



Research Article

ROLE OF NADI SHUDDHI PRANAYAMA ON HYPERTENSION**Anjali Sharma¹, Vishal Khanna^{2*}, Ankush Bhardwaj³, Abineet Raina⁴**¹Assistant Professor, Department of Kriya sharir, Sri Ganganagar College of Avurvedic Science & Hospital, Rajasthan.²Associate Professor, Dept. of Shalya Tantra, Jammu Institute of Ayurveda and Research, Nardani, Bantalab, Jammu.³Assistant Professor, Dept. of Shalakyta Tantra, Jammu Institute of Ayurveda and Research, Nardani, Bantalab, Jammu.⁴Assistant Professor, Dept. of Shalya Tantra, Saint Sahara Ayurved Medical College & Hospital, Kotshamir, Bathinda.**KEYWORDS:** *Nadi Shuddhi pranayama*, HPA axis, SNS, hypertension.**ABSTRACT**

Yoga is the science of human being in depth, the science of conscious evolution or the science of human possibilities. It is a unique science that it encompasses matter, life and consciousness in one sweep and bridges the gap between science and spiritually. Thus *Yoga* may be considered as a system of mental, physical and spiritual developments. The *Pranayama* (*Prana*-breath *ayam*-pause) is one of the eight steps of yogic practice and is concerned with controlled breathing exercises and in broader sense, the control of vital force *Prana*. Basically *Pranayama* consists of 3 phases namely *Puraka* (inhalation), *Kumbhaka* (pause), *Recaka* (exhalation). The best proportion of time to be allotted to these three steps is 1:4:2 respectively for inhaling, controlling, and exhaling the breath. There are numerous studies which have shown that *yoga*, especially *Pranayama*, have an immediate down regulating effect on both the hypothalamic- pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS) response to stress. Studies show that *Pranayama yoga* decreases levels of salivary cortisol, blood glucose, as well as plasma rennin levels, and 24-hour urine norepinephrine and epinephrine levels. *Pranayama* significantly decreases heart rate and systolic and diastolic blood pressure. So with this idea, this study has been carried out on a total of 100 patients having signs and symptoms of stage I and stage II hypertension and *Nadi shuddhi pranayama* was practiced daily for a period of one month by these patients. Patients were assessed on parameters such as Blood pressure, Headache, Palpitation, Dizziness, Nervousness, Fatigue, Insomnia and Breathlessness. The Significant relief was observed in Blood pressure and sign and symptoms after treatment and it was concluded that *Nadi Shuddhi pranayama* produces a significant fall in blood pressure level and other sign and symptoms in hypertensive patients.

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INTRODUCTION

Ayurveda and *Yoga* are the ancient disciplines designed to bring balance and health to the physical, mental, emotional, and spiritual dimensions of the individual. *Yoga* is often depicted metaphorically as a tree and comprises eight aspects i.e. *Yama* (universal ethics), *Niyama* (individual ethics), *Asana* (physical postures), *Pranayama* (breath control), *Pratyahara* (control of the senses), *Dharana* (concentration), *Dhyana* (meditation), and *Samadhi* (bliss). A growing body of research evidence supports the belief that certain Yogic techniques may improve physical and mental health through down-regulation of the hypothalamic pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS). The HPA axis and SNS are triggered as a response to a physical or psychological demand (stressor), leading to a cascade of physiological, behavioral, and psychological effects, primarily as a result of the release of cortisol and catecholamines (epinephrine and norepinephrine). This response leads to the mobilization of

energy needed to combat the stress through the classic "fight or flight" syndrome. Over time, the constant state of hypervigilance resulting from repeated firing of the HPA axis and SNS can lead to deregulation of the system and ultimately diseases such as obesity, diabetes, autoimmune disorders, depression, substance abuse, and cardiovascular disease.

There are numerous studies which have shown that *yoga*, especially *Pranayama*, have an immediate down regulating effect on both the SNS/HPA axis response to stress. Studies show that *Pranayama yoga* decreases levels of salivary cortisol, blood glucose, as well as plasma rennin levels, and 24-hour urine norepinephrine and epinephrine levels. *Pranayama* significantly decreases heart rate and systolic and diastolic blood pressure. *Pranayama* reverses the negative impact of stress on the immune system by increasing levels of immunoglobulin A as well as natural killer cells. *Pranayama* has been found to decrease

markers of inflammation such as high sensitivity C-reactive protein as well as inflammatory cytokines such as interleukin-6 and lymphocyte-1B. So with this idea, an attempt has been made through this project to study the effect of *Nadi Shuddhi Pranayama* on hypertension to evaluate the lacuna i.e. to find out the possibilities related and associated with this topic for a safe and effective management by following the *Dincharya* and the *Ritucharya* in the light of modern science.

Pranayama for Nadi Suddhi

The *Vayu* cannot enter the *Nadis* if they are full of impurities. Therefore, first of all, they should be purified and then *Pranayama* should be practised. The *Nadis* are purified by two processes, viz., *Samanu* and *Nirmanu*. The *Samanu* is done by a mental process with *Bija Mantra*. The *Nirmanu* is done by physical cleansing or the *Shatkarmas*. It is mentioned in yogic texts that there are about 7.2 million *Nadis* or nerve passages in human body. *Nadi shuddhi pranayama* is advised for the purification of these nerve passages.

Procedure of Nadi Shuddhi Pranayama

1. Sit in *Padmasana*
2. Keep the right thumb, middle and ring fingers gently over the right and left nostrils respectively.
3. Press and close the left nostril gently with the middle and ring fingers and breath-in slowly through the right nostril for a period of ten counts duration.
4. Press and close the right nostril gently with the right thumb, release the left nostril and breathe-out through the left nostril for the same duration.
5. Now breathe-in through the left nostril for the same duration, in the same manner.
6. Press and close left nostril gently and breathe out through the right nostril for the same duration.
7. One round is now completed. Repeat this procedure for ten rounds.

Materials and Methods

A total of 100 patients were selected randomly from OPD and IPD of Jammu Institute of Ayurveda and Research hospital, Jammu. All the patients were clinically diagnosed cases of hypertension and were registered properly.

Results

Table 1: Effect on Symptoms of Hypertension after Pranayama

Symptoms	No. of patients Before Pranayama	No. of patients After Pranayama	Percentage improvement
Headache	48	29	39.58%
Palpitation	23	16	30.43%
Dizziness	26	8	69.23%
Nervousness	20	8	60.0%
Fatigue	46	28	39.13%
Breathlessness	53	33	37.73%
Insomnia	61	24	60.65%

Inclusion criteria

- Patients with age of 30-70 yrs.
- Patients of both sexes
- Patients of stage I and stage II hypertension.

Exclusion criteria

- Patients with malignant and secondary hypertension.
- Patients with the history of MI, unstable angina, arrhythmias, CCF, stroke, uncontrolled endocrine or metabolic diseases, hepatic failure, impaired renal function, severe diabetes mellitus, tuberculosis, malignancy, patients who are operated for any reason.
- Pregnant women.

Duration of Treatment : One month.

The Assessment on the Basis of Cardinal Sign

Cardinal sign is persistent elevated blood pressure. The alteration in the systolic and diastolic blood pressure, before and after treatment is duly recorded.

The Assessment Gradation on the Basis of Sign and Symptoms

The suitable scoring method for signs and symptoms i.e. Headache, Palpitation, Dizziness, Nervousness, Fatigue, Insomnia and Breathlessness were recorded in the following fashion:

- Not present / Absence of symptoms 0
- Mild symptoms 1
- Moderate symptoms 2
- Severe symptoms 3

Diet

Patients of both the groups were advised to take salt restricted diet.

Follow up Study

After completion of treatment, all the patients were advised to report in the O.P.D. at the regular interval of one week for at least two weeks for the follow up study. Their blood pressure was recorded after 15 minutes rest. The condition of other sign and symptoms was also noted.

Table 2: Effect on Blood Pressure After *Pranayama* 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	Systolic_BT - Systolic_AT	1.174000	6.70688	.67069	10.40921	13.07079	17.504	99	.000

Table 3: BP Diastolic- BT & AT 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	Diastolic_BT Diastolic_AT	6.49000	3.93507	.39351	5.70920	7.27080	16.493	99	.000

DISCUSSION

Discussion of the results showed that *Nadi shuddhi pranayama* provided a significant relief in cardinal sign and symptoms of hypertension. *Nadi Shuddhi pranayama* techniques improve physical and mental health through down-regulation of the hypothalamic- pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS). The HPA axis and SNS are triggered as a response to a physical or psychological demand (stressor), leading to a cascade of physiologic, behavioral, and psychological effects where as yoga exercises like *Nadi Shuddhi pranayama* cause a shift toward parasympathetic nervous system dominance, possibly via direct vagal stimulation. The HPA axis and SNS are triggered as a response to a physical or psychological demand (stressor), leading to a cascade of physiologic, behavioral, and psychological effects, primarily as a result of the release of

1. Cortisol
2. Catecholamines (epinephrine and norepinephrine).

This response leads to the mobilization of energy

needed to combat the stressor through the classic “fight or flight” syndrome.

3. Rennin- angiotensin-aldosterone
4. Vasopressin (ADH)

Over time, the constant state of hypervigilance resulting from repeated firing of the HPA axis and SNS can lead to deregulation of the system and ultimately diseases such as obesity, diabetes, autoimmune disorders, depression, substance abuse, and cardiovascular disease. It has been hypothesized that some yoga exercises cause a shift toward parasympathetic nervous system dominance, possibly via direct vagal stimulation. *Nadi Shuddhi pranayama* easily achieves voluntary control over autonomic nervous system and relieves stress. *Nadi Shuddhi pranayama* practices have been found very useful in resolving emotional conflicts and neurotic tendencies. There is not a single modern medicine available as such which could do all this so safely as *Nadi Shuddhi pranayama*.

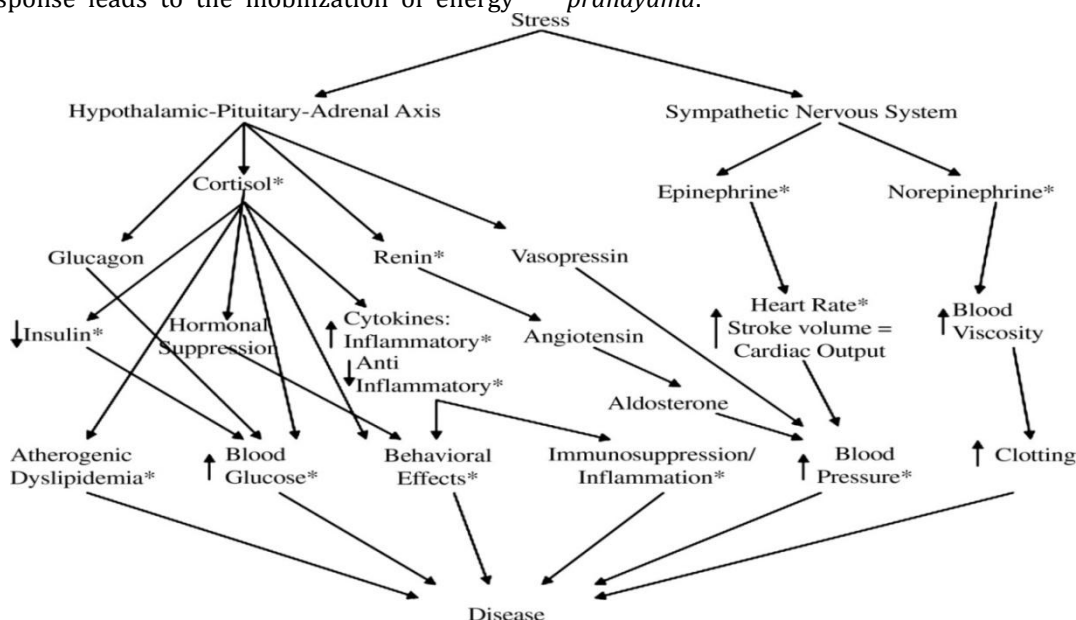


Figure 1: Impact of stress on HPA axis and SNS

CONCLUSION

Nadi Shuddhi pranayama produces a significant fall in blood pressure level of hypertensive patients of all the *Prakriti* and has definite role in prevention and management of hypertension. Pre hypertensives and stage-I form of uncomplicated hypertension can be managed alone by *Pranayama* and other life style modifications. In complicated cases and stage-II hypertension, *Pranayama* should be used with anti-hypertensive drugs.

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