



MANAGEMENT OF HYPERTENTION THROUGH YOGIC PRACTICES

Siddappa Naragatti

Central Council for Research in Yoga and Naturopathy New Delhi-58

Article history:

Received: 9th November 2018

Received in revised form:

22th November 2018

Accepted: 6th December 2018

Available online:

December 2018

*Corresponding author:

Siddappa Naragatti

Email:

siddappa.naragatti@gmail.com

Present address:

Central Council for
Research in Yoga and
Naturopathy New Delhi-58

These authors have no conflict
of interest to declare.

Copyright © 2011,

All rights reserved

Abstract

Yoga is an ancient science of holistic health and living which offers a unique lifestyle management not only for management of many common psychosomatic disorders but also for prevention of diseases, preservation and promotion of health. Yoga, in fact, gives due importance to different layers of existence namely, recognition of disease by the process of purification, harmonious interaction and development, conscious control of many physiological, biochemical, neurological, psychological etc. functions for maintaining a positive health. Yoga being a science of integration of human consciousness with Nature and transcendental consciousness calls into play each and every facet of personality-body, mind, intellect, emotion, ego, relationships of all of them with external environment. The objective experimentation is the most important aspect of searching the truth employed by modern science that search into many practices of yoga demands both subjective as well as objective tools for understanding the effects for further application and wider acceptance. While laying too much importance on the objective variables, researchers-conducting study in yoga tends to miss many subjective aspects of a diseased person. In fact, yoga treats the individual as a whole while modern science conducts research concentrating upon a particular organ or a disease. This demands contemplation, further study and a new approach to yoga research in the management and prevention of diseases and preservation and promotion of health. Studies conducted on many yogic practices for the management of hypertension around the world by researchers and experts were lopsided, though revealed very important information and suggested possible role as an alternative and adjunctive mode of treatment.

Key Words: Management Hypertension Yogic Practices, Lifestyle Intervention, a new approach to understand Holistic effects on the individual as whole.

INTRODUCTION

Hypertension is better known as High Blood Pressure. A large number of our population suffering from hypertension as two-third of whom are under 60 years of age. This indicates that this condition is not inevitable result of ageing but rather a condition affected by a number of risk factors including smoking, obesity, stress, alcohol consumption and a diet high in fats and sodium chloride, diabetes and family history of hypertension.

Women are more likely to have high blood pressure than are men. People with family history of high blood pressure, heart disease, or diabetes, pregnant women or women who take birth control pills. Who drinks exclusively. Smokers who eat foods high in fat or sodium, are anxious or depressed may have over twice the risk for high blood pressure than those without these problems. It is not clear whether these mood disorders contribute to high blood pressure due to some physiologic effect on blood vessels or if they may lead to behaviors, such as weight gain or alcohol abuse which are also risk factors for hypertension. Anger does not appear to predict high blood pressure, although suppressed anger may. Seasonal changes may influence variations in blood pressure with hypertension increasing during cold months and declining during the summer, particularly in smokers. While cold may narrow blood vessels, lack of light has been associated with higher blood pressure.

Nearly about 95% reported hypertension cases in the United States, the underlying cause cannot be determined. This type of high blood pressure is called essential hypertension. Patients who suffer organ damage as a result of high blood pressure are said to have Malignant hypertension; the diastolic pressure in such case usually exceeds 130. Malignant hypertension is a dangerous condition that develops rapidly and requires immediate medical attention.

When a direct cause can be identified, the condition is described as secondary hypertension. Among the known causes of secondary hypertension, kidney disease ranks highest. The condition can also be triggered by tumors or other abnormalities that cause the adrenal glands to secrete excess amounts of the hormones that elevate blood pressure. Birth-control pills and pregnancy can boost blood pressure, as can medications that constrict blood vessels.

Though essential hypertension remains somewhat mysterious, it has been linked to certain risk factors. High blood pressure tends to run in families, for example, and it is more likely to affect men than women. Age and race also play a role. In the United States, African Americans are twice as likely as Caucasians to become hypertensive, although the gap begins to narrow around age 44. After age 65, African-American women have the highest incidence of high blood pressure.

Hypertension is the technical name of high blood pressure. It is measured by placing an inflatable cuff around the upper arm. As the cuff is inflated the arm is squeezed tight and at this point pressure cannot be heard through the stethoscope. As the cuff is slowly deflated the pulse is heard again. This is the high number and is called systolic pressure, when the heart is contracting to pump blood out into the body. As second reading is taken as the cuff is deflated even further and the pulse sound disappears again. This is the low number and is called the diastolic pressure. At this time heart is relaxing to refill the blood. It is a rare physical examination that does not include blood pressure measurement. Patients should not smoke or drink caffeinated beverages within 30 minutes of the measurement. Although this test has been used for more than 90 years, it is not completely accurate. A person who has recently exercised or a heavy smoker who has not smoked for a while can have a temporarily low pressure reading. Temporary high pressure can result from an arm cuff that is too small, talking during the test, or from having recently eaten foods that raise blood pressure. If first blood pressure is above normal, the health professional may take two or more measurements separated by two minutes with the patient sitting or lying down, as well as one taken after the patient has been standing for two minutes. Even if blood pressure remains mildly elevated, it may not indicate hypertension.

Normal blood pressure people below 130/85 should be rechecked every year. Anyone whose blood pressure is high normal 130-139/85-89 or above should have their blood pressure monitored at home and is evaluated for organ damage. If white-coat hypertension is suspected, home monitoring is more important in order to avoid unnecessary drug treatments. Studies have suggested that white-coat hypertension actually may pose a risk for further heart problems, although the increased danger appears to be small (7.9%) compared with the risk in those with steady mild hypertension (22%). An individual with mild to moderate hypertension found during a

firstly examination and who has no evident organ damage should be retested at latest twice over several weeks. An average of all the measurements will be considered in the diagnosis of hypertension. Persons with very severe high blood pressure or those exhibiting any evidence of organ damage due to hypertension should consider drug therapy immediately.

W.H.O has recommended that blood pressure of 160/95mm of Hg or above in adults should be considered as "Hypertension"

Classification of Hypertension:

Primary or Essential Hypertension: Cause not known, commonest form of hypertension accounting for about 90% of all cases. It is a transient hypertension occurring at time to nervousness, emotions or activity and fixed even at rest. It indicate the absence of any discoverable extra-vascular causes but in majority of cases the causes are largely unknown. Clinical observation have identified number of risks factors such as heredity, weight, salt intake, stress and strain of life, alcohol, oral contraceptives, other drugs and poisons, saturated fatty foods, smoking, tobacco chewing etc.

Secondary Hypertension: cause is known A variety of pathological process have been known to be responsible for secondary elevation of blood pressure. They may be diseases of kidneys, Diabetes, Tumors of adrenal and pituitary glands, congenital narrowing of aorta, endocrinal causes such as hypothyroidism, hyperparathyroidism and toxemia of pregnancy.

Symptoms of Hypertension:

Majority cases, there are no clear warning signs of hypertension. If symptoms do occur, they may include Headaches, chest pain or tightness, nosebleeds and numbness and tingling, may have severe hypertension. Excessive perspiration, muscle cramps, weakness, palpitations, and frequent urination may have secondary hypertension, possibly caused by a tumor or an adrenal gland disorder, and emotional instability.

A Tool to Alternative Management of Hypertension :

Yoga is an ancient science that claims to its practitioner- a physical, mental, spiritual well-being. The notion of self-perfection or realizing the highest state of consciousness has yet to verified objectively and subjectively by the scientists and researchers.

Secondly, there are many schools of yoga and more than 50 groups of practices with subgroups and total practices range between 500-1000 that includes of asana (physical postures more than 500 are known to modern people), pranayama (100 types of breath regulation techniques), pratyahara (a technique to relax the surface mind and bring muscular, emotional and mental relaxation), Dharana (a practice of holding mind to desired object for awakening inner faculties, Dhyana (more than 500 different practices of meditation are known) and many other practices. There are references of many diseases and their treatment as well but it is difficult to find specific mention of positive health and holistic lifestyle for physical, mental, emotional, intellectual and spiritual well being where spiritual awakening or altering the state of consciousness has been mentioned frequently in almost all scriptures of yoga.

Yoga or the Yogasutra is mostly authoritative ancient scripture on yoga. Yoga developed around 5,000 years ago according to the researchers. The early writings of yoga were transcribed on palm leaves and wooden blocks that could be easily damaged and destroyed. Yoga is part of Vedic literature and was proposed by Maharishi Patanjali. Yoga comes from a Sanskrit word Yuj which means the union of the individual and universal consciousness. So an individual practicing yoga not only has a relaxed lifestyle but can also reach the ultimate destiny of life.

Yoga is a perfect mixture of physical postures or exercise, breathing methods, meditation, deep relaxation that bring about physical, mental and spiritual stability. Some of the major effects of yoga observed are:-

1. Depression: It is the most common problem in women health leading to many others regulated. Breathing exercises mainly help to reduce distractions and thus depressions. Yoga brings about changes in electrophysiology and neurotransmission thus reducing depression.
2. Fatigue: Our body can feel fatigue due to number of reasons. Use of yoga, yoga asanas, etc. facilitate increased blood supply to all parts of body and thus increased oxygen supply. Some of the exercise include big toe pose, bound angle pose, bow pose, camel pose, cobra pose etc.
3. Anxiety and anxiety disorders: A state of excessive uneasiness, worry, or fear of unknown things is called anxiety and anxiety disorder, which needs to be and treated. Regular yoga practice can reduce the feeling of restless this can be achieved

by a complete package of asanas, pranayamas that create a new positivity. Some of the exercises includes cat stretch pose, bridge pose, fish pose, bow pose, downward-facing dog, headstand pose, corpse pose.

4. Stress: Regular practice of yoga triggers some of triggers the points and thus reduces stress and makes one feel relaxed. Some of the poses are easy pose, cow pose, extended puppy pose, seated forward pose etc.
5. Improved sleep: Most people complain about sleep. Irregular sleep patterns are due to a number of reasons which is most common in middle aged women. Yoga is most effective to reduce this problem, some of the poses are hero pose, cat pose, cow pose child's pose etc.
6. Physical Fitness: Yoga increases oxygen supply to all body parts, increases blood flow betters bone health, builds muscle strength, improves flexibility, protects spine etc.
7. Sympathetic and para sympathetic activation: The different poses or the asanas of yoga stimulates the nervous system and nerve signaling. This helps the body and mind to relax and brings about healing effect in body.
8. Cardiovascular health: Yoga is a practice that emphasizes breath, focus and meditation. This is thus a healthy and natural alternative for heart health it reduces BP, removes bad cholesterol levels, boosts blood circulation, increases lung capacity and improves heart health.
9. Menopausal Symptoms: Menstruation is a natural phenomenon in women but in middle age or late 40's when menstruation comes to an end , it leads to many other problems thus regular practice of yoga improve health.
10. Mood swings: Mood swings is common problem in women this is caused by improper lifestyle yoga bring about relaxation. Meditation increases oxygen supply to brain reducing carbon content and improves mental and physical health.
11. Glucose regulation: Improper diet and stress causes diabetes. Yoga is not only a exercise but also a method to keep our body and minds in peace. Thus Prevents diabetes.
12. Hormone imbalance: Yoga triggers all the parts that is all the organs in body thus stimulates and also improves hormones regulation in the body.

A regular practice of yoga helps an individual to gain inner peace thus improves mental health this mainly due to the meditation and other breathing exercise whereas physical poses help an individual to attain physical fitness. Middle aged women itself were considered in this study as the women fail to take care of themselves in the busy schedules and most of serious health problems such as glucose intolerance, hormone imbalance, etc occur in the middle age itself. From this studies it was noted that the health conditions of women practicing yoga improved. Yoga is the only path for both physical and mental wellness and has no side effects.

REVIEW OF LITERATURE AND RESEARCH STUDIES OF YOGIC MANAGEMENT OF HYPERTENSION

Now a days yoga attracted global attention and studies on yoga practices were scattered when it stated in early 1920s. initially many researchers were amazed to find certain definite changes at physiological, biochemical, and neurological and psychological levels. Recent studies conducted on the effects of yogic practices many researchers, infact, summarizes the positive effects of yogic practices in the course of six months yoga training suggest the following changes.

1. Parasympathetic dominance or autonomic equilibrium, gradual decline of blood pressure and heart rate. Positive changes in ventilation, oxygen consumption, mean skin temperature, blood catecholamines, cortisol etc. shows autonomic equilibrium. A stable autonomic nervous systems points to a positive delay in wear and tear in physiological systems as anabolic activity predominates and minimizing the adverse effects of stress related disorders.
2. Dr. Selwamurthy observed that the cardiovascular regulation to orthostasis (blood pooling in lower parts of the body) a known to occur in prolonged standing, shows improvement as indicated by efficient cardiovascular adjustments to 70° head up tilt in asana. The degree of increase in heart rate due to orthostasis is lower and even with minimum increase in heart rate, the blood pressure could be maintained at optimal level thereby economically and efficiently preventing the collapse. The studies suggested that it tones up nervous and endocrine systems.

3. There is marked improvement in thermoregulation efficiency which involves balancing the heart loss and heart gain through hypothalamic thermostat mechanisms as well as through autonomic neural and metabolic pathways.
4. Yoga practices helps in attaining mental tranquility and awareness as shown by Alpha activity falling in the range of 8-13Hz. The increase in alpha activity in the brain helps in maintaining poise and calm even during adverse conditions.
5. Yoga practices helps in improving the exercise performance as sub maximal level, possibly due to alterations in energy metabolism. It further helps in muscular efficiency by increasing the endurance time. Body flexibility is greatly increased especially at all-important joints by yoga practices thus prevents disorders of skeleton muscular systems.
6. The electrophysiological activity of muscle shows marked improvement suggesting quicker relaxation of muscles resulting in greater efficiency and coping easily with physical stress. Yoga practices leads to healthy metabolic profile which is indicated by many biochemical changes-blood glucose, cholesterol, dopamine B-hydroxylate decreased while monoamine oxidase, lactic dehydroenase, plasma cholinesterase and urinary excretion of 17-hydroxy and 17-keto steroids showed significant increase.
7. There is marked improvements in memory, concentration, learning efficiency and psychomotor performance and reaction time by the yoga practices.
8. Baro reflex activity if diminished may results in essential hypertension as seen many patients. High blood pressure shows a gradual decline after six months of yoga practices and restoring the normal sensitivity of baroreflex mechanism. Once the normal activity of the baroreflex is restored, it helps in restoring the health of autonomic vasomotor control system. Even some anti-hypertensive drugs are reported to bring about increased sensitivity of baro reflex either centrally or peripherally.
9. There are many subjective changes- feeling of well being, mental peace and tranquility, [poise, parasympathetic dominance, influx alpha wave in the brain, enhanced awareness, exercise tolerance, maintaining thermostat even in adverse conditions, greater flexibility, reduction in stress due to significant changes in GSR, Blood lactate and urinary vinyl mandelic acid (U-VMA), reduction in anxiety score, reduction in depression level, significant improvement in

concentration and in vigilance further opens the door to more refined studies for clear and deeper understanding of yoga practices.

YOGIC PRACTICES AS A THERAPY FOR HYPERTENSION

Yogic practice is holistic living, it means conscious correct living in every moment. Every moment requires extraordinary awareness, conscious control and transformation of what is not desired or harmful for and in life- negative attitudes, habits detrimental to health, unconscious drives and movements, regulation in physical, emotional and mental activity while constantly evolving the mind to higher states of consciousness. Further yoga aspires to take every human being to a state of consciousness that is beyond stress, free from all conflicts, a balanced but detached way of living at material level while living within or in a state of consciousness guided by love, energy awareness and harmony . Sri Aurobindo, a great master of Yoga told, "Yoga is self-conscious finding". A lifestyle and living if regulated by higher state of consciousness which is itself full of love, delight, peace, harmony, wisdom, truth will bring about a transformation in individual and health, prevention, management of disease will come as byproducts.

Yogic practice for high blood pressure should include practices for all levels- physical, mental, emotional, spiritual and social levels. The increased endurance and elasticity of body, stamina and vitality, higher level of awareness to remain detached with outer events and condition that brings conflicts, stress, anxiety and depression, learning emotional poise which prevents any emotional upsets and outbursts, mental peace and tranquility, calm and relaxed, least excited of brain for maintaining normal activity of brain and nervous systems. Yoga is a philosophy in which living is directed to realize one's potential in the world that will help in deciding the aim and purpose of life guided by peace, harmony, love, success and creativity. Yoga is a science that offers regulation of all activities of living. It is an art of living consciously in joy at all time, irrespective of any conditions, events and circumstances .

An integrated practice of yoga for hypertension offers unique management program rather than lopsided, fragmented practices of yoga it is easy to practice an integrated program of yoga while understanding its philosophy about human

frame, human frame is considered as having five layers- interacting with one another results into harmony, health and happiness. Five layers of existence which covers the real self or the highest state of consciousness. It is the consciousness which manifests in all these layers but remains unaffected and is full of attributes of peace, harmony, delight, health, truth and bliss.

One hour yogic practices must be include the following practices-

1. Contemplation upon the aim of life as truth, wisdom and health, harmony and happiness. This can be done by many practices of prayers, couplets seeking truth, aspiring for truth, manta, chanting – 5 minutes.
2. Breathing Practices for enhancing the level of awareness of self or withdrawing the scattered mind with for physical, mental and emotional relaxation as well. Conscious correct breathing is key to good health, autonomic balance and positive impact on many biochemical and metabolic functions-10 minutes.
3. Asana practices should be selected and useful for hypertension like Padmasana, Suptapavan Muktasana, Sarvangasana, Paschimottanasana, Vajrasana, shavasana, Makarasana, Gomukhasana, Trikonasana, Tadasana, Ardha Matsyendrasana Shalabhasana, Minimum five asanas may be selected depending upon the flexibility and constitution of the body-20 minutes.
4. Pranayama breath regulation techniques like Ujjayai, Anulom Vilom, Shitkari and Seetali are good. Any one or two may be selected for practice in the beginning- 10 minutes.
5. Relaxation practice- 5-10 minutes
6. Meditation- 20 minutes
7. Swar yoga yogic practice recommends change in flow of breath to left or left flow dominance of nostril can bring down high blood pressure. A knowledge and practice of swar yoga should be given so that practice can be done by patients preferably at home. In office and even in the midst of daily chores and routine activities.
8. Change of lifestyle, food habits, sleeping habits, waking early and sleeping early, relationships based on Harmony, following principles of life and yoga for constant evolution consciously can be practiced and applied anytime.

CONCLUSION

Yoga is a way of life and living which demands conscious effort on the part of practitioner. This conscious effort brings changes in the whole personality, attitude, lifestyle is in fact a way of transformation of life, mind and body. Studies conducted around the globe suggest positive changes at physiological, biochemical, psychological levels that are bound to bring an integrated approach in the management while standardizing the techniques and tools applied for wider acceptance and application amongst researchers and scientists. While there should be conscious effort required even amongst these scientists to recognize and develop tools that can help in better understanding of subjective changes take place while following yogic lifestyle. But it is sure that lifestyle changes brought about by yoga can either act as an alternative mode of management of hypertension.

REFERENCES:

1. Anand B.K., G. S. China and B. Singh, "Studies on Shri Ramanand Yogi during his stay in air tight box", Indian Journal of Medical Research (Indian J. Med.Res.), 49 (1961), pp82-90.
2. Anand B.K. and G.S. China, "Investigation on Yogic Claiming to stop their heart beats" Indian Journal of Med. Res., 49 (1961), pp9-4
3. Anantharaman V., and S. Subrahmanyam, "Physiological Benefit in Hatha Yoga Training", The Yoga Review, 3(1983), pp9-24
4. Bodis Wollner, 1. & Diamond, S.P. The measurement of spatial contrast sensitivity in the case of blurred vision associated with central lesions. Brain 99.695-710.
5. Brown. D. ForteM. & Dysart. M. (1984a) Visual sensitivity among mindfulness mediators and non-mediators. Perceptual and Motor Skills.58.727-733.
6. Brown. D. ForteM. & Dysart. M. (1984b) differences in visual sensitivity among mindfulness mediators and non-mediators. Perceptual and Motor Skills.58.775-784.
7. Cacace.A.T., Satya-murti, S., & Wolpaw, J. R.(1990), Human middle latency auditory evoked potentials: Vertex and temporal components. Electroenceph Clin Neurophysiol.77.6-18.

8. Campbell.F.W., & Green, D.C.(1965). Optical and retinal factors affecting visual resolution. *Journal and Physiology*.181.576-593.
9. Anand B.K. China, G.S and Singh. B. "Studies on Shri Ramanand Yogi during his stay in an air tight box", *Indian J. Med.Res.* 49 (1961), 82.
10. Anand B.K. China G. S. Investigations on yogic Claiming to stop their heart beats" *Indian Journal of Med. Res.*, 49 (1961), pp90 .
11. Wallace, R.K.Benson, H and Wilson, A.F. Wakeful hypo metabolic physiologic state. *Am J Physiol*221(1971)795.
12. Salgar D.C. BisenV.S. and Jinturkar, M.J.Effect of Padmasana. A yigic exercise on muscular efficiency, *Indian J.MedRes.*63(1975)768
13. Udupa,K.N.Singh, R.H. and Settiwar, R.M.Physiological and biochemical studies on the effect of yoga and certain other exercises. *Indian J Med Res* 63(1975)620.
14. Cooper, R. Charton, J.W. and shaw, J.C. EEG technology, (Bulters worth, London) 1969 p 152.
15. Nelson. N in: *Methods in enzymology*, Vol.3 S.P. colowick and N.O.Kaplan Eds. (Academic Press Inc, New York)1957 p 85.
16. Lowry. O.H. Rosenbrogh, N.J.Farr, A.L. and Randall, R.J. Protien measurement with Folin Phenol reagent. *J Biol Chem* 193 (1951)265.
17. Mondkar. A.D. Agnihotra and microbes, a laboratory experience *Bharatiya Satsang*,7.3-34, 1986.
18. Mulay, S.G. Why how what about homa therapy *bharatiya Satsang*,8:1-8, 1987.
19. Rathner. B. Homa therapy goes again to the laboratory *Bharatiya Satsang*, 6:1-12, 1985
20. Saltin, B. Henriksen, J., Nygaard, E. and Anderson, P. Fibre types and metabolic potentials of skeletal muscles in sedentary man and endurance runners. *Ann NY. Acad Sci* 301(1977)3.
21. Anantharaman V., and S. Subrahmanyam, "Physiological Benefit in Hatha Yoga Training", *The Yoga Review*, 3(1983), pp9-24
22. Benson, H., J.W.Lehamann, M.S. Malhotra, R.F. Golden, J. Hopkins and M.D. Epsten, 'Body temperature changes during g Tum-mo Yoga,' *Nature* 295(1982), pp.234-36.

23. Datey, K.K., S.N.L. Deshmukh, V.P. Dalvi and L.S. Vinekar, (Shavasan) Yogic exercise 1 management of hypertension', Angiology Research Foundation, 29 (Los Vegas, 1969), pp325-33.
24. Joseph S K Sridharan, S.K. B. Patil, M.L. Kumaria, W. Selvamurthy. N.T. Joseph and H.S. Nayar, 'Study of some physiological and biochemical parameters in subject undergoing yogic training', Indian J Med Res, 74(1981), pp75-82.
25. Mohan M., U.C. Rai, V. Balavital, D.P. Thombre and Swami Gitananda, 'Cardiorespiratory changes during savitri pranayama and Shaasana' the yoga Review, 3(1983), pp25-34.
26. Nayar, H.S., Mathur and R.S. Kumar, 'effects of yogic exercise on human physiological efficiency', Indian J Med Res 63(1975) pp1369-76.
27. Patel, J. 'Yoga and Biofeedback in the management of Hypertension', Lancet, 2(1973), pp 1053-55.
28. Rao P.S. 'Oxygen consumption during yoga type of breathing at altitudes of 520 meters and 3600 meters. Indian J Med Res 56(1968) pp.701-05.
29. Ray, U.S. K.S. Hegde and W Selvamurthy, 'Improvement in muscular efficiency as related to a standard task after yogic exercises in middle aged man', The yoga Review, 3(1983), pp75-9
30. Ray, U.S. K.S. Hegde and W Selvamurthy, 'effects of yogic asanas in middle aged man physical exercises on body flexibility in middle aged men', The yoga review, 3(1983), pp343-48.
31. Sahay, B.K., B. Sadsivudu, Ramananda Yogi, C. Baskaracharyulu, P.S. Raju, S. Madhavi, M.V. Reddy, N. Annapurna and K.J.R. Murthy, 'Biochemical Parameters in normal volunteers before and after yogic practices', Indian J Med Res., 75(Suppl.)(1982), pp144-48.
32. Selvamurthy, W, 'Physiologische effekte des yoga training', Z. Phys Med Baln. Med. Klim 12 (1983), pp-295-301.
33. Selvamurthy, W., H.S. Nayar, N.T. Joseph, 'Physiological effects of yogic practice', Nimhans J., 1 (1983), pp77-80.
34. Selvamurthy, W., 'yoga and Health' Health and personality, 2 (1986), pp. 16-9.
35. Selvamurthy, W., M. Deshpande, S. Mukhopadhyay, U.S. Ray, L. Thakur and J.P. Anand, " Physiological effects of mantra on mind and body", National Conference on mantra on yoga. (New Delhi 4-5 November 1989).

36. Sinha, K.C. W. Selvamurthy, K, Sridharan R.S. Tiwary, U.S. Ray L. Thakur, U Radhakrishnan 'Role of Baroreceptor mechanism in essential hypertension', Ministry of Defence Report No. DIPAS/3/8/85 on project No.RD-P-83/DIP-131, 1985.
37. Stanescu, D C B Nemery, C, Veriter and C Msrechel, 'Pattern of Breathing and ventilator response to Co2 in subjects practicing hatha yoga', J Appl. Physiol: Respiratory, Environ. Exercise Phisiol., 51 (1981), pp. 1625-29.
38. Selvamurthy W., Yoga for everyone-A physiological View, J. Oriental Research, 63:7-32,1996.

How to cite this article:

**Siddappa Naragatti, Management of hypertention through Yogic practices;
*International Journal of AYUSH 2018:7(4) 41-54***