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Yogic Management of Human Cardiovascular Disorders

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Abstract: This research paper explores the rising prevalence of cardiovascular diseases (CVDs) and examines the efficiency of Yogic practices in the prevention and management of these disorders. The paper emphasizes that while medical interventions exist but the prevention through yogic discipline is ideal for holistic cardiovascular health. This paper explores the physiological and therapeutic benefits of Yoga in improving cardiovascular function, reducing risk factors such as hypertension and promoting overall well-being. By integrating traditional Yogic practices with modern scientific evidence, this study underscores the effectiveness of Yoga as a complementary intervention for cardiovascular health management.

Keywords: *Cardiovascular disorders, Ashatanagayoga, Hathayoga, Shatakarma, Yogasana, Pranayama, Dhayan, GABA.*

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I. INTRODUCTION

Cardiovascular diseases are the ailments related to the Cardiovascular system. These are also called as CVDs. In present time Cardiovascular disorders are becoming leading cause of morbidity and mortality worldwide and have become serious problem globally. Unorganized life style, food habits, dependency upon machinery, seeking for comfort, misuse of medications have led into increased cases of cardiovascular disorders in large amount. Due to which cardiovascular disorders are becoming leading cause of morbidity and mortality worldwide. Apart from medications, Yogic practices e.g. Shodhan-kriyas, Yogasana, Pranayama and Dhayana etc. can be a powerful medium for better health of Cardiovascular system through which disorders related to this system can be prevented.

II. HUMAN CARDIOVASCULAR SYSTEM

This is also known as circulatory system which consists of;

A. Human Heart.

B. Blood Vessels (Arteries & Veins).

A. Human Heart:

Human heart is an important organ which is made up of cardiac muscles and plays an important role in the ***Cardiovascular system*** of the human body. It is pear shaped and fist like in size. It is located at thorax cavity between two lungs slightly towards left side of sternum. It is four chambered containing two atria and two ventricles. It works like a pumping machine which pump the blood to each and every cell of body through continuous muscular contraction and relaxation. Human heart functions through ***Cardiac conduction system*** which contains S-A node (Sino-auricular node/ Pacemaker), A-V node (Atrio-ventricular node), Bundle of His and Purkinje fibers and is regulated by autonomic nervous system.

B. Blood Vessels:

These are blood carrying pipe like structures which interconnect the whole body to the heart. These are of two types:

- **Arteries:** These carry the oxygenated blood from heart to the body parts. But, the *Pulmonary Artery* connects the heart to the lungs and carries deoxygenated blood.
- **Veins:** Veins carry the deoxygenated blood from all the parts of the body to the heart. These are divided in to two parts i.e. *Superior vena cava* which collects the blood from the upper region of the body and *Inferior vena cava* which collects the blood from the lower groin of the body to the heart. But the *Pulmonary Vein* carries the oxygenated blood and connects the lung to the heart.

Exchange of the gases i.e. Oxygen & Carbon-di-oxide occurs in the lungs where Co_2 is expelled out of the body and O_2 get mixed with the blood and becomes Oxyhemoglobin. Oxygen travels in the whole body in the form of Oxyhemoglobin through arteries. When the heart & the blood vessels are not able to function properly due to various causes and factors then this condition results in to the occurrence of

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various disorders which are known as Cardiovascular disorders.

- **Cardiovascular Disorders:** Cardiovascular Disorders (CVDs) are group of diseases of heart and blood vessels. Common CVDs are as follows:

- **IHD:** Ischemic Heart Disease is also known as ***coronary artery disease (CAD), coronary heart disease (CHD)*** *&* ***Myocardial Ischemia***. It is the most common cardiovascular disorder in which the arteries known as coronary arteries are not able to deliver enough oxygenated blood to the heart muscle due to narrowing from the buildup of fatty substances called *Plaque*. Due to which coronary arteries become narrow and fails to supply required amount of blood to the heart and heart muscles become weak.[1]

- **Causes:** Main causes of CAD are as follows:

✓ Blood fat is the main cause of the CADs which gets accumulated in the wall of coronary arteries due to poor metabolism, lack of physical activity.[2]
✓ Air pollution and smoking are also causes of the CADs.[3]
✓ **Genetics:** The heritability is also responsible for the CAD. The Genome wide association has found out genetics also as a cause of the coronary artery disease.[4]

- Symptoms:

✓ Chest pain which is also known as *Angina pectoris.*[5]
✓ Numbness in the face, arm or leg, especially on left side of the body.[5]
✓ Pain or discomfort in the center of the chest.[5]
✓ Pain or discomfort in the arms, the left shoulder, elbows, jaw, or back.[5]

- **Diagnosis:** Diagnosis of CADs can be done through *Electrocardiogram (ECG)*. *X-ray* of the chest, blood tests and *Echocardiography*, *Intravascular ultrasound, MRI (Magnetic Resonance Imaging)* can also be done for this purpose.[6]

- **Risk factors:** CAD has several well-determined risk factors which include smoking, hypertension, high amount of cholesterol and other fat in the blood, type 2 diabetes, obesity due to lack of exercise and a poor diet, smoking, lack of exercise, stress, anxiety, depression, family history, and excessive alcohol consumption. The people suffering from these things have high risk of the CAD.[7]

- **Cerebrovascular Disease**: This includes a variety of medical conditions affecting the blood vessels of the brain and the cerebral circulation. Cerebral arteries supplying oxygen and nutrients to the brain from the heart are often damaged or deformed in this disorder, which results in the ischemic stroke and hemorrhagic stroke.[8]

- **Causes:** The main causes of the cerebrovascular disease are as follows:

✓ The main cause of the cerebrovascular disease is the accumulation of fats upon the inner side of walls of the cerebral arteries due to which they become narrow and the blood supply to the brain from the heart is not in a proper manner.[8]
✓ Congenital diseases like arteriovenous malformations, germinal matrix hemorrhage etc. also result in cerebrovascular disease.[9]
✓ Unhealthy life style, food habits etc. are also the causes of such diseases.

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[5] Wong ND (May 2014). "Epidemiological studies of CHD and the evolution of preventive cardiology". *Nature Reviews. Cardiology*. 11 (5): 276–89. doi:10.1038/nrcardio.2014.26. PMID 24663092. S2CID 9327889
[6] Knuuti J, Wijns W, Saraste A, Capodanno D, Barbato E, Funck-Brentano C, Prescott E, Storey RF, Deaton C, Cuisset T, Agewall S, Dickstein K, Edvardsen T, Escaned J, Gersh BJ (31 August 2019). "2019 ESC Guidelines for the diagnosis and management of chronic coronary syndromes". *European Heart Journal*. 41 (3): 407–77.
[7] Mendis S, Puska P, Norrving B, eds. (2011). *Global atlas on cardiovascular disease prevention and control*. World Health Organization. pp. 3–18. hdl:10665/44701. ISBN 978-92-4-156437-3.
[8] Portegies, M.L.P; Koudstaal, P.J; Ikram, M.A (2016). "Cerebrovascular disease". *Neuroepidemiology*. Handbook of Clinical Neurology. Vol. 138. pp. 239–261. doi:10.1016/b978-0-12-802973-2.00014-8. ISBN 9780128029732. PMID 27637962.
[9] Townsend, Courtney M., Jr.; Beauchamp, R. Daniel; Evers, B. Mark; Mattox, Kenneth L. (20th ed.). Philadelphia, PA: Elsevier. 2017. abiston textbook of surgery: the biological basis of modern surgical practice pp. 1900–1937. ISBN 978-0323299879.

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- **Symptoms:** The basic symptoms of this disease are;

✓ The most common and characteristic symptom of cerebrovascular diseases is an acute stroke, which occurs when blood supply to the brain is disturbed.[8]
✓ Weakness of one side of the face or body, numbness on one side of the face or body, inability to produce or understand speech, vision changes, and balance difficulties.[8]
✓ Hemorrhagic strokes occur with a very severe & sudden headache, vomiting, neck stiffness and decreased consciousness.[8]

- **Diagnosis:** Diagnosis of the cerebrovascular disease is generally done through medical history examination, MRI scan of the brain and neurological examination.[10]
- **Risk factors:** People suffering from hypertension, diabetes, obesity, high cholesterol problem, low metabolism, respiratory disorders, arrhythmia are at high risk of this disease.[11]
- **Peripheral artery disease (PAD)**: Peripheral artery disease (PAD) is the narrowing of the arteries to the legs, stomach & arms due to the fat accumulation in the peripheral arteries.[12] This problem occurs majorly in the legs than the arms.
- **Causes:** The causes of this disease are as follows;

✓ It is characterized by development of lesions in walls of arteries due to highly elevated levels of cholesterol in the blood so that blood supply of oxygenated blood to the related part from the heart gets blocked.[12]
✓ Undisciplined life style, food habits, lack of physical activity etc. are also the causes of such diseases.

- **Symptoms:** Some common symptoms of this disease are as follows:[13]

✓ Pain, aches or cramps in the buttocks, hip or thigh.
✓ Muscular atrophy of the affected limb.
✓ Skin which is smooth, shiny, or cool to the touch in the affected area.
✓ Decreased or absent pulse in the feet.
✓ Numbness and coldness in the toes.
✓ Sores or ulcers on the affected limb which do not heal.

- **Diagnosis:** Diagnosis can be done through ABI (Ankle-Brachial Index) Test, CT scan and MRA (Magnetic Resonance Angiography.[14]

- **Risk factors:** Risk factors PAD is smoking, high cholesterol, high blood sugar, hypertension, Dyslipidemia.[15]

- **Heart Attack:** It is that condition when blood flow decreases or stops in one of the coronary arteries of the heart, causing infarction (tissue death) to the heart muscle. It is also known as MI (Myocardial infarction).

- **Causes:** The main cause of this condition is CAD due to which flood flow is decreased to the heart.

- **Symptoms:** Symptoms of the heart attack are retrosternal chest pain or discomfort that radiates to the left shoulder, arm or jaw, shortness of breath, nausea, feeling faint, cold sweat, feeling tired, and decreased level of consciousness.[16]

- **Diagnosis:** Diagnosis can be done through chest X-rays on the basis of symptoms, ECG, Echocardiography & Myocardial perfusion imaging.[17]

- **Risk factors:** Risk factors of the heart attack are same as of CAD, which include smoking, hypertension, high amount of cholesterol and other fat in the blood, type 2 diabetes, obesity due to lack of exercise and a poor diet, smoking, lack of exercise, stress, anxiety, depression, family history, and excessive alcohol consumption.

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✓ **Cardiac Arrest:** Cardiac arrest is commonly referred as sudden cardiac arrest (SCA). It occurs when the heart stops beating abruptly. The brain and other organs receive less blood when the heart stops pumping because blood cannot move through the body normally. A person may lose consciousness and brain cells may begin to die from a lack of oxygen.[18]

- **Causes:** Coronary artery disease (CAD) is the main cause of the Cardiac arrest and the other causes which are responsible for the CAD are also responsible for the cardiac arrest. Other causes are congenital heart defect, major blood loss, lack of oxygen & respiratory diseases etc.

- **Symptoms:** Cardiac arrest occurs without any warning symptoms in around 50% of persons. But some of the symptoms include new or increasing chest pain, exhaustion, blackouts, dizziness, shortness of breath, weakness, or vomiting.[19]

- **Diagnosis:** These techniques can be used to diagnose cardiac arrest: ECG and finding no pulse.[18]

- **Risk factors:** Cigarette smoking, high blood pressure, high cholesterol, arrhythmia history, lack of physical activity, obesity, diabetes, family history, cardiomyopathy, alcoholism, and possibly caffeine consumption are all risk factors.[20]

✓ **Heart Failure:** It is also known as congestive heart failure (CHF). It is the malfunction in the heart's capacity to fill with and pump the blood to the different parts of the body.[21]

- **Causes:** Heart failure is mostly caused by heart attacks, high blood pressure, irregular cardiac rhythms, heavy alcohol usage, infections, and heart injury. [22]
- **Symptoms:** Some common symptoms are shortness of breath, tiredness or exhaustion & swollen legs.[23]
- **Diagnosis:** It can be diagnosed through Echocardiogram which is also called as ultrasound of the heart.[24]
- **Risk factors:** The major risk factors of the heart failure are obesity, smoking, physical inactivity, undisciplined life style, respiratory disorders etc.[24]

So, it can be said that Cardiovascular disorders occur mainly due to malfunctioning of the heart and the blood vessels. There are many causes like undisciplined life style, food habits, smoking, alcohol consumption, respiratory diseases, pollution, stress, depression etc. causing CVDs in present time. The main reason behind the CVDs is the blockage in the blood vessels due to accumulation of the fat specifically LDL (Low Density Lipoprotein), which results in the low supply of the blood, nutrition and oxygen to the heart. Also, secretion of the stress hormones due to stress and sudden stressful conditions also causes break in the rhythm of the heart. Due to which malfunctioning of the heart increases and it fails to supply appropriate amount of oxygenated blood along with nutrition to the other body parts like brain. forelimbs, hindlimbs etc. which results in the occurrence of the various CVDs. These can be diagnosed through various techniques and methods like ECG, Echocardiogram, MRI scan & CT scan etc. Through surgery and medications treatment of these diseases is possible. But the prevention is better than cure which can be done through practicing Yoga asanas, Shodhan kriyas, Pranayama and meditation.

III. EFFECT OF THE YOGIC PRACTICES ON CARDIOVASCULAR DISORDERS

The main reason of CVDs is blockage in the blood vessels due to which functioning of the heart is reduced because of lack of oxygen supply to the heart. But there are many Yogic practices which can improve functioning of the heart and the blood vessels. These are mentioned in the scriptures & text books of Yoga e.g. *Hathapradeepika, Gheranda Samhita, Hatharatnavali* etc. which are as follows:

- **Shatakarama** These are the purification techniques mentioned in the scriptures of Hathayoga like Hathapradeepika & Gheranda Samhita to cleanse the body and to purify the *Nadis* which carries the life force i.e.

[18] Field JM (2009). *The Textbook of Emergency Cardiovascular Care and CPR*. Lippincott Williams & Wilkins. p.11. ISBN 9780781788991.
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Prana to the each and every cell of the body. These are six in number, hence known as ***Shatakarama***.

✓ **Shatakarama mentioned in Hathapradeepika:** Hathapradeepika is an important scripture of Hathayoga written by Swami Swatmarama ji. It is divided in to four chapters (Upadeshas) explaining the four anga i.e. limbs of Yoga i.e. Asana, Pranayama, Mudra & Nadanusandhana. There are six types of Shodhana Kriyas mentioned in the 2nd chapter (Upadesha) of the text. These are as follows;

धौतिर्बस्तिस्तथा नेतिस्त्राटकं नौलिकं तथा।
कपालभातिश्चैतानि षट्कर्माणि प्रचक्षते ।।[25]

Meaning: Dhauti, Basti, Neti, Trataka, Nauli & Kapalbhati are the six cleansing methods.

Different types of shatakarama mentioned in this text are shown in the table no.01

Table 1: Shatakarma Mentioned in Hathapradeepika

Sr. No.	Dhauti	Basti	Neti	Trataka	Nauli	Kapalabhati
1.	Vastra Dhauti	Jala Basti. (It should be performed in Utkatasana.)	Sutra Neti	Staring at any point without blinking the eyes. None specific type is mentioned.	Moving the abdominal muscles from right side to left and left to right side frequently.	Only one type. (through air only)

Source: Digambarji swami, Jha Pitambar (2017), Hathapradeepika, Kaivalyadhama Lonavala, ISBN-978-818-948-5122.

✓ **Shatakarama mentioned in the Gheranda Samhita:** Gheranda Samhita is also a very important text of Hathayoga which is related to the Vaishanav tradition of Yoga. It is in the form of communication between Maharishi Gheranda & his disciple Chandakapali. This scripture mentions 7 limbs of Yoga which is known as Saptanga Yoga i.e. Shatakarma, Asana, Mudra, Pratyahara, Pranayama, Dhayana & Samadhi. and talks about Ghatasatha Yoga. Shatakarma is the first limb of the Ghatasatha Yoga which is mentioned in the 1st upadesha as follows:

धौतिर्बस्तिस्तथा नेतिः लौलिकी त्राटकं तथा।
कपालभातिश्चैतानि षट्कर्माणि समाचरेत् ।।[26]

Meaning: It means that Dhauti, Basti, Neti, Lauliki, Trataka & Kapalabhati are the shatakarma.

There are 4 types of dhauti (which is having other sub-types too), 2 types of basti, one type of neti, three types of kapalabhati mentioned in the Gheranda Samhita.

These are shown in the table no.02 which is made up on the basis of shatakarama mentioned in the Gheranda Samhita.

Table 2: Shatakarma Mentioned in Gheranda Samhita

Sr. No.	Dhauti	Basti	Neti	Lauliki	Trataka	Kapalabhati
1.	Antar-Dhauti: Vatasara, Varisara, Vahnisara, Bahishkrit Dhauti.	Jala Basti: It should be performed in Utkatasana.	Sutra Neti	Moving the abdominal muscles from right side to left and left to right side frequently	Staring at any point without blinking the eyes.	Vatakrama Kapalabhati.
2.	Danta Dhauti: Dantamula, Jihvamula, Karna- randhra-1&2, Kapala-randhra Dhauti.	Shushaka Basti: It is also known as Sthala Basti which is perfomed in paschimotta-nasana.	-	-	-	Vyutakrama Kapalabhati.
3.	Hrid Dhauti: Danda dhauti, Vamana Dhauti, Vastra Dhauti.	-	-	-	-	Sheetakrama Kapalabhati.
4.	Moola Shodhana.	-	-	-	-	-

Source: Sahay Gyanashankar (2023), Gheranda Samhita, Chaukhamba Surbharti Prakashan, ISBN-978-93-94829-48-0.

[25] Digambarji swami, Jha Pitambar (2017), Hathapradeepika, Kaivalyadhama Lonavala, 2.22, page no.45, ISBN-978-818-948-5122.

[26] Sahay Gyanashankar (2023), Gheranda Samhita, Chaukhamba Surbharti Prakashan, 1.12, page no.9, ISBN-978-93-94829-48-0.

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- ✓ **Yogic management of cardiovascular diseases through Shatakarama:** The main cause of the CVDs is blockage in the blood vessels due to accumulation of the fat on their walls. Obesity, high cholesterol level etc. are the main reasons behind this. From the Yogic perspective this happens due to the Kapha dosha enhancement in the form of vikriti. So, the Shatakarma can be efficient medium to get rid off obesity, fatty body as the Hathapradeepika says that;

मेदः श्लेष्माधिकः पूर्वं षट्कर्माणि समाचरेत् ।
अन्यस्तु नाचरेत्तानि दोषाणां समभावतः।।[27]

Meaning: It means that the people suffering from obesity, Kapha dosha enhancement and having fat in large amount in the body should practice the Shatakarama.

So, it is clear from the above statement that Shatakarma play an important role in removing the extra fat from the body.

Vastra dhauti among the shatakarama is a very efficient tool for balancing kapha dosha as mentiomed in the Hathapradeepika as follows;

कासश्वासप्लीहकुष्टं कफरोगाश्च विंशतिः।
धौतिकर्मप्रभावेन प्रयान्तयेव न संशयः ।।[28]

Meaning: By practicising Vastra dhauti cough, respiratory disorders, spleen related disorders and 20 types of diseases caused by Kapha dosha can be cured.

In Gheranda Samhita efficiency of the Danda dhauti is explained over the heart related diseases as follows;

कफं पित्तं तथा क्लेदं रेचयेदूर्ध्ववर्त्मना।
दण्डधौतिविधानेन हृद्रोगं नाशयेद् ध्रुवम् II[29]

Meaning: It means that through the practice of Danda dhauti Kapha, Pitta and mucous get removed from the body through mouth. It also helps in curing the hearty related disorders.

Hence, it can be said that by practicing shatakarama specifically Danda dhauti & Vastra dhauti are highly efficient in the heart related disorders as they help in cleansing the respiratory track and upper digestive track by removing the toxins, excessive Kapha & Pitta through mouth. So, excessive fats from the body gets reduced. As a result of which blood vessels become clean and supply of the blood and oxygen through them becomes smooth in a regular manner. So, the threat of the cardiovascular disorders gets reduced.

- ✓ **Asana**: In the Sadhana Pada of the PatanjalYogasutra of Maharishi Patanjali ji *Asana* is described as 3rd limb of ***AsatangaYoga***, which is defined as;

स्थिरसुखमासनम् ।।[30]

Meaning: It means that remaining in a steady and comfort position is called asana.

- ✓ Yogic management of cardiovascular diseases through Yogasana:

The common benefit of practicing asana is also mentioned in another sutra as;

ततो द्वन्द्वानभिघातः।।[31]

Meaning: It means that through the practice of asana *Dwanda* (i.e. hot & cold, urge of thirst & hunger, happiness & sorrow) can't affect a person.

Due to which the practitioner of Yogasana not only becomes physical strong & flexible, but stability, flexibility and strength comes to his mind too. Acceptance and tolerance towards difficult situations also get enhanced. As a result of which endocrine system & nervous system remain calm and relaxed, therefore no extra pressure is applied to heart which is necessary to the health of the heart.

Specific number of asanas is not mentioned in the Yogasutra of Maharishi Patanjali. But the various asanas are explained in different texts of Hathayoga. E.g. there are 32 asanas mentioned in the Gheranda Samhita, 15 in Hathapradeepika and 84 in Hatharatanavali. Hathapradeepika considers asana as the first limb of Yoga and Gheranda Samhita as 2nd limb. Practicing various asanas help in improving blood circulation through the whole body. Due to which proper amount of oxygen and nutrition get supplied to the each and every cell of the body. But asana like Shavasana also helps in relaxing the body & mind by releasing the stress and fatigue.

[27] Digambarji swami, Jha Pitambar (2017), Hathapradeepika, Kaivalyadhama Lonavala,2.21, page no.44, ISBN-978-818-948-5122.

[28] Digambarji swami, Jha Pitambar (2017), Hathapradeepika, Kaivalyadhama Lonavala,2.25, page no.46, ISBN-978-818-948-5122.

[29] Sahay Gyanashankar (2023), Gheranda Samhita, Chaukhamba Surbharti Prakashan, 1.37, page no.27, ISBN-978-93-94829-48-0.

[30] Srivastavya Sureshchandra (2018), PatanjalaYogadarshana, Chaukhamba Surbharati Prakashan,2.46, page no.297.

[31] Srivastavya Sureshchandra (2018), PatanjalaYogadarshana, Chaukhamba Surbharati Prakashan,2.48, page no.301.

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In Hathapradeepika it is mentioned that;

उत्तानं शववद्भूमौ शयनं तच्छवासनम् ।
शवासनं श्रान्तिहरं चित्तविश्रान्तिकारकम् ।।[32]

Meaning: Lying down on the ground like a dead body is known as Shavasana. It releases the tiredness and relaxes the mind and body.

In Gheranda Samhita this asana is known as both Mritasana & Shavasana which is described as follows;

उत्तानशववद् भूमौ शयनन्तु शवासनम् ।
शवासनम् श्रमहरं चित्तविश्रान्तिकारकम् ।।[33]

Meaning: It means that lying supine on the ground like a dead body is known as Shavasana. It removes fatigue and relaxes the mind.

Practicing other Yogasanas like Surya Namasakar etc. can also be beneficial in circulating the blood through whole body due to physical activity. Regular practice of Surya Namaskar can improve cardiorespiratory fitness, as well as promote weight management.[34] Hence, it can be said that Yogasanas not only improves the circulation of blood in the body but, also relaxes the mind and removes the fatigue. Due to which body cells rejuvenate again by getting proper rest, nutrition and oxygen. Flow of the Prana i.e. vital energy also enhances with the movements of body part during Yogasana practice.

✓ **Pranayama:** Pranayama is described as 4th limb of the ***Ashatanagayoga*** in Sadhana pada of the PatanjalaYogasutra of Maharishi Patanjali. It is defined as;

तस्मिन् सति श्वासप्रश्वासयोर्गतिविच्छेदः प्राणायामः ।।[35]

Meaning: It means that after asana siddhi a Yoga practitioner should break the flow of breathing which is called Pranayama.

Four types of Pranayama are mentioned in the Yogasutra of Maharishi Patanjali i.e. Bahyavritti (Rechaka), Abhyantaravritti (Puraka), Stambhavritti (Kumbhaka) & Bhayabhyantaravishayakshepi (Kewali).[36]

But in Hathayogic texts like Hathaptradeepika & Gheranda Samhita eight-2 types of Kumbhaka are described.

✓ Yogic management of cardiovascular diseases through Pranayama:

- **Nadi Shodhan:** Researches show the efficiency of the Nadi Shodhana over cardiovascular health as follows;

✓ Nadi Shodhana plays an important role in lowering the blood pressure and excessive heart rate through which risk of cardio vascular disorders can be reduced.[37]
✓ Nadi Shodhana helps in increasing parasympathetic activity and helps in reducing the heart rate and RR intervals, which prevents the extra pressure on the heart.[38]

- **Bharamari Pranayama:** Bharamari is a very beneficial pranayama which is mentioned in both Hathapradeepika & Gheranda Samhita. Researches show that Practice of Bhramari pranayama improves lung functioning and helps in decreasing the blood pressure and excessive heart rate.[39] Practicing Bharamari Pranayama reduces the stress and the sleep related disorders like insomnia by calming the mind which improves sleep quality and reduces cortisol levels, due to which stress gets released and endocrine system also relaxes.[40] Hence, it lowers the high

[32] Digambarji swami, Jha Pitambar (2017), Hathapradeepika, Kaivalyadhama Lonavala,1.32, page no.16, ISBN-978-818-948-5122.

[33] Digambarji swami, Gharote M.L. (2022), Gheranda Samhita, Kaivalyadhama Lonavala, 2.19, page no.59, ISBN-8190280333.

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[36] Srivastavya Sureshchandra (2018), PatanjalaYogadarshana, Chaukhamba Surbharati Prakashan, 2.51-52, page no.303,309.

[37] Dr.Manoranjan Tripathy, Bisweswari Sahu (2019) Immediate Effect of Nadi Shodhana Pranayama on Blood Glucose, Heart Rate and Blood Pressure, Journal of American Science.

[38] K. Saisupriya,Department of Yoga, SDM College of Naturopathy and Yogic Sciences, Ujire, Karnataka, India; Shashikiran H. Chandrappa, Division of Yoga and Physical Therapeutics,SDM College of Naturopathy and Yogic Sciences, Ujire, Karnataka, India ; Prashanth Shetty, Department of Natural Therapeutics, SDM College of Naturopathy and Yogic sciences, Ujjre, Karnataka, India; Thittamaranahalli Muguregowda Honnegowda, Centre of Excellence, Government of India, SDM College of Naturopathy and Yogic Sciences, Dakshina Kannada, Karnataka, India; Leena Hiremath, Department of Physiology, KS Hegde Medical College, Deralakatte, Mangaluru, Karnataka (2020), India, Analysis of immediate effect of nadishodhana pranayama in the ratio of 1:3:2 on autonomic and respiratory variables in healthy individuals,Yoga Mīmāṃsā.

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[40] Garg, Nisha; Panda, Srikanta Kumar (2024), Clinical Efficiency of Bharamari Pranayamaa on Serum Cortisol in Anidra (insomnia), Journal of Ayurveda,18(4): p261-266, DOI: 10.4103.

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blood pressure and heart rate. So, the threat of cardiovascular disorders becomes less.

- ✓ **Dhayana:** Dhayana is the 7th limb of the Ashatanagayoga mentioned in the PatanajalaYogasutra. According to Yogasutra of Maharishi Patanjali, Dhayana is defined as;

तत्र प्रत्ययैकतानता ध्यानम् ।।[41]

Meaning: It means that to remain focused at the subject of dharana without any break is called Dhayana.

In the scriptures of Hathayoga like Gheranda Samhita, Dhyana is also mentioned as the essential part of the SapatangaYoga. It is described as the 6th limb of Yoga and three types of Dhayana i.e. Sthula, Jyoti & Sukshama Dhayana[42] are described there.

- ✓ **Yogic management of cardiovascular diseases through Dhayana:** Researches show that practicing Dhayana is also impactful in reducing the cardiovascular disorders. A Research shows that practicing Dhyana can be helpful in reducing the stress & anxiety by releasing **GABA (Gamma Aminobutyric acid/ γ-Aminobutyric acid**). GABA is kind of natural tranquilizer produced by brain to help manage anxiety and stress response. Higher level of GABA means more relaxation, calmness and a feeling of pleasure. Regular practice of meditation, lagers the brain volume in areas of brain associated with regulating stress and self-awareness. It balances the endocrine system through the release of relaxing hormones, due to which activity of renal stress hormones get controlled and which reduces the unnecessary excitement. So, there is no unnecessary increase in heart beat and extra load on functioning of cardiovascular system.[43]

IV. CONCLUSION

The paper concludes that cardiovascular diseases (CVDs) are becoming increasingly common problem due to lifestyle factors such as unbalanced diet, lack of physical activity, stress, and pollution etc. While medical treatments are there, but prevention through holistic approaches like Yoga is emphasized as a feasible strategy. Yogic practices including Shatkarma (cleansing techniques), Asanas (postures), Pranayama (breathing techniques), and Dhyana (meditation) can significantly improve cardiovascular health by reducing stress, improving circulation, and balancing bodily functions. Scientific research supports Yoga's effectiveness in lowering hypertension, strengthening cardiac function, and improving autonomic nervous system activity. The study suggests that integrating Yoga into daily life can reduce the risk factors for CVDs and promote overall well-being.

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