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Therapeutic potential of Omkara chanting in cardiovascular disease with special emphasis on Hridroga: A narrative review

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ABSTRACT

The mortality figure of cardiovascular diseases (CVDs) in India has risen to 4.77 million by 2020 from 2.26 million in 1990. The surge in CVDs over the last three decades is certainly alarming. In Ayurveda, the cardiac conditions are related to Hridroga. The heart, known as Hridaya in Ayurvedic language, is not merely a physical organ of the body, but it is an important citadel for Prana, a vital force that sustains life. From this, one can understand the role of the heart in shaping the physical, emotional, and spiritual health of a person.

It is known from the clinical findings that mental states like stress, anxiety, and depression are closely linked with the health of the heart, which not only affect life but also worsen the course of cardiovascular conditions, leading to illness. Therefore, the psychological dimension needs to be addressed properly in CVD management. The chanting of Omkara, about which a lot of descriptions are found in the ancient yogic traditions, is considered a better option for bringing down the alarming mental states. The utterance of the syllables A, U, and M in the Omkara activates the parasympathetic nervous system, thus increasing variability of high-frequency heart rate, besides bringing a state of good relaxation to the body.

The chanting of Omkara effectively connects the mind with the body. It helps lessen the mental disturbances and increase clarity in mental work. The benefits accrued from chanting of Omkara go beyond the individual and strengthen self-consciousness and internal harmony, which are regarded as cardinal qualities responsible for bringing about balance in society.

The importance of chanting Omkara as a non-pharmacological therapy to help the patients of cardiovascular disorders, supporting their mental welfare, has been described in this article. To achieve sustainable health care in connection with cardiovascular problems, this article describes how to integrate the Omkara chanting into the modern health systems.

Focus has been given to Omkara chanting, cardiovascular disease, mental wellness, sound therapy, holistic approach, and non-pharmacological management.

KEYWORDS: Prevalence of Cardiovascular Diseases, CVD from an Ayurvedic point of view.

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INTRODUCTION

About 60% of total mortality in the global scenario happens due to non-communicable diseases (NCDs). One of them is cardiovascular conditions like ischemic heart disease and cerebrovascular disorders like stroke, which are responsible for about 17.7 million deaths each year. It is known from a WHO (World Health Organization) report that India disproportionately shares 20% of all cardiovascular-related fatalities in the world, which is seen particularly among younger age groups. As per the study conducted by the Global Burden of Disease, the age-standardized mortality rate in India is 272 per 100,000 people, which substantially exceeds the global average of 235 per 100,000 people (1).

The cardiovascular system is known as the circulatory system, which is a vital network that transports blood throughout the body. The heart, blood vessels, and the blood itself form this system. Disorders have a bad impact on the system, causing endocarditis, abnormalities in the electrical conduction path of the heart, and rheumatic heart disease. Cardiovascular disease (CVD) mainly includes cardiac disorders causing coronary artery disease (coronary heart disease), cerebrovascular conditions like stroke, peripheral arterial disease, which hampers the flow of blood to the parts of the body, and aortic atherosclerosis (a condition where fatty deposits build up inside the arteries, narrowing them and potentially restricting blood flow). This buildup is caused by cholesterol, fat, and other substances, leading to serious health issues such as heart attack, stroke, and peripheral artery disease (2). The plaque buildup reduces the space within the arteries, thereby hampering the blood from flowing through, thus restricting

the supply of oxygen-rich blood to vital organs such as the heart, brain, and limbs, causing various health problems.

In Ayurveda, Hridroga (CVDs) is connected with the diseases of the heart, such as pain, etc. According to Ayurveda, the health of the mind determines the degree of cardiovascular conditions of a person. The disturbances across which the mind comes are responsible for the diseases, thus affecting the mental state. The disturbances, such as depression, anxiety, and imbalance of mood depending upon various situations, spectacularly contribute to the growth of mental unrest and force the mind to be in a high-risk zone of complications, coupled with growing mortality usually connected with cardiovascular disease. These mental health problems are responsible for worsening the clinical outlook, coming in the way of cardiovascular health management (3).

Research reveals that the sound-based therapies have a good impact on the mind, harnessing physical balance and emotional well-being. The sound-based therapies help alleviate disorders caused by stress, like chronic pain, anxiety, and depression. In recent years, the sound healing practices, which are mainly concentrated on musical systems, have been proven to be fruitful in alleviating disorders caused by mental worries and stress. This music therapy has recently gained momentum as a successful instrument for increasing mental and emotional health through the use of sound or auditory stimuli, eliciting specific responses or effects in individuals. The auditory stimulation influences physiological or psychological processes(4). The studies of music therapy show that music can have positive effects on heart rate variability, which is linked to autonomic nervous system function.

Research reveals that chanting Om is beneficial, as it removes stress, anxiety, and depression, besides increasing the quality of sleep and regulating autonomic functions in individuals affected by hypertension. Chanting Om is helpful in managing higher blood pressure levels and stress-related problems (5).

MATERIALS AND METHODS:

Prevalence of Cardiovascular Diseases:

In the early stages of cardiovascular diseases, symptoms are not seen in the patients. The CVDs start by affecting the heart and blood vessels and slowly develop into typical disorders. The CVDs play a crucial role in challenging the world's public health systems and therefore need urgent steps to be prevented at the beginning (6). Each year, 17 million people die all over the world due to heart and strokes. The cases of acute coronary syndrome (ACS) and myocardial infarction are considered a high burden of CVDs in India, which have witnessed a rise of about 138% in India since 1990. The growth rate of CVDs in India has exceeded that of the world's mounting death rate to 282 per 100,000 persons, ranging between 264-293, in comparison to the global average of 233 per 100,000, ranging between 229 and 236. It is known that when 271 million people were affected due to cardiovascular diseases in India in the year 1990, by 2019 the number of CVD-affected has risen to 523 million – an alarming rise during the last three decades. The number has almost doubled in India. India may incur economic losses of 2.17 trillion dollars between 2012 and 2030 due to the abnormal and excessive burden of CVDs, according to a joint report revealed by the World Economic Forum and the Harvard School of Public Health (7).

CVD from an Ayurvedic point of view:

In Ayurveda, Hridroga (Hrid means heart and Roga means disease) is known as cardiovascular disorders. The word Hridaya has become a broad subject of debate and discussion from the view of anatomical interpretation, and this debate, even in present times, remains unsolved as the term Hridaya consists of some anatomic entities having different organs, which are supported by their logical explanations. The close observation of Ayurvedic texts on Hridaya suggests that two major organs are ascribed to the Hridaya. According to some ancient Ayurveda scholars, the Hridaya is linked with the brain as the latter is regarded as the center of consciousness and cognition. But many other scholars are of the opinion that Hridaya is nothing but the heart, considering its crucial role in blood circulation, which supports life. Both viewpoints have finally become a reconciliatory approach and, therefore, in Ayurveda, Hridaya has two separate anatomical entities, namely Siro-Hridaya and Uro-Hridaya. While Siro-Hridaya is composed of Buddhi, Manas, Chetana, and Indriyas (intellect, mind, consciousness, and sense organs), Uro-Hridaya refers to the thoracic region, which is especially associated with the flow of Rasa and Rakta. The Rasa and Rakta are known to be fluids circulating through the body, which provide nourishment. From a clinical perspective, in Ayurvedic texts, Hridaya is generally known as the anatomical heart. In Ayurvedic literature, terms such as Hridyata, Hridroga, Hridayamaya, and Hridaya Shula are mentioned, which are referred to as heart-related conditions. These terms are also found in the Vedic texts describing various heart ailments (8).

CVDs and Mental Health:

Those who develop symptoms of mental illness, like schizophrenia, bipolar disorder, and major depressive disorder relating to depression have an increased risk of modifiable cardiovascular conditions. The mortality rate for them from cardiovascular disease is higher than from other diseases. On the other hand, those affected by acute or chronic cardiovascular disorders, in all likelihood, may confront mental health problems. It is known from research that cardiovascular disease and mental disease go hand in hand, having common causes contributing to predisposition, biological pathways, and behaviours related to lifestyle (9). Young adults develop an elevated risk of early cardiovascular disease (CVD) affecting their cardiovascular health (CVH) due to depression and unhealthy mental well-being. The link between cardiovascular exposures and mental health seems to be reciprocal with each other as far as improvement of mental health is concerned, which could have played a role in diminishing CVD risk and increased the health of heart (10). Studies prove that those having cardiovascular disease with other health problems often experience alarming levels of depression, physical disabilities, which bring harm to their general health conditions. The continuing process to control and manage chronic illness can beget continuing stress, adversely affecting the health, giving rise to frequent concerns which are responsible for other psychological and social problems affecting the sleep quality and other social activities in day-to-day life (11).

Mechanism of Action:

It seems that cardiovascular diseases and mental health disorders are interlinked due to multiple biological processes. The chronic activation of the hypothalamic-pituitary-adrenal (HPA) axis, accrued from the ongoing stress and anxiety, which enhances cortisol production, plays a central role in this link between CVDs and mental health disorders. In depression and anxiety disorders increase in cortisol levels and a change in cortisol response to stress are marked. When exposed to high cortisol, the endothelial cells, which line the inner surface (endothelium) of all blood vessels and lymphatic vessels throughout the body, get affected, hampering the balance between pro-inflammatory and anti-inflammatory interleukins and infiltrating the circulating monocytes into the arterial walls, as a result of which atherosclerotic plaques are developed. Moreover, dysregulation of cortisol leads to hyperinsulinemia and insulin resistance, affecting glucose metabolism, which helps diabetes to occur (20).On the other hand, the high level of cortisol helps psychiatric symptoms grow. Long stay of stress and anxiety persistently activate the sympathetic nervous system, causing a hyperadrenergic state which ultimately stimulates vascular inflammation, increasing oxidative stress, developing hypertension and atherosclerosis, which helps cardiovascular disease to grow. It is known from research that interleukin (IL)-I, IL-6, and C-reactive protein and connected to depression, causing cardiovascular conditions in which inflammation in the mechanisms of disorders plays a critical role (11).

Mental Health and Yoga Mantras:

Prayers supported by yoga mantras (hymns) are widely known for effectiveness and benefits for both physical and mental health, besides bringing spiritual development. An experimental study, in which 23 individuals having good health were involved, discovered that rhythmic vocalization (repeatedly chanting a yoga mantra and rosary or counting the beads) has a good effect on the cardiovascular system, producing impressive results. Six repetitions of chanting Yoga mantras (recitations) per minute at a regulated pace increased the synchronization of cardiovascular rhythms. This kind of performance or practice brought a spectacular improvement in baroreflex sensitivity, which is known to be a mechanism to maintain stability in blood pressure. Findings of this experiment show that the rhythmic chanting practices have the potential to align and modulate autonomic functions positively - recitation of specific frequencies of mantra and devotional prayers or hymns helps evoke useful psycho-physiological responses and benefits through which cardiovascular regulation and emotional calm can be achieved (12).

Omakara :

The incantation ‘Om’ is used at the beginning of every mantra. Om is also spelled ‘Ohm’. Omkara is believed to be the original sound from which the universe originated, encompassing all other sounds representing the Supreme Being or Brahman. The syllable ‘OM’ is composed of three sounds – A, U, and M, which are said to represent three states of consciousness, such as walking, dreaming, and deep sleep, and the three realms (earth, atmosphere, and heaven). Omkara is a powerful mantra used in meditation practices to achieve spiritual liberation and connect with the divine. It is also known by other names – Pranava (life-giver) and Udgitha (song or chant). Om represents the totality of existence, encompassing the past, present, and future as well as the three realms of consciousness. It is a sacred sound or mantra transcending religious boundaries. The three syllables also symbolize the cosmic process of creation (Shrishti), preservation (Sthiti), and dissolution (Laya). Om provides spiritual power. It is considered the original vibration of the Universe. Om can be chanted silently or loudly. The sound vibrations created by chanting Om reverberate throughout the body, evoking specific energy and a sense of inner harmony. The repeated chanting of Om helps remove stress and anxiety, giving way to mental tranquility. The sound produced by chanting Om works as a bridge between the outer and inner worlds and makes the inward journey easier in the body, giving a sense of serenity and tranquility. Chanting Om regularly strengthens concentration besides increasing mental balance and physical wellness (13). In Vedic and Yogic thoughts, Om occupies an important place. It is identified as Pranava or the Maha Vakya (great utterance). It is also regarded as a very delicate vibration spreading throughout all existences, echoing divinity. Om is timeless and infinite like the Divine. In Vedic practice, Om is known as the primordial resonance, and knowledge comes out of it. It is known as a seed syllable from which other chants of the Veda emerge to arouse spirituality in its practitioner. This holy syllable is itself a subtle manifestation of the creation, prowess, and unity underlying the universe (14).

Omkar Chanting and Mental Disorders :

In order to have spiritual development and mental balance, chanting Omkar has been in practice for a long even for centuries in India, and it has now crossed boundaries across the globe. Of all forms of chanting practiced all over the world, the chanting of Om has gained significant prominence because of its various benefits and usefulness, especially in the front of emotional or mental well-being. Overall health of an individual rests on mental health, which is very much rudimentary-responsible for the quality of sustaining life. As per WHO, the condition of an individual’s well-being is very much dependent on his or her mental health, which determines his or her ability to lead a life and manage mental normal stress so as to keep himself or herself busy with productive work to prosper society. Despite such an understanding to lead life free from stress, mental disorders have now posed increasing challenges to the individuals who are almost in the tight grip of common mental ailments like depression, anxietVagus nerve, causing stimulation in the Vagal centres. The effect of this stimulatory process is akin to the effect of the technique of vagal stimulation. Thus, chanting Om facilitates better relaxation, thereby being beneficial to both physical and mental conditions (14).

Research conducted on chanting Om has also made it clear that the very chanting has a crucial part to play in the regulation of psychological responses at the time of individuals caught in the negative stimuli. Chanting Om is a meditative practice; it augurs well for mental tranquility, promoting emotional stability and relaxation. The technique of breath-centered mindfulness, which focuses on internal sensations, controls emotion at the time of witnessing emotion-causing images in comparison with passive observation of images. It is believed that meditative practices like chanting Om are beneficial for individuals to stay calm, thus reducing self-referential emotional reactions, which helps in encouraging mental balance (16).

Omkara Chanting and CVD :

An investigation made on the short-term impact of chanting Om on Autonomic Nervous System (ANS) regulation through Heart Rate Variability (HRV) analysis reveals that vocal Om chanting just for five minutes enhances high-frequency (HF) power (parasympathetic activity) among the veteran yoga practitioners. This shows that continuing practice of yoga increases parasympathetic activity, encouraging mental calm and strengthening the balance of the mind. Several factors may be responsible for effecting rise in FH power due to chanting of Om. Recitation of Om produces vibratory resonance, which causes stimulation along vagal pathways, thus giving an effect to parasympathetic activity. About six breaths a minute while chanting Om (breathing rhythm) is likely to increase respiratory sinus arrhythmia, which is considered an indicator of parasympathetic engagement. When an individual practices yoga for a longer time, their Autonomic Nervous System is said to be sensitized due to the conducive effects of such techniques.

Moreover, the slow and rhythmic breathing pattern gained during chanting of Om impacts cardiac autonomic activity, enhancing the high-frequency power. However, it does not change the LF/HF ratio. This raises parasympathetic activity (13).

In order to analyze the impact of chanting Om and Yoga Nidra on those having hypertension with changes in lipid profiles and blood pressure, a clinical investigation was conducted by researchers. The people who practiced Om chanting and Yoga Nidra for two months witnessed spectacular improvement ($P<0.05$) in blood pressure and lipid profiles in comparison to other people. The group of individuals, on whom the experiment was made, showed a downward trend in their systolic and diastolic blood pressure and low-density Lipoprotein (LDL) levels. On the other hand, their high-density Lipoprotein (HDL) level witnessed a rising trend. Negative side effects were not marked in them during the period of observation, which proves that chanting Om by hypertensive patients is safe and beneficial for them (20).

However, there was an evaluative study on the maternal cardiovascular parameters and FHR in 60 pregnant women to assess the immediate effect of Pranava Pranayama along with passive listening to Om chanting on them. The study was done between the control group (breath awareness) and the group practicing Pranava and chanting Om. The study determined that spectacular changes were marked in MHR and FHR just in the wake of breath awareness, Om, and Pranava ($P<0.001$). The cardiovascular response in connection with Rate Pressure Product (RPP) and Double Product (DoP) was significantly marked just following a single session of breath awareness, Om chanting, and Pranava practice. RPP (rate pressure product) was marked to be inversely proportional to HRV (heart rate variability), while HR and RPP increased due to sympathetic activation, the HRV decreased, proving beneficial for cardiac autonomic regulation (17).

Hridaya, Prana, and Oja :

Hridaya is regarded as a place for Prana (life) (18). The power that enforces the body for sustenance is Prana. Oja means energy, strength, vitality, radiance, or essence of life. It represents a key concept in Ayurveda philosophy that signifies the vital energy fueling health, strength, and happiness. In order to preserve Ojas and keep up the vessels of the heart properly, one should be careful in controlling factors causing mental worries or unhappiness. Conducive diets that are responsible for keeping the heart and circulation channels in good condition need to be taken. Principles should be strictly followed to increase mental calm and wisdom so as to keep fit (19). The factors leading to mental calm should always be borne in mind, and accordingly, whatever is needed should be given top priority (20).

DISCUSSION:

Om chanting is a form of meditation that involves the rhythmic repetition of Om. It is a common practice in various spiritual traditions. Chanting of Om helps focus the mind, directing attention away from disturbing thoughts, besides promoting a state of mental clarity. At the time of chanting Om mind remains alert, giving rise to physiological effects which encompass coordination of blood pressure oscillations, cerebral blood flow, and heart rate variability (HRV). During meditative chanting increase in arterial baroreflex sensitivity has also been marked. Chanting Om loudly enhances theta power in EEG (a frequency band in brainwave activity) associated with various cognitive functions and mental conditions. Theta oscillations are also connected to creativity, intuition, and even spiritual experiences. Theta waves in EEG are brainwaves. Theta power in EEG is averaged across all brain regions, giving a lasting effect of relaxation (21). Functional magnetic resonance imaging (fMRI) is an imaging scan that shows activity in specific areas of the brain. During chanting Om, the fMRI showed that the outputs from the insula, anterior cingulate, and orbitofrontal cortices were reduced (22) (23). Slowing down the breath and chanting Om can raise one's vibration. The rhythmic breathing and the sound vibrations of Om work together to give rise to relaxation and potentially increase overall well-being. During chanting, the slow, deep breaths activate the parasympathetic nervous system, reduce heart rate, and promote relaxation. Chanting Om generates vibrations, raising energy levels. During Om chanting, the rate of breathing slows down, inducing airway resistance due to contraction of laryngeal creating vibrational effects which enhance vagal tone, resulting in physiological relaxation. Om chanting can slow down and deepen breath, help regulate the autonomic nervous system, and control involuntary bodily functions like heart rate and breathing. It produces sound waves that impact the respiratory system. It also improves lung function due to deep breathing, reduces stress and anxiety, and promotes mental calm. The changes in the respiratory tract due to chanting Om influence vagal activity, generating peOm. They are neural systems connected with the emotion of 'empathy' (25). The auricular part of the vagus nerve is effectively stimulated by chanting Om loudly 15 times (21). Om chanting impacts the vocal cords. Correct practice is effective and yields better vocal health. Vibration is induced around the vocal cords when chanting is performed, and the production of sound accrued from chanting gives spiritual experience and mental peace. Sounds of correct chanting induce vibratory sensation around vocal cords and ears, and the vibratory sensation so caused is passed through the laryngeal and auricular branches of the vagal nerve, which stimulates vagal centers. Such vibratory sensations induce limbic deactivation and ANS modulation for parasympathetic dominance (22). These impacts could change the electrical signals and neurotransmitters affecting modulation in autonomic centers in the brain, being connected with classical

3Fs such as freeze, fight, and fight response supporting rest and digest (13).

In major depressive disorders, structural hyperconnectivity linking to amygdaloid nuclei in the right hemisphere takes place. Reduction of outputs from the area extending to the amygdala is observed to have therapeutic value. The amygdaloid nuclei, simply referred to as the amygdala, are a collection of nuclei located deep within the temporal lobe of the brain, which is important in processing emotions like fear and aggression, and also memory. The nuclei are part of the limbic system and are extensively connected with other areas of the brain, thus influencing emotional responses, behavior, and the formation of memory (27). This perhaps shows that neural structures linked to attention, emotions, and autonomic nervous system control are activated or spurred into action during chanting of Om (28).

CONCLUSION

In the global scenario, it is commonly known that cardiovascular diseases cause the maximum deaths. Research done on this aspect recently established that there exists a close link between cardiovascular diseases and mental health conditions. Considering this, there emerges a growing emphasis on accessible and non-pharmacological treatment options. Since long therapies involving sound are being practiced as a traditional method of treatment due to their potential healing capacity. Spectacularly, chanting Om has proved to be fruitful as it lends support as an effective means to heal mental disorders, fostering psychological wellness, thus indirectly triggering beneficial effects for a healthy heart through mental wellness generated by the Omkara effect. Therefore, a holistic approach and techniques in this sphere are the need of the hour for the prevention and management of cardiovascular diseases.

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