



ROLE OF BHARAMARI PRANAYAM IN MANAGEMENT OF HYPERTENSION

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ABSTRACT

Essential hypertension is a rise in blood pressure and in 90% it is of unknown cause. Secondary hypertension which is the result of a pathology, chronic kidney disease, narrowing of the aorta or endocrine disorder. The predisposing factors may be single or multiple are genetic, environmental, behavioural including work stress and food habits. The first 6 lines of yog sutra control body mind and soul. *atha yoga-anusasanam, yogas-chitta-vrattinirodhah, tadadrashtuhsvarupe-vasthanam,*

BHRAMARI – HUMMING-SHABAD is a phonatory respiratory exercise releases nitric oxide. Bhamari increases the production of nitric oxide by 16 times. Nitric oxide is omnipresent a pleiotropic signalling molecule, plays important role in almost every biological system and controls hypertension

Material And Method

We randomly selected 82 patients of essential hypertension from the outdoor of hospital, out of which 40 were of uncontrolled hypertension. Detailed case history, family history, duration of illness, drug type, regularity and diet pattern were questioned and recorded. Blood Pressure (BP), pulse rate (PR), Oxygen saturation (Spo₂) were monitored before and after meditation.

Results

The most common aggravating factor was sedentary life style (90%) followed by work stress (30%) commonest warning symptom was tiredness. There was reduction of 18mm systolic and 12mm Hg in diastolic blood pressure.

Conclusion

Bhamari Pranayama, focused concentration (Shiv Dhyana) and slow deep abdominal breathing with extended exhalation leads to calmness reduces hyperactive sympathetic activity and enhances parasympathetic activity. The average lowering of blood pressure was observed by 18/12mm of Hg. and pulse by 8/minutes. Regularising the life style, avoiding excess salt, processed food, adding potassium and chlorophyll enhanced diet with timely 8 hours sleep may further reduce the overall prevalence of hypertension and prevent associated, cardiac and other complications.

KEYWORDS : Hypertension, Bhamari Pranayam, Deep Abdominal Breathing, Shanmukhi Mudra, Yogic Breathing, Vit. D Deficiency

Essential hypertension is a rise in blood pressure and in 90% it is of unknown cause. Secondary hypertension which is the result of a pathology, chronic kidney disease, narrowing of the aorta or endocrine disorder¹. We ingest and excrete about 1.0gm of sodium that is 2.5 gm of table salt per day. The essential hypertension develops when the kidney can not excrete this sodium which is due to sympathetic nervous system dysfunction. The predisposing factors may be single or multiple are genetic, environmental, behavioural including work stress and food habits. Body homeostasis wants to compensate and balance it. When body defence fails hypertension is the result. There are multiple researches confirming high intake of salt results in hypertension. Obesity, diabetes, ageing, sedentary life style and low Potassium intake are the aggravating factors. 57% of deaths are due to uncontrolled hypertension leading to stroke² and 24% deaths due to coronary heart disease because heart has to make an extra effort continuously. This also leads to thickening of blood vessels known as atherosclerosis. It is important to diagnose and manage hypertension. Stress induced hypertension responds poorly to medical management.

Physiology Of Hypertension Genetics- ten genes are there which can predispose to essential hypertension but aggravating factors are necessary to precipitate the disease³.

Autonomic nervous system- It plays a key role in maintaining cardiovascular homeostasis via pressure, volume, and chemoreceptor signals. Excess activity of the sympathetic nervous system increases blood pressure by alterations in the baroreflex and chemoreflex pathways at both peripheral and central level.

Exposure to stress increases sympathetic outflow, and repeated stress-induced vasoconstriction may result in vascular hypertrophy, atherosclerosis leading to progressive increase in peripheral resistance and blood pressure.

Renin-Angiotensin-Aldosterone System

Maintains the extracellular fluid volume, peripheral resistance, and disturbance lead to hypertension. Being a potent constrictor of all blood vessels it acts on the musculature of arteries, raising peripheral resistance and thereby elevating blood pressure. Angiotensin II also causes the adrenal glands to release aldosterone, which stimulates the epithelial cells of the kidneys to increase re-absorption of salt and water, leading to raised blood volume and raised blood pressure. Renin angiotensin system of adipose tissue in obesity is a risk factor for hypertension and is also a factor for insulin resistance.

Endothelial Dysfunction

The endothelium of blood vessels produces an extensive range of substances that influence blood flow and, in turn, is affected by changes in the blood and the pressure of blood flow. For example, local nitric oxide and endothelin⁴ Potassium deficit has a critical role in hypertension. This imbalance leads to contraction of vascular smooth muscle, restricting blood flow and so driving up blood pressure. Potassium supplementation has been effective in reducing hypertension⁵. Deficiency of Vitamin D affects kidney function & predisposes to poor homeostasis, deafness and hypertension⁶.

Patients of essential hypertension respond nicely to yoga meditation, healthy life style, consuming balance vegan diet and scheduling of the day. Subconscious stress is the key etiological factor of hypertension though not realized by majority. We must know and observe the warning signs of stress, are Headache, body ache, Tiredness, exhaustion /Trembling/shaking/Grinding teeth, clenched jaw, Cold and sweaty palms, stiffness in neck, face or shoulders, sleep problems, tachycardia Indigestion or acid reflux /Increase or loss of appetite, Weight gain/loss, Sexual difficulties.

It is the most unfortunate that majority thinks asana as the

main component of yoga while Patanjali Yoga Sutra emphasises in the first chapter in the first 6 lines how to control body mind and soul.

अथयोगानुशासनम्॥१॥

atha yoga-anusasanam॥1॥अथयोगानुशासनम्॥So Yoga is: an introduction to the study and practice discipline |1| योगश्चित्तवृत्तिनिरोधः॥yogas-chitta-vratti-nirodhah ॥When you are in a state of yoga, all misconceptions (vrittis) that can exist in the mutable aspect of human beings (chitta) disappear. |2| तदाद्रष्टुःस्वरूपेजस्रस्थानम्॥tadadrastuhsvarupe-'vasthanam॥For finding our true self (drashtu) entails insight into our own nature. |3|

by following these you go into alpha brain wave state –a state of healing

It is a simple technique which can be easily picked up and practiced by majority in five hours training.

Change Genetic Destiny

Lets learn-- OPTIMIZE the feel good hormones level by diet/environment, Bhramari Pranayam, focused concentration by generating Alpha, Theta and Delta Brain Waves.We have to analyse and understand the science how above practises lower the blood pressure, control the body, provide over all good health and it can lead to total transformation or kayakalp. We have to review the vagus nerve, its function vagal tone, effect of breathing and bhramari pranayama on hypertension and homeostasis.

The vagus nerves are the key conduit for efferent parasympathetic nerve activity,delivering almost all internal organs specifically to cardiovascular, respiratory, gastrointestinal, and immune systems. It affects heart rate (HR), cardiac conduction, and smooth muscle tone hence it is anti-arrhythmic anti-hypertensive and anti-inflammatory. Vagus nerve can be stimulated by Valsalva maenuvre-jalandhar bandha, gag reflex-khechri mudra, Arnold nerve-shanmukhi mudra, pineal gland-ajna chakra through hypothalamus and by alkaline food (gastric reflex).

Vagal Tone:- Enhanced vagal tone activates the parasympathetic nervous system. It is measured by the heart rate during breathing.Heart rate increases when we breathe in and slows down when we breathe out, bigger is the difference of inhalation- exhalation heart-rate, higher is the vagal tone. More than ten is treated as good vagal tone Higher vagal tone that is predominance of parasympathetic activity means-relaxation-alpha brain wave state of mind. It improves blood sugar regulation, reduces risk of stroke & cardiovascular diseases, lowers B P, inhibits cytokine production hence improves digestion - better production of digestive enzymes and healing. Lower vagal tone that is predominance of sympathetic activity leads to retention of sodium in body, cardiovascular disorders, strokes, depression, diabetes, chronic fatigue syndrome, cognitive impairment, predisposes-inflammatory conditions-autoimmune diseases, rheumatoid arthritis, inflammatory bowel disease, endometriosis, autoimmune thyroid conditions, lupus hence we should learn and practice slow, deep, rhythmic, diaphragmatic or abdominal breathing.

Breathing Patterns And its Affects

- | | |
|-------------------------|-----------------|
| • STRESS BREATHING | YOGIC BREATHING |
| • Rapid shallow | deep abdominal |
| • Free radicals | anti oxidants |
| • 2 units ATP | 38 unit ATP |
| • VATA –OSTEO CLASTIC | APOPTOSIS |
| • DEFORMITY OF TELEMERE | REPAIR |
| • Mutation-cancer | Healing |

Bhramari – Humming-shabad⁷

It is a phonatory respiratory exercise releases nitric oxide. Bhramari increases the production of nitric oxide by 16 times. It is a gas molecule, key biological messenger playing an important role in biological processes at cellular level.

Nitric oxide is omnipresent a pleiotropic signalling molecule,plays important role in almost every biological system,potent vasodilator / key regulator in vascular homeostasis controls blood pressure.

Nitric Oxide enhances neural transmission / memory / apoptosis / reproduction / lipolysis / regulation of energy balance / host defence.It regulates hormone releases in hypothalamic - pituitary axis/inhibits prolactin secretion / catecholamine release / steroid genesis in adrenal gland / regulate insulin / carbohydrate metabolism. It has a role in thyrocyte / thyroid function. Nitric oxide released by Bhramari Pranayam - accelerates the microcirculation of blood and by virtue of vibration, decloggs the tiny blood vessels of brain and the body⁸.

Brain Wave And Health

As we age feel good hormones are released in smaller amounts including production of growth stimulating hormones hence body repair is poor and body is susceptible to deterioration/disease. Alpha theta and delta waves increase the production of all health-boosting hormones, neuropeptides, and neurotransmitters, specifically increases production of Hormones melatonin and DHEA.Production of "stress hormone" cortisol is lowered in slower brainwave bands.

Melatonin :- microbiological structure of pineal gland resembles the structure of retina and is sensitive to light (darkness) is influenced by biological clock and is dependent on light (Divya Jyoti – Ajna Chakra).

Melatonin release can be enhanced by food supplement Banana/sweet Corn/Ginger/barley/tomatoes/redwine

Serotonin

- Mood stabilizer related to the evolution .It increases the intelligence power. Amino acid tryptophan consumption increases the synthesis Gut micro biota, probiotics, pickles, apple cider vinegar, kanji and fermented food can provide up to 70% body need from intestine. Exercise, meditation, positive attitude, focused concentration increases it synthesis.

MATERIAL AND METHOD

We randomly selected 82 patients of essential hypertension from the outdoor of hospital, out of which 40 were of uncontrolled hypertension. All the subject were on antihypertensive drugs. Detailed case history, family history, duration of illness, drug type, regularity and diet pattern were questioned and recorded.All patients were looked for aggravating factors and questioned for warning signs of stress leading to hypertension.

Technique:-Modified Bhramari

Patient was instructed to take a slow deep abdominal breath, hold the breath lift the tongue and press it on the hard palate in Khechri Mudra, blow the cheek for better echo, close both ears with thumbs of both hands keeping them on concha simultaneously blocking the ear and tragus,both eyes are gently closed by index finger. The index finger should rest on lateral wall of nose. Both middle fingers are put on ala of nose, mouth is closed on both side, upper lip by ring fingers and lower lip by little fingers. Both eyes are focused in Shambhavi Mudra at the Ajnachakra in between both eye brows. Eye should be relaxed and open but eyelid closed to visualise the

divya jyoti at Ajna Chakra. A constant rhythmic uninterrupted specific frequency sound (mouth closed) is generated. Spiritual concentration is focused on Dwarika Dhish (Diety). After complete exhalation, (hold the breath out), Vahya Kumbhak is enforced with Jalandharbandh and spiritual focus on lord Shiva(Diety). Keep holding the breath out as long as possible. Visualisation is the most important aspect of meditation, relax during the whole procedure visualise the divya jyoti at ajna chakra, give a command of relaxation achieve a thought less (shunya chittavrti) state repeat the cycle to maximise but at least 7 times.

Inclusion Criteria-

Age 35-65 years Moderate hypertension. Systolic 140-180.mmof Hg and diastolic 90-109 mm of Hg (2017 AHA guidelines)

- On antihypertensive therapy
- No sign of cardiac complication
- Apparently healthy
- Living in the vicinity of our hospital

Exclusion Criteria-

- Cardiac or neurological Complication
- Secondary hypertension
- Thyroid disorder
- Uncontrolled diabetes mellitus
- Addiction to alcohol
- Abnormal kidney, liver function
- Irregular follow up

Blood Pressure (BP), pulse rate (PR), Oxygen saturation (Spo2) were monitored before and after meditation. The patient was instructed to sit comfortably and do Bhamari Pranayama. The data was collected, compiled tabulated and analysed for PR, BP-systolic and diastolic, oxygen saturation before and after ten minutes of meditation and Pranayam.

RESULTS-

The maximum number of patients were in the age group of 45-55 years (Table I) the most common aggravating factor was sedentary life style (90%) followed by work stress (30%) (Table II). The commonest warning symptom was tiredness (67.5%) followed by weight gain (62.5%) and sleep problem (62.5%) (Table III). The commonest warning symptom observed in our study was in male Indigestion (35%), Pain(30%), and tiredness while in females it was, sleep problem (40%), acidity (40%) and tiredness.

There was reduction of 18mm systolic and 12mm Hg in diastolic blood pressure. Systolic BP decreased from 156 +-14 to 130 +-12 and diastolic dipped from 100+-10. mm of Hg to 86+-6 mm of Hg. The pulse rate dropped to average 8 beats/minute after ten minutes of modified Bhamari Pranayam.

Table I - Age & Sex Distribution

Age Group	Male		Female		Total	
	No.	%	No.	%	No.	%
35-45	6	15	10	25	16	40
45-55	10	25	8	20	18	45
55-65	4	10	2	5	6	15
Total	20	50%	20	50%	40	100%

Table II - Aggravating Factors of hypertension

Symptoms	Male		Female		Total	
	No.	%	No.	%	No.	%
Obesity	12	30	9	22.5	21	52.5
Insomnia	4	10	11	27.5	15	37.5
Junk Food	2	5	-	-	2	5
Tobacco Chewing	9	22.5	2	5	11	27.5
Alcohol Consumption	5	12.5	-	-	5	12.5
Sedentary life style	16	40	20	50	36	90
Work Stress	9	22.5	3	7.5	12	30
Diabetes	5	12.5	8	20	13	32.5

Table III - Warning Signs of Stress

Symptoms	Male		Female		Total	
	No.	%	No.	%	No.	%
Headache	3	7.5	8	20	11	27.5
Body ache	8	20	11	27.5	19	47.5
Tiredness	11	27.5	16	40	27	67.5
Exhaustion/Trembling/Shaking Teeth	2	5	9	22.5	11	27.5
Clenched Jaw/Grinding	-	-	1	2.5	1	2.5
Cold and Sweaty Palms	5	12.5	9	22.5	14	35
Stiffness in neck Face or Shoulders	12	30	7	17.5	19	47.5
Sleep Problems	9	22.5	16	40	25	62.5
Tachycardia	2	5	8	20	10	25
Indigestion or acid reflux/increase/loss of appetite	14	35	16	40	30	75
Weight Gain	12	30	13	32.5	25	62.5
Sexual Difficulties	9	22.5	6	15	15	37.5

Table IV - Response of Bhamari Pranayama on vitals

	Before Bhamari	After Bhamari
Systolic	156±14	130±12
Diastolic	100±10	86±6
Pulse Rate	82±8	74±6

DISCUSSION

In our study there was significant reduction of mean systolic 18mm and diastolic 12mm Hg of blood pressure.

The higher pulse rate may be due to higher sympathetic activity, while Parasympathetic predominance, cortico-hypothalamomedullary inhibition and release of DHEA helps in reduction of heart rate. It is a sign of improved cardiac efficiency.

In previous study Arora and dubey has observed by chanting Om for five Minutes a fall of 14/05 mm of Hg⁹. Previous studies conducted by Barnesetal has observed similar results¹⁰.

In a Cochrane review conducted by Hartley et al. diastolic blood pressure was lowered significantly in majority of studies¹¹.

The Bhamri Pranayam deep abdominal breathing reduces sympathetic activity, enhances parasympathetic activity, enhances homeostasis leading to release of DHEA and serotonin.

If we keep in mind and observe the warning symptoms and avoid aggravating factors by scheduling the day, healthy potassium rich diet with exercise (Yoga) hypertension is hundred percent preventable.

CONCLUSION-

Bhamri Pranayam, focused concentration (Shiv Dhyam) and slow deep abdominal breathing with extended exhalation leads to calmness reduces hyperactive sympathetic activity and enhances parasympathetic activity. The average lowering of blood pressure was observed by 18/12mm of Hg. and pulse by 8/minutes. Regularising the life style, avoiding excess salt, processed food, adding potassium and chlorophyll enhanced diet with timely 8 hours sleep may further reduce the overall prevalence of hypertension and prevent associated, cardiac and other complications. Limiting the ambitions (Aparigrah) and converting distress to eustress by positive attitude yognidra and meditation may result in life time benefit.

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