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Frontiers

Effects of Laghoo Shankha Prakshalana (LSP) on Blood Pressure: A Pilot Study

A pilot study to conduct a detailed scientific research to establish the benefits of Laghoo Shankha Prakshalana (LSP) among individuals (volunteers) suffering from Hypertension, Diabetes mellitus and Chronic Inflammation and also the general public.
Under the guidance SWAMI VAJRAPANI SARASWATI
Shiv Darshan Yoga Vidyalaya affiliated to Bihar School of Yoga
And
Under the supervision of SWAMI GAMBHIRANANDA SARASWATI,
At Shiv Darshan Yoga Vidyalaya, Chennai on volunteers who included both general public and patients suffering from Hypertension, in order to establish the ideal sample size and safety of the research.

Introduction:

The Present day living is accompanied by stress and pressures on physical, mental, social, economical and spiritual well being of every human being. As a result, the list of human disorders and diseases are ever increasing at a rapid pace. Yoga relieves the stress and anxiety factor in human life and promotes peace of mind and good physical health for the individual that translates into family and social well being. Yoga relieves muscular, mental and emotional tension. This is fundamental benefit of yoga which leads to a fruitful life. Our nation and the whole world propagate the beneficial effects of yoga on the mind and the body. Also, the public interest and demand for scientific proof of the beneficial effects of yoga in terms of chronic diseases and disorders are also increasing day by day.

A number of people who suffer from chronic specific disorders like Hypertension, Diabetes mellitus and other chronic inflammatory disorders also request for specific yoga therapy for their problems. Scientific research has already proved beyond doubt the significant health benefits of Yoga Therapy on the above disorders. Several such scientific researches have been successfully conducted at our center (SDYV) since its inception. Laghoo Shankha Prakshalana (LSP) is one such very simple, effective and beneficial Kriya of yoga therapy.

The work of Swami Satyananda Saraswati and his Co-workers has established trend to use Asanas, Pranayama, Kriyas, and meditation in dealing with hypertension, along with regular medications, if any. Inspired by the researches carried out in Bihar School of Yoga and Bihar Yoga Bharati, Munger under the guidance PARAMHAMSA Swami NIRANJANANDA Saraswati and in the supervision of Swami Vajrapani Saraswati, we have proposed to conduct a detailed scientific research to establish the benefits of Laghoo Shankha Prakshalana (LSP) among individuals (volunteers) suffering from_Hypertension, Diabetes mellitus and Chronic Inflammation and also the general public. A pilot study was planned at Shiv Darshan Yoga Vidyalaya, Chennai on volunteers who included both general public and patients suffering from Hypertension, in order to establish the ideal sample size and safety of the

research. The details of the pilot study are presented as follows:
Review of Literature:

Hypertension:
Hypertension, in any of its many forms, is a serious disease. Even a mild case with very few symptoms (subjective experience of disease) lowers the life span and decreases the quality of the remaining years.
Hypertension is particularly dangerous as it is a 'silent' illness. Most people with high blood pressure show few or no symptoms of the disease for many years. Despite this, life-threatening consequences and complications can occur suddenly. The disease is usually complicated by one or more of the following - stroke (cerebrovascular accident), heart attack (myocardial infarction), kidney disease, dilatation of the aorta (aneurysm), and disease of the medium and small blood vessels of the body, causing tissue and organ damage. In the renal hypertension form, the kidneys are profoundly affected and eventually fail to function, leading to death within months or even weeks. In both mild and severe cases the arterioles are constricted, increasing the peripheral resistance. The blood pressure continuously remains at high levels; due to this, the vital internal body organs are damaged and fail in their respective functions.
Actually hypertension is not a disease in itself, but a sign that there are underlying problems in the management of the internal environment and balance of the body at the physical, emotional and mental levels. Modern Scientific Medicine has coined the term hypertension and this is exactly what the disease is, excessive tension in the body. It is tension of the whole body/mind complex, resulting in imbalance of the nervous system. Coordination of bodily functions is impaired and all systems, and those individuals who are predisposed to trouble due to weakness in this system, manifest disease on the physical plane. No doubt, if we look closely at the whole individual we shall see that there are problems at a deeper level as well.
Modern medicine has now realized that the mind plays at least some role in about 80 percent of disease, classifying this type of disease as psychosomatic, meaning 'of mind and body'. However, Modern Scientific Medicine has yet to discover the full implications of this insight, and is still seeking to clarify the role of the psyche in physical illness. The yogic comprehension of the role of the mind in psychosomatic disease is practically expressed in techniques designed to remove psychological stress and its bodily effects. This is achieved through meditation, asana (physical postures), pranayama (breathing exercises) and other means that will have important implications in the treatments of the future. The knowledge of yoga is especially relevant to high blood pressure as both heart and blood vessels respond very readily to fluctuations in the mind and emotions. An unstable mind leads to an unstable body, and mental or emotional disturbance reflects into the cardiovascular system producing various symptoms, including an increase in blood pressure.
What is hypertension?
Before we can understand what causes high blood pressure, we must understand what it is. Increased blood pressure results from the damming up of blood behind constricted arterioles, upsetting the balance of the heart and its vessels. Blood leaving the heart on its way to the cells of the body meets with excessive resistance, and the heart is therefore required to work harder to pump the blood through the narrowed vessels.
During times of rest the heart does not strain excessively because it does not have to deliver as much oxygen to the cells as it does during stress and exercise. However, the moment stress is placed upon the body, whether this be

physical or mental, the oxygen demand increases and so does the work of the heart. When this happens over an extended period of time, the heart becomes permanently strained and eventually does not function properly. This leads to serious and even lethal complications.

In hypertension the body cannot adapt to the needs of its internal and external environment. When arterioles have remained in a constricted state for a period of time, the muscles around them spasm. The blood cannot supply oxygen needs and at the same time it cannot pick up the waste material produced, resulting in fatigue and exhaustion. It takes a great deal of rest to undo the damage caused by this spasm. Recent scientific research has proved that the sort of rest required cannot be gained even through sleep, but only through meditation.

Lactic acid is a chemical by product of stress, manufactured in muscle tissue when the oxygen supply does not keep up with the work output and its oxygen need. This is not a healthy state, and lactic acid must be eliminated during periods of rest, notably during sleep. Physiological monitoring during meditation shows that there is a decrease in the activity of the sympathetic nervous system, relaxing constriction of the blood vessels. This leads to an immediate drop in blood pressure and increases blood flow to the muscles supplying needed oxygen and removing lactic acid. Researchers Wallace and Benson have shown that during meditation the level of lactic acid in the body decreases four times faster than during normal activity and three times faster than during sleep. This indicates that meditation is more efficient in repairing physical damage associated with hypertension.

Millions of years ago when our animal ancestors had to survive in a hostile environment, the sympathetic system was a lifesaver. This system is concerned with the stress response mechanism as explained by the scientist Hans Selye. He showed that there are three basic components of the stress mechanism:

1. Alarm is registered by the sympathetic nervous system which triggers the adrenal glands to release adrenaline, and the pituitary gland to release other hormones.
2. The second stage is continuation of neural and endocrine reactions until the stressful situation has passed.
3. The third stage is one of exhaustion as the human organism requires rest to restore balance to the body. If there is no rest the stress hormones and reactions accumulate and destroy the body.

This stress reflex is still activated by the body and mind in stressful situations. It is a basic instinctual response seated deep within the oldest parts of our nervous system. Although it was essential to our ancestors' survival in the early days of man's evolution, it is less so today. In fact it is often out of control and has become more destructive than useful. This reaction is the basis of much of the disease we suffer today, in the form of psychosomatic and stress related illness.

In some situations the stress reaction is necessary, but it is also something that must be properly controlled if it is to retain its usefulness to man and his society. For example, it is physiologically acceptable for the stress reaction to operate when our lives are being threatened, but if it operates when we are caught in a traffic jam or if we are late for work, then it serves no useful purpose. In the first situation the reaction powers our muscles and allows us to run or fight. In the second situation it triggers all the hormones and neuronal circuits but the energy liberated is not utilized. The hormones build up and create toxins and poisons which exhaust the body. Simultaneously, the sympathetic nervous system shuts down capillary beds and prevents enough oxygen from getting into tissues. This is associated with a feeling of frustration, tension, anxiety and loss of

mental clarity. There is an overall decrease in body efficiency rather than an increase.
The normal and non-neurotic way to handle stressful situations such as traffic jams and being late for work is to accept the situation as it is, in a relaxed and positive frame of mind. This occurs if we are aware that nothing can be achieved by undue worry. Survival and happiness today require that we tune into the overall situation involving ourselves, the people around us, and the total environment of the here and now. Perceptiveness, wisdom and oneness are the ingredients for effective action and survival in today's world. We must raise our consciousness above the animal instinctual level and become more truly human. This involves increased awareness of our own inner workings and greater control over ourselves.
A meditative attitude towards the world allows us to control the adrenaline release and the sympathetic over stimulation that accompanies most kinds of stressful situations. This is achieved through increased understanding of the inner workings of mind and brain, which is enhanced through meditation. When the mind becomes more relaxed it tends to view stressful situations in a completely different light. Instead of becoming frustrated by the little things of life, wider spaces are opened up to our view, and an inner world emerges that has as much, if not more, importance than the outer world. This is the world of intuition (inner knowledge and understanding) and by tuning in to this world of intuition we can prevent disease and remove hypertension from our lives.

Do you have hypertension?
Many people have elevated blood pressure without knowing it. For the majority, hypertension is not firmly established but becomes noticeable through its symptoms. Then, when the stress or emotional tension is removed for a while, the blood pressure drops. This is called labile hypertension and is thought to be the precursor of essential hypertension.
Hypertension is caused by the stresses and strains of modern living. If you are in any way subject to these stresses and feel they are affecting you, then you have a chance of getting hypertension. Whether or not this actually occurs depends on your own constitution; whether or not you are predisposed to suffering increased blood pressure, ulcers, or some other form of disease. Everyone has his or her own weak point.
To know whether you have hypertension or not, you must ask yourself the same questions a doctor might ask if he were examining you for high blood pressure. This is called taking a medical history. The doctor then conducts a full physical examination and, if required, may carry out some laboratory procedures. These questions would be foremost in his mind:

How long ago was your last physical examination?
In this way the doctor can check up and compare what your blood pressure was last time it was taken and see if there has been any significant change.

Is there a family history of hypertension?
If other members of your family or close relatives have had hypertension, then it is more likely that you will also suffer from the same type of condition.

Have you ever had kidney trouble, protein in your urine or any type of urinary disturbance?
Kidney disease is one of the treatable and reversible causes of high blood pressure, and must be eliminated from a list of possible causes before starting treatment for essential hypertension.

Have you had any of the following symptoms that could imply hypertension?

These are: headaches at the back of the head, especially in the morning; palpitations which are sudden and quite perceptible, increased speed of the heart, like a thumping in the chest; nervousness; dizziness; light headedness; lassitude; apathy; depression; anxiety; uncomfortable feelings inside that cannot be explained; increased irritability; emotional upset.

Have you had any of the following symptoms that could suggest a more serious degree of hypertension?

They are: headache, breathlessness, palpitations, confusion, feeling of fullness in the head, disturbance of vision, sleeplessness, flushed complexion, loss of appetite, decreased memory and concentration, nausea (a feeling of wanting to vomit), spinning feelings.

Do you have any evidence of heart disease, kidney disease, thyroid disease, or adrenal over-activity?

These can only be answered by a competent doctor. If you can answer yes to any of the above then you should contact a doctor and a competent yoga teacher who can help you to remove such troubling symptoms. If you feel even slightly unwell it is the first sign of some inner disturbance which could lead on to more serious disease. Therefore, you should take such signs seriously and do something constructive about removing them. The most positive step you can make is to start to practice yoga, as this will not only remove symptoms but also prevent further disease. You should be aware too, of the possibility of being a potential candidate for high blood pressure if you lead a hectic life full of worries and concerns that often make you feel tense and unhappy. If you feel unhappy about any aspect of life then this is the potential start for future disease.

Personality Profile

Though many people of varied types and personality suffer from high blood pressure there is one type of person who is by far in the majority – the young or middle aged business man. Friedman and Rosenman, both heart specialists and dealing particularly with the cardiovascular system, state that in their medical practice (reflecting the American situation) they found typical cardiac patients had in common a competitive, aggressive, ambitious, stressful lifestyle. They demonstrated that almost all their patients were ambitious career men. This, however, should be kept in perspective. Most of the 700,000 Americans who died from high blood pressure in 1976 were businessmen in the middle of vigorous careers. In the same year it was estimated that million Americans suffered from hypertension, and the number is steadily growing. Due to increasing numbers of hypertensive patients, doctors are adding the term 'hypertensive epidemic' to their vocabulary.

If the above description fits you then you should take note and be warned of the possibilities. The best solution for those people who are not prepared to give up their lifestyle because of the threat of disease (which will put an end to their lifestyle anyway) is that they should take up yoga and meditation. In this way they will minimize the harmful effects of stress and can live more relaxed and fuller lives.

Possible consequences

The main danger of having hypertension is not the fact that the blood pressure itself is raised, but the harmful consequences of raised blood pressure. There are many things which can go wrong as the blood vessels feed into every organ of the body. When they are constricted, preventing the inflow of blood and thus the distribution of oxygen and removal of wastes, tissue damage occurs. This prevents the organs from functioning. In the case of the brain, heart, kidneys, etc., this is lethal. Some manifestations are:

• Heart disease : The heart, as it becomes more and more strained, increases in size, damaging its internal

components such as the valves, and thus impairing total function. The heart also becomes more prone to heart attack (death of part of a muscle) as high blood pressure is associated with hardening of the arteries

• The brain: Oxygen supply to the brain is reduced so that it cannot function at optimum level. At first this may result in headaches, dizziness and a feeling of the world spinning (vertigo). Later, emotional imbalance and deterioration of concentration and memory occur followed by more serious complications of organic brain deterioration (encephalopathy), rupture of arteries (stroke) leading to paralysis and death.

• The eyes: Blurring of vision, sudden or progressive loss of vision may result. There can also be doubling of the vision (diplopia) or other defects.

• Kidneys: Dysfunction occurs which may result in the inability to produce urine. This allows the toxins of the body to build up and death can result.

• Malignant hypertension: A serious form of the disease. The blood pressure may rise to astronomical heights and death approaches rapidly.

The consequences of hypertension are unpleasant. Knowing the possibilities can help you to find a successful method of cure. One can avoid these complications before they start by applying yoga to the present regime of treatment. By relaxing body and mind, yoga allows the blood vessels to relax, ensuring a good supply of blood, oxygen and nutrition to the tissues. This, enhanced by the increased flow of Prana, will feed the tissues and aid in the process of regeneration and rejuvenation.

Yoga Therapy - Practice Program

Probably the best and most effective program for people suffering from high blood pressure is Pawanmuktasana part 1. Nadi Shodhana part 2. Bhramari Pranayama, Ajapa Japa and Yoga Nidra. This is especially useful in the more severe forms of hypertension and when there are complications such as heart disease and so on. Occassionally, even Pawanmuktasana has modified by removing dynamic spiritual twist and crow walking exercises due to the effort and strain imposed.

Yoga aims to remove hypertension and its potentially lethal effects through a system of Asanas (poses), Pranayama (breathing exercises) and Meditation, along with a complete reappraisal of lifestyle. Yoga leads to building up physical resistance, emotional harmony and Pranic balance through the eradication of the root cause in the mind. Asanas and Pranayama help in this process of self-healing. Yoga helps to cure hypertension by offering the following practices: Relaxation, Asana and Pranayama, Meditation and Kundalini Kriyas.

Diet

Diet plays a major role in the alleviation of hypertension. Medical and yogic treatment will help bring down the blood pressure, but in order to maintain this one must revise the diet.

Eat

- Low salt: Add spices or herbs instead of salt to increase the flavor and taste (1500 mg /day for hypertensive patients while 2300mg/day for normal adults)
- Low fat: Instead of frying, all food should consumed raw, grilled, baked or steamed
- Eat at regular times and in small quantities
- Eat more fruits, vegetables, nuts and low-fat dairy foods.

Avoid

- Salt, such as tinned, cured and bottled meats, foods with preservatives
- Bicarbonate of soda such as in biscuits and cakes
- Excess fat: fried foods, butter, fatty meat etc.

Eat in a relaxed and comfortable atmosphere, with good companions, the flavor and the Pranic content is increased even more. Rushing an inadequate meal only serves to increase sympathetic stimulation further. By relaxing, however, we turn on the parasympathetic component, the digestive juices are balanced and awareness is heightened, which automatically turn down the sympathetic overstimulation and lower the blood pressure.

Laghoo Shankhaprakshalana (LSP) (short intestinal wash)
The procedure of Laghu Shankha Prakshalana is to be performed as given below:

Drink two glasses of warm salty water as quickly as possible.
Perform the following five Asanas dynamically, eight times each in the correct sequence

Tadasana
Tiryaka Tadasana
Kati Chakrasana.
Tiryaka Bhujangasana
Udarakarshanasana
Drink two more glasses of water and repeat the Asanas eight times each.
Repeat the process for a third and last time,
Go to the toilet but do not strain whether there is a bowel movement or not.
If there is no motion, immediately it will come out later.

Additional practices: Kunjal Kriya and Jala Neti may be performed immediately after completing the practice
Time of practice: Laghoo Shankha Prakshalana (LSP) should be practiced in the morning when the stomach is completely empty, before any food or drink is taken.

Duration: Allow an hour for this practice

Frequency: Once a week is sufficient for general purposes. In cases of constipation, however it may be practiced daily until the condition improves.

Rest: On completion of the practice rest for half an hour before taking any food or drink.

Restrictions: There are no special food restrictions and no special food has to be taken following this practice.

Precautions: Do not try to force a bowel movement, it should be completely natural.

Contra-indications: People suffering from any medical condition should seek guidance from a qualified yoga teacher before attempting Laghoo Shankha Prakshalana, especially those taking medication. This practice should also be avoided during pregnancy.

Benefits: Whereas the full method completely empties and cleans the whole digestive system, the Laghoo Shankha Prakshalana (LSP) is intended to encourage normal functioning of the intestines. It is an excellent yet simple method of encouraging good bowel movement. It is highly recommended for those with digestive disorders such as constipation, flatulence, acidity, indigestion and other digestive upsets. It helps prevent urinary infections and the formation of kidney stones and is being used in many yoga therapy situations.

THE IMPORTANCE OF ENTERIC NERVOUS SYSTEM:
Our gastrointestinal system contains a "Second Brain", within its so called "Enteric Nervous System". It consists of sheaths of neurons embedded in the walls of the long tube of our alimentary canal, which measures about nine meters from the mouth to the anus. The second brain contains some 100 million neurons, more

than in either the spinal cord or the peripheral nervous system. This multitude of neurons in the enteric nervous system enables us to "feel" the inner world of our gut and its contents. They autonomously are capable of handling the process of digestion & absorption of food and excretion of waste. Dr. Emeran Mayer, Professor of Physiology, Psychiatry and Bio-behavioral Sciences at the David Geffen School of Medicine at the University of California, Los Angeles (UCLA) says that, "the system is way too complicated to have evolved only to make sure things move out of your colon"!. The scientists were surprised to learn that about 90 percent of the fibers in the primary visceral nerve, the Vagus, carry information from the gut to the brain and not the other way round. The second brain informs our state of mind in other more obscure ways, as well. "A big part of our emotions are probably influenced by the nerves in our gut" says Dr. Emeran Mayer. The signaling in the gut as part of our physiological stress response is one example. Gastrointestinal disorder can sour one's emotions and moods. Everyday emotional well-being may rely on messages from the Enteric Nervous System to the brain above. The Enteric Nervous System uses more than 30 neurotransmitters, just like the brain, and in fact 95 percent of the body's serotonin is found in the bowels. That is why, medicines meant to cause chemical changes in the mind often provoke gastrointestinal issues as a side effect. Irritable Bowel Syndrome also arises in part from neurotransmitter disorders in the gastrointestinal system, and therefore, regarded by many scientists as a "mental illness" of the second brain.

Scientific evidences are plenty and emerging more rapidly than ever before that the neurotransmitters made by the Enteric Nervous System might also play a role in more surprising diseases – osteoporosis, autism etc., Scientists are investigating on how the trillions of bacteria in the gut " communicate" with the Enteric Nervous System cells. Scientific research is exploring how the second brain mediates the body's immune response; after all, at least 70 percent of our immune system is aimed at the gut to expel and kill invading germs. The above evidences induce our belief that Laghoo Shankha Prakshalana may be useful yoga therapy for hypertension and many other disorders in which neurotransmitter dysfunctions and emotional tensions are considered to play a causal role.

Aims and Objectives:

To establish the ideal sample size and safety profile of Laghoo Shankha Prakshalana (LSP) among Hypertension patients and general public and to enable future conduct of a detailed study on the beneficial effects of Laghoo Shankha Prakshalana (LSP) on Blood pressure among BP patients and general public at Shiv Dharshan Yoga Vidyalaya.

Materials and methods:

The volunteers were selected randomly from different cross section of people both males and females, age ranging between 30-60 years for 40 days integrated Yoga Program. Initial medical assessments of the participants were done by Dr.P. Selvam Pandian and Dr.A.K. Ethirajan. The volunteers who had associated problems like heart problem, severe uncontrolled blood pressure, kidney disorders, liver disorders, gastrointestinal diseases, infective diseases, psychiatric disorders, severe musculoskeletal disorders were excluded. The participants subsequently underwent the integrated yoga practices. The volunteers were provided with the health information about blood pressure, hypertension and general health awareness. They were also explained in detail about the Laghoo Shankha Prakshalana procedure. The health status and profile of the volunteers

were recorded in the proforma (Annexure 1). Informed voluntary consent of the volunteers was taken in the consent form (Annexure 2). The salty water preparation for the Laghoo Shankha Prakshalana procedure: 2 teaspoons (9 grams) of salt per liter of lukewarm clean drinking water, so that it tastes mildly salty.

The procedure was started on the scheduled Saturday morning 6 am, when the stomach was completely empty, before any food or drink was taken. The participants' baseline vital parameters were recorded viz., body weight, and pulse rate, blood pressure (systolic and diastolic) in sitting posture in their right arm using mercury sphygmomanometer (Diamond Deluxe model apparatus). The participants were divided into two groups: Study group (20 numbers) and the Control group (20 numbers). The study group subjects performed the Laghoo Shankha Prakshalana procedure and the control group subjects rested during the study period.

The study group subjects continued the Laghoo Shankha Prakshalana procedure under supervision of the trainer with the following instructions:
Drink two glasses of lukewarm salty water as quickly as possible.
Perform the following five Asanas dynamically, eight times each in the correct sequence

Tadasana
Tiryaka Tadasana
Kati Chakrasana.
Tiryaka Bhujangasana
Udarakarshanasana
Drink two more glasses of salty water and repeat the Asanas eight times each.
Repeat the process for a third and last time,
Go to the toilet but do not strain whether there is a bowel movement or not. If there is no motion, immediately it will come out later.
The participants were advised to stop if any significant discomfort was felt. All the participants successfully completed the procedure. Duration of the procedure was one hour. On completion of the practice, all the participants were rested for half an hour before taking any food or drink.

At the end of the procedure, once again the above vital parameters viz., body weight, pulse rate, blood pressure (systolic and diastolic) in sitting posture in their right arm using mercury sphygmomanometer (Diamond Deluxe model apparatus) 15 minutes after the completion of the Laghoo Shankha Prakshalana procedure. The same parameters were recorded in the similar manner in all the volunteers in both the study and the control groups one week later. The volunteers were asked about their remarks and feedback on any discomfort or symptom after the Laghoo Shankha Prakshalana.

Swami Gambhirananda and staff of Shiv Dharshan Yoga Vidhyalaya monitored and assisted the participants during the procedures. D. Jayalakshmi processed the data of pre and post study results in computer.

Results:

STUDY GROUP:

	NAME	No of Glass	Pre Existing Illness	SEX	AGE	BEFORE KRIYA BP (mm Hg) {19-10-19}	AFTER KRIYA BP(mm Hg) {19-10-19}	BP(mm Hg) {26-10-2019}
1	SBP1	14		M	39	120/080	114/088	110/070
2	SBP2	14		M	33	120/080	112/076	110/080
3	SBP3	14		F	37	110/070	140/080	100/070
4	SBP4	12		M	49	110/090	130/090	120/100
5	SBP5	14		F	49	110/090	120/088	110/064
6	SBP6	16		F	34	120/080	110/070	114/080
7	SBP7	14		F	54	140/090	180/090	140/080
8	SBP8	10		M	52	110/080	110/070	110/070
9	SBP9	12		M	29	110/070	110/070	110/070
10	SBP10	14		M	44	130/090	130/094	130/090
11	SBP11	14		F	29	130/088	130/090	130/070
12	SBP12	12	HYPERTENSION	M	49	130/100	140/090	140/080
13	SBP13	14		F	32	110/070	100/066	100/060
14	SBP14	16		M	58	130/090	130/088	130/084
15	SBP15	14		F	37	100/060	110/090	090/070
16	SBP16	16		F	38	110/070	114/070	090/060
17	SBP17	12		M	29	120/080	110/070	120/070
18	SBP18	14		M	59	100/070	100/060	100/060
19	SBP19	14		F	52	110/090	130/090	110/070
20	SBP20	16		M	46	126/084	126/088	120/078

CONTROL GROUP:

SI NO	NAME	SEX	AGE	BEFORE KRIYA BP (mm Hg) {19-10-2019}	BP (mm Hg) {26-10-2019}
1	CBP1	M	43	120/080	120/80
2	CBP2	F	44	110/080	130/90
3	CBP3	F	22	110/070	090/70
4	CBP4	F	40	090/070	110/70
5	CBP5	M	51	107/069	110/70
6	CBP6	F	41	100/060	084/70
7	CBP7	M	33	120/086	116/74
8	CBP8	F	46	120/080	102/70
9	CBP9	M	60	150/088	130/80
10	CBP10	M	59	140/090	144/80
11	CBP11	M	19	111/064	100/64
12	CBP12	M	46	130/100	114/74
13	CBP13	F	30	100/080	130/80
14	CBP14	F	28	120/080	122/80
15	CBP15	F	40	107/067	110/70
16	CBP16	F	42	130/090	120/90
17	CBP17	F	42	130/080	110/64
18	CBP18	F	42	090/080	120/76
19	CBP19	F	32	120/080	110/70
20	CBP20	F	23	116/080	110/60

Discussion:

While the Laghoo Shankha Prakshalana (LSP) was conducted, all the subjects were comfortable and felt healthy during and after the study.

Conclusions:

1. Systolic blood pressure: No significant difference between study and control groups.
2. Diastolic blood pressure: No significant difference between study and control groups.
3. All the study subjects felt comfortable and felt better during and after the study.

Limitations of the study:

Study protocol on human subjects needs to be approved by registered ethical committee and submitted to the National Research Registry.

Sample size was too small and the power of the study is statistically weak.

No randomization of the subjects was done.

Confounding factors are not matched amongst the subjects: comorbidities are not listed in the inclusion and exclusion criteria of the subjects

During the pilot study, every opportunity was fully utilized to provide health education and create awareness among all the participants, volunteers and also their family members and friends about the chronic diseases and disorders like hypertension, diabetes mellitus, and chronic inflammatory disorders and also the positive health benefits and improvements of Yoga Therapy.

Summary:

This pilot study suggests that the Laghoo Shankha Prakshalana (LSP) is a safe, effective and simple Yoga Kriya that can be practiced by one and all. Therefore, it is essential to conduct further scientific research for proof of the beneficial effects of Laghoo Shankha Prakshalana (LSP) in the prevention and control of chronic and serious diseases and disorders like Hypertension, Diabetes Mellitus and other Chronic Inflammatory Disorders and the related complications. Laghoo Shankha Prakshalana (LSP) and other Yoga Therapy practices are cost effective and universally applicable for the general population. Hence, this pilot study strongly indicates the need for conducting further research and scientific studies for obtaining valuable information about the health benefits of Laghoo Shankha Prakshalana (LSP).

Bibliography:

1. Anshuman naik, da biswas, shashikala patel. Effect of left Nostril breathing in hypertensives. *J indian academy clin med* 2012;13(1):
2. Bernardo rodriguez-iturbe, hector pons, and richard j. Johnson. Role of the immune system in hypertension. *Physiol Rev* 2017;97(3):1127–64.
3. Raghupathy anchala, nanda k. Kannuri, hira pant, Hassan Khan, oscar h. Franco, emanuele di angelantonio And dorairaj prabhakarand. Hypertension in india: a Systematic review and meta-analysis of prevalence, awareness, And control of hypertension. *J hypertens* 2014;32(6):1170-7.
4. Ranjana ganpat tryambake. The effectiveness of pranayama On blood pressure of hypertensive patients, *int j sci res (ijsr)* 2015;4(8):
5. Ananda balayogi bhavanani, zeena sanjay, and madanmohan. Immediate effect of sukha pranayama on cardiovascular Variables in patients of hypertension, *int j yoga therapy* 2011;21(1):73-6.
6. Ananda balayogi bhavanani, madanmohan,1 and zeena Sanjay. Immediate effect of chandra nadi pranayama (left Unilateral forced nostril breathing) on cardiovascular Parameters in hypertensive patients. *Int j yoga* 2012;5(2):108– 11.
7. Saraswati sn. Prana, pranayama, prana vidya. Yoga Publications trust; 1994.

8. Veerabhadrappa sg, herur a, patil s, et al. Effect of yogic Bellows on cardiovascular autonomic reactivity. *J cardiovasc Dis res* 2011;2(4):223-7.
9. Roopa b.a., anita, herur., shailaja patil., shashikala gv, Surekharani chinagudi. Effect of short-term pranayama and Meditation on cardiovascular functions in healthy Individuals. *Heart views* 2011;12(2):58–62.
10. Telles s, naveen k, dash m. Yoga reduces symptoms of Distress in tsunami survivors in the andaman islands. Evid. *Based complement altern med* 2007;4(4):503-9.
11. Kuppusamy m, kamaldeen d, pitani r, amaldas j, Shanmugam p. Effects of bhramari pranayama on health e a Systematic review. *J tradit complement med* 2018;(8):11-16.
12. Ramesh chand yadav. Effect of twelve week selected Pranayama practices in primary high blood pressure patients. *Ejpmr*, 2016;3(6):471-4.
13. T pramanik, b pudasaini and r prajapati. Immediate effect of A slow pace breathing exercise bhramari pranayama on blood Pressure and heart rate. *Nepal med coll j* 2010;12(3):154-7
14. Ashish chadda. Breathing slower to live longer. *J indian College cardiol* 2015;(5):183 -8.
15. Rajni goyal, hem lata,1 lily walia, and manjit k narula. Effect of pranayama on rate pressure product in mild Hypertensives. *Int j appl basic med res* 2014;4(2): 67–71.
16. Effects of yoga on hypertension by dr,swami karmanand saraswati under the guidance of swami satyananda saraswati, bihar school of yoga, munger.
17. Hatha yoga pradipika by swami mukthi bodhanand saraswati under the guidance of swami satyananda saraswati, bihar school of yoga, munger.
18. Asana pranayama mudra bandha by paramhamsa swami satyananda saraswati, bihar school of yoga, munger.
19. Prana and pranayama by paramhamsa swami niranjanananda saraswati, bihar school of yoga, munger.

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