNB), Chandra anuloma viloma pranayama, blood pressure (BP), pulse rate (PR), internal breath retention (IBR), antar kumbaka.

**Asian Journal of Complementary and Alterantive Medicine.**

**Volume 05, Issue 16**

**Published on:** 20/08/2017.

**Author For Correspondence:** Dr. R. Jain Raj, 2/44, Bethel Illam, Kappuvilai, Verkilambi post, Pincode-629166, Kanyakumari District, Tamilnadu, India. Ph: 820405193, Email id: [jainrajrusel@gmail.com](mailto:jainrajrusel@gmail.com)

**Cite this article as:** R. Jain Raj, R. Anusha, Jyothi Naveen. *Immediate Effect of Slow Pace Unilateral Left Nostril Breathing with Internal Breath Retention on Blood pressure And Pulse Rate among Normal Healthy Adults*. Asian Journal of Complementary and Alterantive Medicine, Vol 5(16):7-10, 2017.

## **INTRODUCTION**

Yoga is reported to be beneficial in treating stress related disorders, improving autonomic functions, lowers blood pressure, improve sense of well being, control breathing, reduces oxidative stress and improving spiritual growth.<sup>[1]</sup> Pranayama is gaining popularity day by day as it involves manipulation of breath and is a dynamic bridge between body and mind which is beneficial when practiced in both slow and fast manner.<sup>[2]</sup> Also regular practice of pranayama produce different physiological cardiovascular responses in healthy subjects.<sup>[3][4]</sup> Patanjali in his text of sutras mentioned pranayama as the means of attaining higher states of awareness, he mentions the holding of breath

as important practice of reaching Samadhi. Hatha yoga also talks about pranayama which will make the body and mind healthy. Actual pranayama means the holding up of the process of exhaling and inhaling.<sup>[5]</sup> Chandra anuloma viloma is one among the pranayama which posses beneficial effects upon cardiovascular parameters<sup>[6]</sup> and it reduces sympathetic activity.<sup>[7]</sup> The present study was designed to determine the immediate effects on 10 minutes practice of slow pace unilateral left nostril breathing with internal breath retention for individuals with stable cardiac function.

## **METHODOLOGY**

This study was conducted at Sree Ramakrishna medical college hospital for naturopathy and yoga,



kulasekharam. Ethical approval for conducting this study was got from Institutional ethical committee (Approval no: 7-2/SRKMCNYS/IMR/IEC 18). Out of total 420 students who pursue their degree in this college 30 naturopathy and yoga students have been selected based on simple random sampling. Each subject was instructed to report for the study at 4:00 pm at hospital yoga hall. The subjects were individually taught to perform unilateral left nostril breathing with internal breath retention by a qualified yoga instructor. After getting consent from the students, they are allowed to practice unilateral left nostril breathing with internal breath retention.

The subjects are asked to relax for five minutes immediately after their arrival. Then their blood pressure and pulse rate is measured as pre test values. After that the samples are subjected to sit in dandasana (specific relaxation yoga pose in sitting series) with eyes closed and asked to relax. They underwent normal breath for a period of 2 minutes. Then they were asked to sit in sukhasana (easy pose) and instructed to adopt chin mudra on left hand and nasikagra mudra on right. Then they started practicing inhalation for 4 seconds through left nostril simultaneously closed the right nostril using thumb. Then they withheld the breath internally for 4 seconds by closing both nostril using thumb for right and ring finger for left and then they exhaled through left nostril for a rate of 4 seconds i.e. inhalation, internal retention and exhalation at the ratio of 1:1:1.(each for 4 seconds) to complete one cycle. This is practiced continuously for 50 cycles for a period of 10 minutes. After that they were asked to relax in dandasana for one minute and immediately after post test values were measured for blood pressure and pulse rate. For measuring blood pressure standard tool of sphygmomanometer diamond regular IS 3390 and

stethoscope micro-tone had used, for pulse rate we measured through manual method.

**BIOLOGICAL EVIDENCE**

ULLNB induces a generalized decrease in the excitatory pathways regulating respiratory and cardiovascular systems. As respiratory and cardiovascular system have similar control mechanisms, alteration in one system will modify the functioning of the other. [8] During slow pace practice of pranayama, lung inflates to the maximum and this stimulates pulmonary stretch receptors which bring about withdrawal of sympathetic tone in skeletal muscles and blood vessels leads to widespread vasodilatation and decrease in peripheral resistance and thus decrease diastolic blood pressure. While practicing pranayama, the concentration will be on the act of breathing which removes attention from all worries and distress them. This stress- free state of mind evokes relaxed responses in which parasympathetic activity overrides sympathetic activity. It also reduces stress induced sympathetic over activity thereby decreasing arterial tone and peripheral resistance resulting in lowering of diastolic blood pressure. [9]

**RESULTS:**

The data was analyzed using SPSS software version 16.0. We applied Paired t-test to find the mean difference between pre and post measurements of blood pressure and pulse rate. Results of pre and post measurement comparisons are given in table 1 and 2. The mean difference between pre and post pulse rate was plotted on figure1. It was revealed that after practicing 10 minutes of ULLNB with internal breath retention reduced the systolic blood pressure (t 6.898, sig 2 tailed .000) to 6.69% and diastolic blood pressure had reduced (t 3.516, sig 2 tailed .001) to 4.07%. But the pulse rate got elevated (t -10.463, sig 2 tailed .000) to 15.31% after practice of ULLNB with internal breath retention for a period 10 minutes.

Sl.no	Variables	Mean	Number	Std deviation	Std mean error
pair 1	Presystole	110.47	30	13.449	2.455
	Postsystole	103.07	30	14.429	2.634
pair 2	Prediastole	75.13	30	10.500	1.917
	Postdiastole	72.07	30	9.748	1.780
pair 3	PrePR	73.13	30	8.199	1.497
	PostPR	84.33	30	9.098	1.661

Table 1: Descriptive statistics

Sl.no	Paired difference					t	df	Sig.(2- tailed)
	Mean	Std. Deviation	Std. Error mean	95% of Confidence Interval of the difference				
				Lower	Upper			
Pair-1 presys- post sys	7.400	5.876	1.07	5.206	9.594	6.898	29	.000
Pair-2 Predia-postdia	3.067	4.777	.872	1.283	4.851	3.516	29	.001
Pair-3 prePR-postPR	-11.200	5.863	1.070	-13.389	-9.011	-10.463	29	.000

**Table 2: Paired samples test**

\*The mean difference is significant at the 0.05 level.

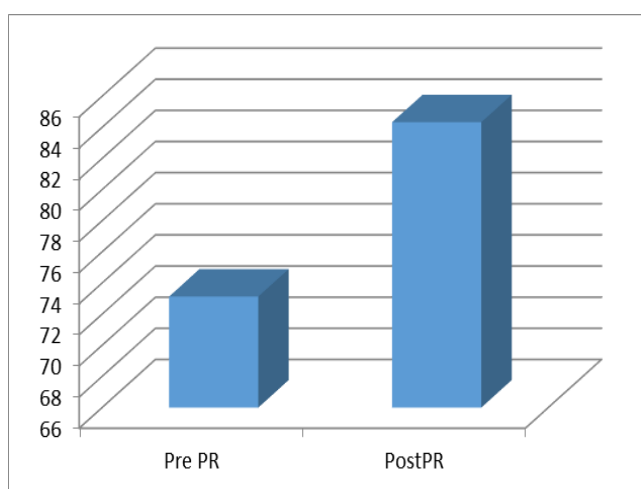


Figure: 1 Mean difference of Pre & Post Pulse Rate

This study clearly shows that practicing ULLNB with internal breath retention for a period of 10 minutes significantly reducing the blood pressure. The participants evidenced significant reductions in their systolic as well as diastolic BP and statistical significant rise in pulse rate.

**DISCUSSION**

Many studies proved that practice of ULLNB on long duration have specific autonomic functions.<sup>[10]</sup> Significant decrease in systolic and diastolic blood pressure after yoga practice in present study is in accordance with the findings of other studies on physiological effects of yoga in healthy individuals.<sup>[11]</sup> The immediate decrease in blood pressure is explained by changes in the autonomic balance as it has been previously reported that sympathetic activity is lower during left nostril breathing.<sup>[12][13]</sup> 10 minutes practice of ULLNB immediately reduces systolic as well as diastolic pressures suggest its possible therapeutic application.

The present study also marks a significant rise in pulse rate which is well correlated with the previous study.<sup>[3]</sup>

**CONCLUSION**

ULLNB with internal breath retention performed in this study showed a significant reduction of blood pressure and rise in pulse rate among normal healthy adults. It is concluded that ULLNB with internal breath retention is effective in reducing systolic and diastolic blood pressures. To the best of our knowledge there is no previous study on immediate effect of ULLNB with internal breath retention and which may have beneficial clinical effect. This pranayama practice when utilized in daily life can bring an immediate reduction of blood pressure. This study needs further clinical trials with large samples to show the effect of ULLNB with internal breath retention on blood pressure among hypertensive patients.

**REFERENCES**

1. Krishna bihari verma, Seema, Subarna ghosh, Chandana bera. Effect of pranayama on bloodpressure and heartrate in hyperreactor to cold pressor test. J of Evolution of Med and Dent Sci/ eISSN- 2278-4802, pISSN- 2278-4748/ Vol. 3/ Issue 30/July 28, 2014.
2. Madanmohan, Udupa.K, Bhavanani AB, Vijayalekshmi, Surendran A. effect of slow and fast pranayamas on reaction time and cardiorespiratory variables. Indian Jphusiol pharmacol.2005;49:313-8(pubmed)
3. Telles, Reghuraj P,Arankelle D,Naveen KV. Immediate effect of high frequency yoga breathing on attention. India J Med Sci-2008;62:20-2(pubmed)
4. UdupaK,Madanmohan,BhavananiAB,Vijayalekshmi P,Krishnamoorthy N. Effect of pranayama on cardiac function in normal young volunteers. Indian physiol pharmacol 2003-97:27-33(pubmed)
5. www.yogapoint.com, pranayama- from hatayoga and ashtangayoga [Accessed on July 11;2017 at 11:45am]
6. Roopa B,Ankad, Amita Herur, Surekharani Chinagudi. The effect of short term pranayama and meditation on

- cardiovascular functions in healthy individuals. *Heart Views*. 2011 Apr-Jun; 12(2): 58–62. doi: 10.4103/1995-705X.86016
7. Telles , Nagarathna, Nagendra HR. Effect of breathing through a particular nostril can alter metabolism and autonomic activities. *Indian physiol J Pharmacol*1994;38: 133-7.
  8. Raghuraj P, Ramakrishnan AG, Nagendra HR, Telles S. Effect of two selected yogic breathing on heart rate variability. *Indian J Physiol pharmacol*.1998;42:467-72.[pubmed]
  9. Bharshankar JR, Bharshankar RN, Deshpande VN, Kaore SB, Gosavi GB. Effect of yoga on cardiovascular system in subjects above 40 years. *Indian physiol J Pharmacol*.2003;47:202-6[pubmed]
  10. Jain raj, Anusha R, Asbin Birle. Comparative study on immediate effect of unilateral left nostril breathing and unilateral right nostril breathing on bloodpressure and heart rate among healthy volunteers. *International journal of health sciences and research*. ISSN: 2249-9571, Vol.6; Issue: 10; 35-238,October 2016,
  11. Joseph CN, Casucci G, Casiraghi N, Maffies M, Rossi M, et al. slow breathing improves arterial baroreflex sensitivity and decreases bloodpressure in essential hypertension.2005;46:714-8.[pubmed]
  12. Mohan SM, Svava (nostril dominance) and bilateral volar GSR. *Indian J physiol pharmacol* 1996;40:58-64(pubmed).
  13. Ananda balayogi bhavanani, Madanmohan, and Zeena Sanjay. Immediate effect of Chandra nadi pranayama (left unilateral forced nostril breathing) on cardiovascular parameters in hypertensive patients. *International journal of Yoga*, 2012, vol: 5, Issue: 2, 108-111.