

Effect of Yoga-Nidra as an adjunct to standard treatment in a young male subject with post-COVID pneumonia

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KEY WORDS

Infection Sequelae
Oxygen Saturation
Pulmonary Fibrosis
Tachycardia

ABSTRACT

Post COVID-19 patients tend to suffer from ongoing or new symptoms like shortness of breath, fatigue, lack of mental clarity etc. In some severe cases, these might lead to pulmonary fibrosis and need persistent oxygen requirement. Yoga & meditation interventions have been used as an effective adjunct to chronic respiratory diseases in the past. However, this case presents the use of 20 minutes yoga-nidra sessions to cope-up with persistent low-flow oxygen requirement, tachycardia in a 23-year-old male subject over the course of 9 days. This case shows that regular practice of yoga-nidra, without any breath-work and/or bodily postures, might help aid rehabilitation of post-COVID patients and those with severe pulmonary complications when given as a complementary therapy, especially among those unable to do asana or pranayama due to lack of strength, old-age or any other medical reasons. Future pilot studies are necessitated to create further new evidence. It also brings to light the vast untapped potential of mHealth aided Online yoga-based interventions that may spearhead future research in this domain of knowledge, especially during situations like the COVID pandemic.

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doi: 10.38205/imcr.030121

Introduction

The SARS CoV-2 pandemic has adversely affected the world in the past one and a half years. A significant number of patients who recover from severe COVID pneumonia end up with post-infection sequelae (1,2). About half of the patients with COVID-19 had residual abnormalities on chest CT and PFT at about 3 months as per Matsuo So et al (3). Although pulmonary rehabilitation is the established management strategy in patients with chronic respiratory diseases (4), yet, evidence suggests that yoga interventions act as an effective aid in the management of chronic obstructive pulmonary disease (COPD) (5–7) bronchial asthma (8) and in improving pulmonary function and respiratory muscle strength (9). Here we report the case of a young male who had persistent oxygen requirement post-COVID pneumonia and the role played by Yoga based deep relaxation technique in his recovery.

Case presentation

A 27-year-old male, non-smoker, without any comorbidities had an intermittent, low-grade fever and dry cough for 1 week. It was followed by shortness of breath which increased on exertion. On presentation, to the hospital, his oxygen saturation was 70% at room air. He was diagnosed with severe COVID pneumonia after a positive RT-PCR report and was treated as per the institutional protocol for the

management of COVID pneumonia. Over the next few days, his oxygen requirement increased and was initiated on a high flow nasal cannula (HFNC). After few days again his oxygen saturation started falling and because of respiratory distress, he was intubated and put on mechanical ventilation. Later he was tracheostomized and ventilatory support was continued. During the course, he developed ventilator acquired pneumonia and was treated with antibiotics as per culture sensitivity. The sepsis resolved and he was gradually weaned off ventilation. After 2 months of stay in the ICU, he was shifted to the general ward on minimal oxygen requirement. Repeat High-Resolution CT of the chest showed fibrotic changes in both the lungs. Despite incentive spirometry and chest physiotherapy, his low-flow oxygen requirement persisted. Due to the long hospital stay the subject was anxious and would desaturate immediately on weaning off oxygen support. He had tachycardia and tachypnea and his oxygen requirement kept fluctuating between 2.5 litres to 4 litres. Despite several attempts, we were unable to taper oxygen dependency, therefore, in addition to the medical management, the subject was initiated to yoga-nidra from 10th to 18th of July, 2021.

The subject was asked for his willingness to practice and only after ensuring the same, a yoga professional was called upon to teach him the yoga nidra technique. During yoga-nidra, the subject was asked to not fall asleep but stay awake and take his mind through different parts of the body,

observing and relaxing them mentally. He was asked to gently attend and follow the instructions, without much concentration or effort, as if one is listening to some rhythm or music in a relaxed manner, without any intent. Instructions were in Hindi and each session lasted for about 20 minutes. The professional conducted two guided yoga nidra sessions on the 10th of July (first in the morning and second in the evening). Also, the subject felt deeply relaxed after the very first session and insisted on the continuation of daily practice, hence, setting the stage for this case report. The subject was asked to practice on his own on the 11th, 13th, 15th and 17th of July using pre-recorded audio instructions available online, (10) while the yoga professional visited on alternate days i.e. on the 12th, 14th, 16th and 18th of July, for guided sessions. Regarding compliance, one of the co-authors (SP) was posted as a Junior Resident at the subject's ward and maintained a record of his yoga nidra practice while ensuring his safety and comfort during the practice sessions.

A gradual decrease in tachycardia was observed after each session of yoga-nidra. (Table 1) (Figure 1) Saturation consistently increased from 85% on day-1 to 97% on day-9. Moreover, the oxygen requirement also gradually decreased over the period of 9 days, from 2.5 litres on day-1 i.e., 10th July, to no requirement on day-9 i.e., 18th July, which we were unable to taper off despite several efforts over the past many weeks. (Table 1) (Figure 1) After day-9, the subject started maintaining saturation at room air following which his tracheostomy was closed. He could speak and was happy to hear his voice after a long time. He was discharged on 19th July with advice as per institutional protocol and was grateful to the treating staff. After 15 days of discharge, a telephonic follow-up was conducted on 3rd of August, enquiring about his health condition and general well-being. The subject was compliant to self-practice of yoga nidra (using the pre-recorded audio available online) (10) and was maintaining saturation levels at 97%–98% (self-reported) without requiring any oxygen support. He also shared a photograph of a signed feedback letter, as a note of thanks to the treating hospital team while mentioning his health status at that time. He reported that he was in good health, had joined back at his work and was participating normally in his social and personal life.

Discussions

Although yoga-nidra originates from Himalayan tantric traditions, it is technically considered as a "Pratyahara" practice

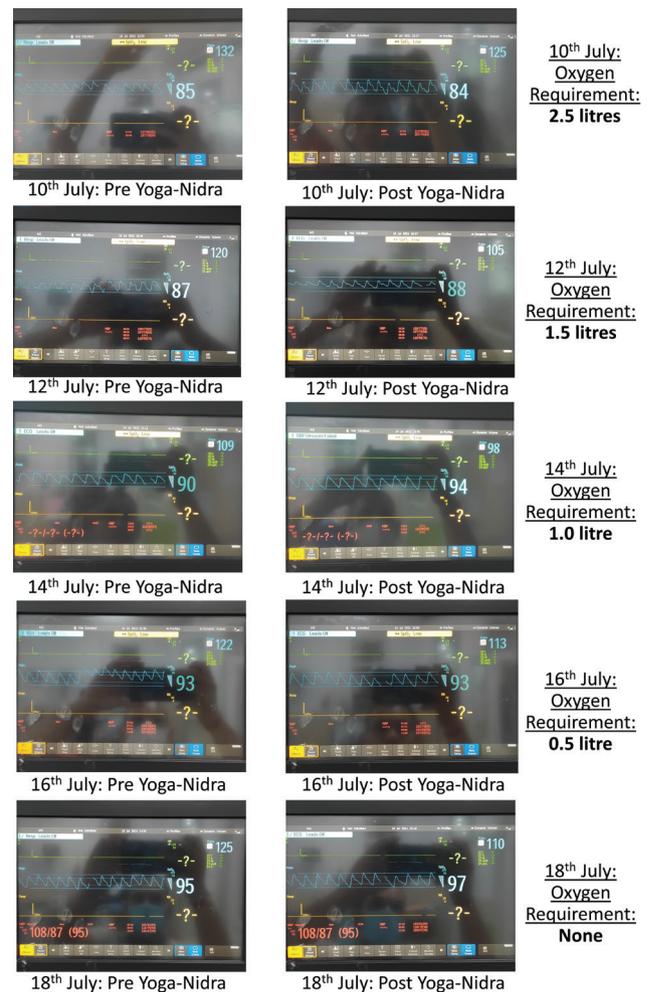


Figure 1: Pulse and SpO2 levels pre & post yoga-nidra, along with oxygen requirement per day, recorded on alternate days from 10th to 18th July 2021

falling under the umbrella of Patanjali's *Ashtanga Yoga* i.e., the 8 limbs of Yoga. *Pratyahara* is the culmination point between the external practices (*bahiranga sadhana – yama, niyama, asana, pranayama*) and the internal practices (*antaranga sadhana – dharana, dhyana, samadhi*), that bridges the gap between the two and helps the practitioner to internalize his/her consciousness, back from the outside world. It is a form of psychic sleep that involves a systematic sequence of body awareness, conscious relaxation and cognitive stimulation

Table 1: Change in Vitals before and after 20 minutes of Yoga-Nidra Practice

Date	SpO2 Before Yoga-Nidra	SpO2 After Yoga-Nidra	Pulse (BPM) Before- Yoga Nidra	Pulse (BPM) After-Yoga Nidra	Oxygen Requirement (per-day)
10 th July 2021	85%	84%	132	125	2.5 Litres
12 th July 2021	87%	88%	120	105	1.5 Litres
14 th July 2021	90%	94%	109	98	1.0 Litre
16 th July 2021	93%	93%	122	113	0.5 Litre
18 th July 2021	95%	97%	125	110	NIL (on room air)

and induction that was developed by Swami Satyananda Saraswati. However, in the case of our subject, we used a simpler version of the practice demonstrated by H.H. Sri Sri Ravi Shankar available online (10).

From this case, we infer that the stress & anxiety caused due to a long stay in the hospital ward might have been reduced by regular practice of yoga-nidra. It might have also led to a reduction in sympathetic arousal and reduced emotional distress which in turn improved quality of sleep, thus rejuvenating the body and helping the mind remain calm. This is evident from the improved oxygen saturation and a consistent drop of tachycardia and oxygen requirement over the course of intervention. (Figure 1) (Table 1) Further research is warranted to replicate the findings.

Research on yoga-nidra is still in its evolutionary phase, however, studies to date suggest its efficacy in coping with depression, anxiety and insomnia (11–14). It's been shown to increase alpha brain wave activity (15), Heart Rate Variability (HRV) (16), and Dopamine secretions (17), all three of which are considered strong measures of the body's stress accommodation response. HRV directly and accurately depicts the health status of an individual's autonomic nervous system (ANS).

The ANS plays a crucial role in responding to hypoxia. Hypoxia triggers peripheral chemoreceptor reflex causing hyperventilation and sympathetic activation of the cardiovascular system causes increases in heart rate and cardiac output which helps to improve pulmonary and tissue perfusion (18). Apart from the significant strong response of the ANS, there exists a phenomenon of cardiorespiratory phase synchronization (CRPS). A study by Zhang and Jin demonstrated that autonomic regulation with different physiological stress like hypoxia strongly influenced cardiorespiratory coupling based on the observations made during phase synchronization between heartbeats and breathing during hypoxia (19).

Subjective perceptions of increased heart rate during acute psychological stress are consistently associated with anxiety (20). Stress is also considered a co-factor in infectious disease susceptibility and outcomes (21). Moreover, prolonged stress is responsible for tissue damage caused due to the inflammatory response triggered amongst various bodily tissues, including those of the lungs (22). Meditation and yoga-nidra can aid in reducing this inflammatory load caused by the immune cascades or "Cytokine Storm" arising from an infectious disease like SARS, MERS or COVID (22).

Conclusions

Past literature is evident on the use of yoga nidra for relieving stress, anxiety and sleep-related issues. However, no prior studies have shown any patients with post-COVID pneumonia reduce oxygen requirement, lower tachycardia and improve oxygen saturation over the course of 9 days, all with the help of a simple 20 minutes practice of yoga nidra without any adjunct asana, pranayama or other yoga practices. Hence, justifying the novelty and the need for reporting the same. It

strengthens the claim that Pranayama and Yoga interventions might help prevent COVID on the first hand and aid rehabilitation for post-COVID patients. This opens a new array of possibilities, regarding research on yoga-nidra as an adjunct to standard treatment for patients with post COVID complexities. Remote modes of delivering yoga interventions (online, pre-recorded etc.) can be useful for COVID suspected/positive cases and act as a potential window for future research in this field. Practices like yoga-nidra and meditation can be useful for bed-ridden patients, for those having low mobility, or for those who are unable to practice pranayama/breath-work, as they involve minimal effort, yet, might prove beneficial in maintaining health and aiding recovery. This re-establishes the fact that yoga is not limited to bodily postures and breathing, but goes well beyond the physical realm and can act as a great tool for mental relaxation and emotional healing when used optimally.

Acknowledgement

We are thankful to the subject for his cooperation, to the HOD – department of internal medicine and the staff members of the general ward.

Limitation

This was a single case report and further pilot studies are needed to generate strong evidence.

Authorship contribution

PB & SP: wrote the manuscript

PB: provided yoga-nidra intervention

SP: observed the subject and recorded history

RK and MP: were the treating consultants and VKR guided in preparation and revision of the manuscript.

Informed consent

Written informed consent was obtained from the subject for publishing his case.

Source of funding

Nil.

Conflict of interest

Nil.

Received Date: 30-08-21; Revised Date: 25-11-21

Accepted Date: 30-11-21

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