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Original Research Article

Effect of ‘Hare Krishna’ chant on mental health of mild to moderate COVID-19 infections: A prospective, interventional, multicentric study

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ABSTRACT

Background: Patients with COVID-19 infections have been shown to be under tremendous psychological stress. Chanting the “Hare Krishna” Mahamantra has been shown to ameliorate the stress markers in other conditions. Hence, we envisaged the present study to evaluate the effect of chanting the Mahamantra in our patients presenting with mild-to-moderate COVID-19 infections.

Materials and Methods: A multicenter, prospective open label study was carried out in adults diagnosed with mild-to-moderate COVID-19 infections confirmed by reverse transcriptase polymerase chain reaction (RT-PCR) test. General anxiety disorder-7 (GAD-7) scale was used for evaluating the psychological well-being of study participants.

Results: One-hundred and twenty patients were recruited. Most of the patients felt anxious, worried that something might happen to them at baseline and the proportion has significantly reduced post-intervention ($p < 0.0001$). The mean (SD) score of GAD scale at baseline was 6.1 (3.4) and was significantly ($p < 0.0001$) reduced after the intervention [0.5 (0.9)]. Similarly, post-intervention almost all the patients either did not have any symptoms of GAD or had only mild compared to the baseline.

Conclusion: We observed a significant reduction in the anxiety levels following daily chanting of Mahamantra in mild to moderate COVID-19 patients. A large well designed controlled clinical trial must be done for further confirmation of the findings from the present study.

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1. Background

COVID-19 pandemic has devastated many lives. It has affected seriously the mental well-being of individuals with COVID-19 infections causing stress, anxiety, panic attacks, and depression.¹ A systematic review estimated anxiety to ranging between 6.33% and 50.9%, depression between 14.6% to 48.3%, and psychological distress in 34.43% to 38% of patients from various developing western

countries.² Emergence of new information about COVID-19 pandemic very frequently, financial despair, restricted movements, and socialization due to lockdown measures, and uncertainty about the future are some reasons affecting mental health.³ The mental affect can lead to poor quality of life, substance abuse, and committing suicides. An estimate from a neighboring country revealed the prevalence of suicidal ideation between 5 and 19.0% with the rate increasing during the pandemic period.⁴

Various interventions such as group psychological behavioral therapy have been shown to be effective for improving the mental health of patients during the current

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pandemic, as well as during the previous Ebola virus and Middle East Respiratory Syndrome-related coronavirus (MERS).⁵ An author from Australia with more than 10 years of experience in treating patients with mental health disorders have stated that spiritual advancement is the only way for improving the psychological well-being of patients with generalized anxiety disorder; and his recommendation is *Bhagavad Gita* for resolving depression and anxiety.⁶ According to Indian vedic traditions, *mantras* consist of elemental sounds, connected to the inner spirit; chanting *mantras* is vital for self-realization.⁷ Chanting “*Hare Krishna*” *Mahamantra* has been shown to relieve stress, depression, and other mental health disturbances in the ancient literature.⁸ Considering the lack of any proven interventions for strengthening the mental well-being amongst patients with COVID-19 infections, we carried out the present study to evaluate the effect of chanting the *Mahamantra* in our patients.

2. Materials and Methods

2.1. Study ethics and study design

The study was initiated after obtaining approval from the Institutional Ethics Committee and approval from the Ministry of Health (EC/NEW/INST/2019/245). The study was carried out in the hospitals dedicated for treating COVID-19 patients approved by Government of India, between April and August 2020, in compliance to the latest update of Declaration of Helsinki guidelines. Written informed consent was obtained from each study participant.

2.2. Study participants

Adults (> 18 years) of either sex diagnosed with mild to moderate COVID -19 infections were recruited. COVID-19 infection was confirmed by reverse transcriptase polymerase chain reaction (RT-PCR) tests. Patients with hearing/speech disability, known psychiatric illness with/without treatment, pregnant or breastfeeding, requiring mechanical ventilation, history of allergies/hypersensitivity reactions were excluded. We adhered to the definition of mild to moderate COVID-19 infections as stated in the clinical management protocol from Ministry of Health, Government of India.⁹ Mild-to-moderate infections were characterized by the presence of all the following symptoms/sings: symptoms of mild pneumonia, respiratory rate less than 30/minute, blood oxygen saturation (SpO₂) > 90%, ratio of partial pressure of oxygen in the blood to fractional inspired oxygen concentration (PaO₂/FiO₂) ratio <300, and absence of any altered mental state/multiple organ failure. Patients with uncomplicated upper respiratory tract infections, with mild symptoms including fever, cough, sore throat, nasal congestion, malaise, and headache were classified as ‘mild COVID-19 disease’. Presence of symptoms suggesting pneumonia with the defined

parameters as stated above was considered as ‘moderate COVID-19 disease’.

2.3. Study procedure

Following consent, the eligible participants were recruited, and the following details were collected: demographic characteristics, details regarding the symptoms and signs pertaining to the current illness, and generalized anxiety disorder (GAD-7) scale. They were then asked to repeatedly chant the *Mahamantra* “*Hare Krishna Hare Krishna Krishna Krishna Hare Hare Hare Rama Hare Rama Rama Rama Hare Hare*”. The participants were trained and instructed to audibly chant the *Mahamantra* 50 times once daily at any time of the day for 15 days. The participants were contacted every day to ensure their compliance to the instructions. The study participants filled the GAD-7 scale on day-1 and day 16 following their discharge from the hospital.

3. Statistical Analysis

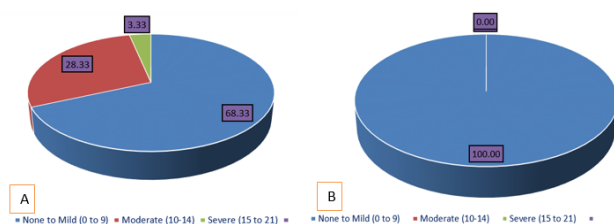
With estimated a sample size of 120 with alpha error of 5%, power of 80%, and assumed proportion of patients with anxiety to an extent of 10%. Descriptive statistics was used for representing the demographic variables. The GAD-7 scale scores were categorized as mild (<9), moderate (10-14), and severe (15-21). Mc Nemar’s test was used for analyzing the differences in the changes in each of the items in GAD scale before and after intervention. SPSS 26.0 was used and a p-value < 0.05 was considered significant.

Table 1: Comparison of pre and post intervention GAD-7 scale in study population.

Item	Pre intervention (n=120)	Post intervention (n=120)	McNemar’s χ^2 Value	p values
Feeling nervous anxiety	104 (86.67%)	12 (10%)	90.01	<0.0001
Not able to stop worrying	87 (72.5%)	5 (4.17%)	80.01	<0.0001
Worrying too much	77 (64.17%)	8 (6.67%)	67.01	<0.0001
Trouble relaxing	67 (55.83%)	9 (7.5%)	56.02	<0.0001
Hard to sit still	52 (43.33%)	3 (2.5%)	47.02	<0.0001
Becoming easily annoyed	73 (60.83%)	13 (10.83%)	58.02	<0.0001
Something might happen	95 (79.17%)	13 (10.83%)	80.01	<0.0001

Table 2: Comparison of GAD scale categories in the study population.

GAD score categories	Pre intervention (%)	Post intervention (%)
0 – 9 (None to mild)	99 (82.5)	120 (100)
10 – 14 (Moderate)	20 (16.7)	0
15 – 21 (Severe)	1 (0.8)	0
Total	120 (100)	120 (100)

**Fig. 1:** A: Generalized Anxiety and Depression Scale (In Percentage): Pre intervention B: Generalized Anxiety and Depression Scale (In Percentage): Post intervention

4. Results

4.1. Demographics

One hundred thirty-eight patients were screened of which 18 were excluded and 120 were finally recruited of which 90 were males. The mean (SD) age was 48.1 (13.5) years.

4.2. GAD scale scores

shows the number of participants presenting with each of the items listed in GAD-7 scale at the baseline and post-intervention. Most of the patients felt anxious, worried that something might happen to them at baseline and the proportion has significantly reduced post-intervention ($p < 0.0001$). The mean (SD) score of GAD scale at baseline was 6.1 (3.4) and was significantly ($p < 0.0001$) reduced after the intervention [0.5 (0.9)]. Similarly, post-intervention almost all the patients either did not have any symptoms of GAD or had only mild compared to baseline (Table 2, Figure 1A, B).

5. Discussion

We carried out the present study to evaluate the effect of chanting *Mahamantra* in 120 patients presenting with mild to moderate COVID-19 infections. We observed a significant reduction in the anxiety symptoms following the chant. Pro-inflammatory markers such as Nuclear Factor- κ B (NF- κ B) and interleukin 1- β (IL-1 β) are critical mediators of stress-impaired neurogenesis and lead to depression and anxiety.¹⁰ Enrichment of the stress environment has

been shown to improve the survival and differentiation of neuronal cells and ameliorate the depression symptoms.¹¹ In the current COVID-19 pandemic era, patients are isolated both physically and socially, and the fear of sufferings from the fellow human beings are universally observed in almost all the patients. Social isolation, loneliness and low socioeconomic status have been shown to upregulate the NF- κ B in previous studies.^{12,13} Excess inflammatory markers worsen the disease and lead to life-threatening complications in COVID-19 patients.¹⁴ Chanting *Mahamantra* has been shown to reduce the levels of stress that was measured by both the clinical features such as heart rate, visual reaction time, auditory reaction time, and based on the cortisol levels in the blood in 30 nurses with moderate to severe stress levels; and the authors observed a significant reduction in the cortisol levels, increased parasympathetic tone, and shortened reaction times.¹⁵

Damrela and others published a study comparing participants assigned to 2 interventions, experimental group chanted audible repetition of, Mantram sound: “Hare Krishna Hare Krishna Krishna Krishna Hare Hare Hare Rama Hare Rama Rama Rama Hare Hare.” And the control group subjects chanted a concocted Sanskrit sound (placebo sound). Experimental group showed statistical significant increase in heart rate variability (The beat-to-beat fluctuation in heart rate). Heart rate variability is associated with several chronic illnesses such as Post traumatic stress disorder (PTSD), myocardial infarction, anxiety, and degenerative neurological disorders. It is also a predictive of a person’s willpower for promoting lifestyles and increases individual’s core psychological capabilities, such as attention and emotional self-regulation.¹⁶

Chanting *Mahamantra* is a form of mediation. Meditation has been shown to increase the release of melatonin, thus enhancing the sense of well-being.¹⁷ In addition to the melatonin release, practice of Omkar meditation has also been shown to improve the cardiorespiratory and psychological profiles.¹⁸ Melatonin has been proposed to be one of the drugs that can be repurposed for using in COVID-19 patients.¹⁹ Meditation practice has been shown to inhibit sympathetic-adrenal medullary system and neuroendocrine axis and results in reduced plasma catecholamine levels.²⁰

To the best of our knowledge, this is the first study evaluating the clinical response using validated psychometric scale following chanting *Mahamantra* in COVID-19 patients. However, the study is limited in not having a control group and in not controlling the other concomitant factors that may influence the outcomes.

6. Conclusion

We observed a significant reduction in the anxiety levels following chanting *Mahamantra* in mild to moderate

COVID-19 patients. A large well designed controlled clinical trial must be done for further confirmation of the findings from the present study.

7. Acknowledgment

The funder of the study had no role in the study design, data collection, data analysis, data interpretation or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Table 3: Authors' Contributions

Items	First author	Second author	Third author	Fourth author
Conception of the idea	✓	✓	✓	✓
Funding acquisition				
Data collection	✓			
Data curation and analysis	✓			
Data interpretation	✓	✓	✓	✓
Writing the first draft of the manuscript	✓	✓	✓	✓
Revisions and agreement on the final draft	✓	✓	✓	✓

8. Source of Funding

None.

9. Conflict of Interest

The authors do not have any conflict of interest.

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