International Journal of New Media Studies (IJNMS), ISSN: 2394-4331
Volume 12 Issue 2, July-December, 2025, Impact Factor: 8.879

‘’Role of Omkara Chanting in Cardiovascular Diseases with Special Emphasis on Hridroga: A Review‘’

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ABSTRACT

India bears one of the highest global burdens of Cardio Vascular Diseases (CVDs), with annual deaths projected to rise from 2.26 million in 1990 to 4.77 million by 2020. Cardiac diseases are correlated with "Hridroga" in Ayurveda, where Hridaya (heart) is revered as one of the sthana (primary abodes) of prana (life force). This ancient wisdom underscores the heart's profound role not only as a physical organ but as the seat of vitality and life essence.

Beyond their physical implications, CVDs significantly affect mental health, manifesting as stress, anxiety, and depression, which further exacerbate disease progression. Emerging evidence highlights the profound interplay between cardiac health and mental well-being, emphasizing the need for holistic interventions.

Omkara chanting, comprising the sounds A, U, and M, has been shown to enhance parasympathetic nervous system activity, increasing high-frequency (HF) power and inducing relaxation. This ancient yogic practice fosters mental calmness and emotional resilience, addressing the psychological burden of CVDs. Improved mental well-being through Om chanting can lead to enhanced self-harmony, which forms the foundation of social harmony.

This article explores the therapeutic potential of Om chanting in promoting mental tranquillity among CVD patients, emphasizing its role in achieving self and social harmony through yoga. By integrating traditional yogic practices into modern healthcare, we can create a sustainable pathway to holistic wellness.

Keywords: Omkara chanting, CVD, mental health, sound healing, nonpharmacological therapy

INTRODUCTION

Non communicable diseases account for 60% of deaths. CVDs such as ischaemic heart disease and cerebrovascular such as stroke account for 17.7 million deaths and are the leading cause. In accordance with the World Health Organization, India accounts for one-fifth of these deaths worldwide especially in younger population. The results of Global Burden of Disease study state age-standardized CVD death rate of 272 per

100000 population in India which is much higher than that of global average of 235. [1] The cardiovascular system consists of the heart and its blood vessels. A wide array of problems can arise within the cardiovascular system, a few of which include endocarditis, rheumatic heart disease, and conduction system abnormalities. Cardiovascular disease, also known as heart disease, refers to the following 4 entities: coronary artery disease (CAD) which is also referred to as coronary heart disease (CHD), cerebrovascular disease, peripheral artery disease (PAD), and aortic atherosclerosis.[2] CVD s can be correlated with hridroga in Ayurveda. Depression and other mental disorders are an important contributor to the increased morbidity and mortality seen in CVD and comorbid mental disorders.[3] Ample evidence documented sound therapy’s integrative impact on the psycho-emotional and physiological outcomes, which makes it helpful for treating stress-related conditions such as pain syndromes, depression, and anxiety. Sound therapy techniques have become widespread over the past decades, mainly focusing on music among other types of sound stimulation. [4] Studies have proven the effectiveness of Om chanting in reducing depression, anxiety, stress and improving sleep quality and autonomic functions in hypertensive patients. These interventions could thus be considered a safer form of complementary therapy in managing stress and hypertension.[5]

MATERIALS AND METHODS

Prevalence of Cardiovascular Diseases

Cardiovascular diseases (CVDs) are disorders associated with the heart and circulatory system. CVDs are chronic that gradually evolve throughout life and remain asymptomatic for a long time. Moreover, CVDs are the leading cause of global morbidity and mortality, thus creating a major public health concern.[6] Heart attacks and strokes account for more than 80%, and over 17 million annual deaths are caused by CVDs. At present, India bears the greatest burden when it comes to acute coronary syndrome (ACS) and myocardial infarction, representing a 138% increase from 1990. The prevalence of CVDs in India surpasses the global average by a significant margin. For instance, India’s age-standardized death rate for CVDs (282 deaths per 100,000, with a range of 264–293) exceeds the global figure (233 deaths per 100,000, with a range of 229–

236). One of the earlier conducted studies reported that the total number of persons affected by CVDs had nearly doubled, rising from 271 million in 1990 to 523 million in 2019. As per a study conducted by the World Economic Forum and Harvard School of Public Health, India is projected to incur economic losses amounting to around $2.17 trillion due to CVDs between 2012 and 2030.[7]

CVD from an Ayurveda point of view

In Ayureda, CVD can be correlated with Hriroga.(Hrid- Hridaya/ heart, Roga- disease) The (anatomical) term 'Hridaya' itself has been controversial since ages and continues to be so even today. The scholars subscribe to an astonishing range of opinions. The term has been assigned to at least a dozen organs in the body, each claim being backed by reasoning and commonsense. A careful observation and a thoughtful study however reveal that at least two organs share almost equal claims to put themselves synonymous with the term Hridaya. At one end of the scale is the belief that Hridaya is brain. At the other extreme end is the notion that Hridaya refers to heart. The fact that there are firm evidences to support both these views makes the matter still more controversial. Taking to a compromise two Hridaya have been accepted, namely Urohridaya and Sirohridaya – the anatomical interpretation to be bases strictly on the contact refers to the seat of Buddhi, Manah, Cetana and Indrivas. Urohridaya is to be accepted whenever the reference is related to seat of / circulation of Rasa, Rakta, etc. Whenever the term Hridaya appears it should be taken for granted that it is synonymous with Heart. The terms Hridyata, Hridroga, Hridayamaya and Hridaya Sula have been used in Vedas.[8]

CVD's and Mental Health

People with severe mental illness, consisting of schizophrenia, bipolar disorder, and major depression, have a high burden of modifiable cardiovascular risk behaviours and conditions and have a cardiovascular mortality rate twice that of the general population. People with acute and chronic cardiovascular disease are at a higher risk of developing mental health symptoms and disease. There is emerging evidence for shared etiological factors between severe mental illness and cardiovascular disease that includes biological, genetic, and behavioural mechanisms. [9] Depression and poor mental health are associated with premature CVD and suboptimal CVH among young adults. Although this association is likely bidirectional, prioritizing mental health may help reduce CVD risk and improve CVH in young adults.[10] Research indicates that CVD patients with higher comorbidity levels often experience more depressive symptoms, physical limitations, and a decline in overall health status. One of the most immediate reactions to CVDs is stress, which is a natural reaction to receiving a diagnosis. The nature of the long-term illness and its management cause chronic stress that can be detrimental. Continuous stress and worries cause anxiety, which can disrupt daily routines, sleep patterns, and social interactions.[11]

Mechanism of action

Several biological mechanisms are suggested to play a role in the interplay between mental disorders and CVDs. A key factor in this link is the activation of the hypothalamic-pituitary-adrenal (HPA) axis from persistent stress and anxiety, leading to elevated cortisol levels. High cortisol, along with altered cortisol stress reactivity, are commonly observed in disorders such as depression and anxiety disorders. Persistently high cortisol levels cause dysfunction in endothelial regulation, disbalance of pro- and anti-inflammatory interleukins, and the recruitment of circulating monocytes to the arterial wall. All these mechanisms promote the formation of atherosclerotic plaques. It also disrupts glucose regulation, which may progress to hyperinsulinemia and insulin resistance, which can further progress into diabetes [20]. In addition, cortisol itself also induces psychiatric disturbances, thereby perpetuating a vicious cycle. Furthermore, chronic stress and anxiety disorders contribute to sustained activation of the sympathetic nervous system. This prolonged hyperadrenergic state accelerates vascular inflammation and oxidative stress. As a result, hypertension and, eventually, atherosclerosis develop, which cumulatively enhance the progression of CVDs. Additionally, the research shows that elevated levels of inflammatory biomarkers (e.g. interleukin (IL)-1, IL-6, and C-reactive protein) are associated with both CVDs and depression. This emphasizes the importance of inflammation in the pathophysiology of mental disorders and CVDs.[11]

Yoga mantras and mental health

Yoga mantras and prayers have been found beneficial for many physiological and psychological functions of the body. In a study which was conducted to test whether rhythmic formulae, namely, recitation of the rosary and yoga mantras can synchronize and reinforce inherent cardiovascular rhythms and modify baroflex sensitivity with 23 healthy volunteers, it was observed that during both prayers and mantras, there was an increase in the synchronicity of cardiovascular rhythms when they were recited six times a minute. There was also an increase in baroflex sensitivity. These findings suggested that the recitation of the rosary and certain yoga mantras, at specific frequencies, induce favourable psychological and physiological effects.[12]

Omkara

In yoga philosophy, Om is considered a sacred syllable or "mantra," which is contemplated as a universal sound, the seed of all words without reference to any specific religion or God. OM (pronounced as AUM) is the combination of three consonants: A, U, and M. It is the syllable of the past, the present, and the future, signifying the creation, maintenance, and destruction of this universe. In ancient Indian scriptures, OM is considered the most powerful of all the mantras with

positive and beneficial effects on human beings. It is considered a primordial cosmic sound and the totality of all sounds, removing entire psychological pressure and worldly thoughts. Chanting OM is a form of meditation (different mantras used to focus the mind), which is practiced either mentally or with loud repetition. Loud chanting of OM exerts an influence or effect through sound vibrations that resonate on specific parts of the body, creating numerous physical and psychological benefits – paving the way for an inward journey-an experience that is quiet, pleasant, calming, and balancing.[13] OM, is also called Pranav and maha vakya or the Great Sound. It pervades the entire creation and is imperishable and infinite, like God Himself. In Vedic philosophy, it is called Vibration of the Vedas and often attached to the beginning of Vedic mantras as bīja (seed)[14]

Omkara chanting and mental disorders

Chanting is an ancient practice that has been used for centuries to promote spiritual growth and emotional healing. Om chanting, in particular, is a powerful form of chanting that has gained popularity in recent years due to its reported positive effects on mental health.Mental health is a crucial aspect of well-being and has been linked with overall health and quality of life. The World Health Organization (WHO) defines mental health as a state of well-being where an individual realizes their potentials, copes with the stresses of life, works productively, and contributes to their community. However, mental health issues are on the rise globally, with depression, anxiety, and stress levels increasing among people in different age groups.[15]

Although OM has been used in spirituality for centuries, scientific research with quantifiable physical measures started to expand in the 1990s when laboratories explored the effects of OM meditation on human beings by investigating various parameters such as electroencephalograph, neuroimaging, evoked potentials, and other methods. These studies have suggested that chanting OM could produce numerous physiological changes such as increased awareness, sensitivity to sensory transmission, improved concentration, reduced stress levels, heart rate, blood pressure, and skin resistance. Chanting “OM” produces a vibratory sensation in the ears, which spreads through the auricular branch of the vagus nerve, stimulating the vagal centres and producing an effect similar to that of the technique vagal stimulation. Chanting of OM reduces anxiety and depression, facilitating better states of relaxation conducive to improved mental and physical health. [14]

Previous studies indicate that Om chanting, a type of meditation, can regulate and improve individuals' emotion when process negative stimuli and lead to a state of relaxation, and thus modulate the affective ratings on a behavioural level. It has been found that breath-focused mindfulness, a type of meditation which requires participants to focus on internal feelings, produced lower arousal ratings to the affective images than passive viewing. The authors suggested that the meditation allowed the participants to concentrate on the unfolding of experience moment by moment without attaching any evaluative valence to the self-referential processing experience.[16]

Omkara chanting and CVD

In a study intended to assess the immediate effect of OM chanting on ANS modulation using HRV measures revealed that five minutes of loud OM chanting could significantly increase the HF Power (a component of vagal nerve activity) in experienced yoga practitioners compared with novice practitioners. Results suggested that regular practice of yoga bestows calmness by modulating the ANS toward parasympathetic dominance. The significant rise in HF Power (a component of the parasympathetic nervous system) after the chanting of OM might be due to the following effects. (i) The vibratory sensation of OM stimulating vagal centers and modulating ANS toward parasympathetic tone(ii) The respiratory frequency of the chanting (i.e.,) six breaths per minute could increase the respiratory sinus arrhythmia-a reflection of higher parasympathetic activity, and (iii) the years of experience in the practice of yoga and its pre-exposed benefits on ANS. During the chanting of OM, this slow breathing pattern was found to stimulate cardiac ANS activity by increasing the HF power without LF/HF ratio changes. [13]

A study was conducted to find out the efficacy of Om chanting and Yoga nidra in reducing blood pressure and improving lipid profiles in patients with HTN. After 2 months of intervention, a significant ($p < 0.05$) reduction in the BP and lipid profile was observed in the intervention group when compared to the control group. The reduction in systolic and diastolic BP and LDL were significantly ($p < 0.001$) higher in the experimental group. In addition, there is a significant increase in HDL levels in the experimental group. No adverse events were reported during the trial period.[20]

In a study, the immediate effect of Pranava Pranayama along with passive listening to OM chanting and a control period of breath awareness was evaluated on maternal cardiovascular parameters and FHR in 60 pregnant women. The cardiovascular changes immediately after the study were evident in this study between the control group (breath awareness), and the OM and Pranava intervention groups. There were significant changes in MHR and FHR immediately after a single session of breath awareness, OM, and Pranava ($P < 0.001$). The cardiovascular response with regard to Rate Pressure Product (RPP) and Double Product (DoP) was more significant immediately after a single session of breath awareness, OM, and Pranava. RPP is inversely propositional to heart rate variability (HRV), sympathetic activation increases HR and RPP, and decreases HRV and hence, implies improved cardiac autonomic regulation. [17]

Hridaya, Prana and Oja:
Hridaya is considered to be the sthana of Prana [18]. Prana is the vital force of body. Those who want to preserve Ojas and maintain heart and the vessels attached to it in good condition, should avoid such of the factors as may lead to unhappiness (mental worries). Diet and drugs which are conducive to heart and channels of circulation should be taken. Tranquillity and wisdom should be followed meticulously for this purpose [19]. For good mental health, all the ways that calms the mind should be adopted [20].

DISCUSSION

During meditative chanting of OM, a state of mental alertness is induced which is accompanied by physiological effects such as the coordination of blood pressure oscillations (Mayer waves), cerebral blood flow and heart rate variability. At the same time, an increase in arterial baroreflex sensitivity has been observed. After loud OM-chanting, a significant increase in theta power was found in the EEG when averaged across all brain regions, indicating a lasting effect of relaxation.[21] Functional magnetic resonance imaging in healthy individuals showed reduced outputs from the insula, anterior cingulate and orbitofrontal cortices during OM chanting.[22][23]
During Om chanting, the breathing rate is slowed down and airway resistance is induced due to the laryngeal contraction to generate the particular sound and vibrational effects, thereby increasing the vagal tone, and resultant physiological relaxation via parasympathetic arousal. The changes induced in the respiratory tract impact the ascending vagal activity which would produce a widespread action in critical regulatory centres of the brain. The parasympathetic nervous system (PNS) which gets stimulated by the neurotransmitter GABA from the pre-frontal cortex and insular cortex reduces the hyper activity of the amygdala. Similarly, the changes in breathing patterns will increase the release of hormones such as oxytocin, vasopressin and prolactin, meanwhile reducing the stress markers such as cortisol, via the hypothalamo pituitary adrenal (HPA) axis. [24] Previous studies have reported that ‘Om’ sound activates the middle frontal cortex and right supramarginal gyrus which are neural systems associated with the emotion of ‘empathy’ [25] An fMRI study has demonstrated that 15 s loud ‘Om’ chanting stimulates the auricular part of the vagus nerve [21]

Effective chanting of OM is associated with the experience of vibratory sensation around the vocal cords (during the production of sound) and ears (during the perception of sound), expected that these vibratory sensations are transmitted through laryngeal and auricular branches of the vagus nerve, stimulating vagal centers, causing limbic (hypothalamo-pituitary-adrenal axis) deactivation and ANS modulation toward parasympathetic dominance.[22] These effects, similar to vagus nerve stimulation,[22] could alter the neurotransmitters and electrical signals, modulating the activity of the autonomic centres in the brain associated with classical 3F (freeze, flight and/or fight) response in favour of rest and digest.[13]

Of possible therapeutic value is the observed reduction of outputs from these regions to the amygdala, since a structural hyperconnectivity involving the amygdaloid nuclei in the right hemisphere occurs in major depressive disorder.[27] This may indicate that OM chanting activates neural structures involved in attention, emotions and control of the autonomic nervous system.[28]

CONCLUSION

Cardiovascular diseases (CVDs) remain a leading cause of mortality across the globe. Emerging evidence highlights a strong link between mental health disorders and the onset or progression of CVDs. Therefore, exploring non-pharmacological and cost-effective interventions is essential. Among these, sound healing stands out as a time-tested approach used for centuries. Specifically, Omkara chanting has shown significant potential in enhancing mental well-being, which in turn may contribute to cardiovascular health. Integrating such holistic practices could offer a promising complementary strategy in the prevention and management of CVDs**.**

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