Exploring the Efficacy of Shirodhara as an Add-on Therapy for Alleviating Post-COVID Anxiety and Depression: A Case Study

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Case Report

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Abstract

Background

This study explores post-COVID-19 psychological challenges in a 31-year-old female patient—manifesting as Anxiety, fatigue, weakness, irritability, anger, and concentration issues. The treatment approach combines SSRI and Clonazepam medications with Shirodhara therapy using Balashwagandhadi taila, presenting a novel and comprehensive intervention strategy.

Methods

The patient was evaluated using recognized scales, such as HAM-A, HDRS, PHQ-9, and QOL. Additionally, monitoring serum cortisol levels served as a potential physiological marker. The integrative treatment approach addresses psychological symptoms and potential underlying physiological mechanisms.

Results

Significant improvement is observed across various domains, evidenced by reduced HAM-A, HDRS, and PHQ-9 scores and enhanced QOL. Post-Shirodhara therapy, a notable increase in serum cortisol levels from 3.09 ug/dL to 11.76 ug/dL, suggesting a correlation with clinical improvements.

Conclusion

This case underscores Shirodhara’s promising role as an adjunctive therapy for post-COVID-19 Anxiety and depression. Findings advocate further exploring integrative approaches in post-viral psychological care, emphasizing addressing psychological and potential physiological aspects for holistic recovery.

1. Introduction

In December 2019, the emergence of a highly infectious single-stranded RNA virus, classified as SARS-CoV-2, caused severe acute respiratory syndrome. By January 2020, WHO declared it a public health emergency, later elevating it to a pandemic in March of the same year. [1–3] Subsequently, a substantial proportion (approximately 70%-80%) of post-COVID-19 patients exhibited diverse symptoms, spanning cardiac, neurological, dermatological, and multisystem manifestations. [4, 5] Despite the significant attention given to respiratory distress, myocardial infarction, and stroke, there appears to be a global neglect of neuropsychiatric manifestations. A self-reporting questionnaire study by Kamal et al. revealed prevalent symptoms in recovered COVID-19 patients, with fatigue (72.8%), anxiety (38%), and joint pain (31.4%) being the most reported. Notably, 80.2% of this cohort had mild cases necessitating home self-isolation. [6].
The impact of COVID-19 extends beyond physical health, profoundly affecting mental health, with reported psychiatric symptoms such as posttraumatic stress symptoms (PTSS)/posttraumatic stress disorder (PTSD), anxiety, and depression. [7]

Biological and psychological factors can cause persistent symptoms. SARS-CoV-2 RNA, for example, may persist in brain tissue for an extended period, worsening neuronal loss [8–11].

Interestingly, despite various immune disturbances in Long COVID, low cortisol levels were evident, particularly in cases with increased depression and anxiety. [12]

Dysfunctional blood-brain barrier entry by innate immune cells and factors such as social isolation, confinement, acute infection trauma, and chronic fatigue have been linked to prolonged neuroinflammation, mainly contributing to sleep disturbances.[13, 14]

Acknowledging the neglected neuropsychiatric aspects, it becomes imperative to raise awareness and research efforts for effective interventions in post-COVID-19 syndrome. Current interventions blend pharmacological and psychological components, with traditional antidepressants and psychotherapies showing efficacy. However, concerns about side effects and low adherence rates highlight the need for alternative approaches.

In the realm of Ayurveda, the condition aligns with vishada and avasada, with Kapha pradhana tridosha imbalances observed in severe cases and Kapha-vataja derangements in mild cases. Ayurvedic texts mention vishada as a vataja nanatmaja vikara, emphasizing its prevalence in individuals with low mental strength.[15, 16] Shirodhara, a non-invasive Ayurvedic technique involving the steady dripping of oil on the forehead, has demonstrated efficacy in treating insomnia, anxiety, stress, headache, and hypertension. [17, 18] Various studies support its anxiety-reducing effects, with findings indicating decreased plasma noradrenaline levels. The potential benefits of Shirodhara in mitigating disruptions of mansika bhava and anxiety disorders underscore its therapeutic promise. [19, 20]

### 2. Case Report

In February 2023, a 31-year-old woman sought admission to the inpatient department of Ayurvedic and Unani Tibbia College and Hospital in New Delhi, presenting persistent symptoms of anxiety, fatigue, weakness, irritation, anger issues, and loss of concentration that had endured for a year before her admission. At LHMC in Delhi, the patient was diagnosed with post-COVID anxiety along with mild depression. She had been taking anxiolytic and anti-depressant medications for the past ten months. The chronological order of complaints and events is shown in Table 1. She didn't have any allergies. The patient's informed written consent was obtained before the examination and procedure began.

#### 2.1 Diagnosis
The Hamilton Anxiety Rating Scale (HAM-A), Hamilton Depression Rating Scale (HDRS), Patient Health Questionnaire (PHQ-9), and Quality of Life (QOL) were used to make the diagnosis. In addition, the Sr. Cortisol marker was determined by the CLIA method. The cause of the symptoms aggravated suggested that the patient had Vata Dosha predominance.

2.2 Clinical Findings

2.2.1. General examination and personal history

The patient's overall health was satisfactory. There was no deviation in vital signs. The patient led a sedentary lifestyle and had a BMI of 22.1 Kg/m². There is no previous history of substance abuse. Her mother suffered from anxiety as well. Table 2 displays biochemical parameters such as CRP, Serum Cortisol, and Systemic Immune Inflammation Index at the baseline and the end of Shirodhara therapy (15th day). The appetite, bowel movements, and urine frequency were all normal. However, the patient's sleep was disturbed.

2.2.2. Therapeutic Focus and Assessment

In the adoption of a comprehensive therapeutic paradigm, Balashwagandhadi taila, a concoction with Bala and Ashwagandha as primary ingredients and Tila (Sesamum indicum) taila as the base, recognized for its efficacy in addressing Vata dosha imbalances like - anxiety, was used for Shirodhara. Stringent microbial analysis ensured the purity of the taila, with minimal contamination observed for enhanced safety. The procedure began with the assessment of patient eligibility based on symptoms such as anxiety, mild depression, headache, and sleep disturbances.

The Pre-operative procedure (Purvakarma) involved a calming massage of the head, neck, and shoulders, followed by applying protective measures such as a cotton cord, eye pads, and ear closure. During the procedure, Balashwagandhadi oil was heated to a precise temperature of 42.0°C ± 0.4°C and maintained at this constant temperature.

The operative procedure (Pradhana karma) involved the use of a specialized dripping apparatus called Dharapatra to carefully pour lukewarm Balashwagandhadi oil daily for 45 minutes over a period of 14 days.

Post-Shirodhara, as Post-operative measures (Pashchata karma) the patient underwent Rasnadi churna application, followed by a lukewarm water bath and light dietary regimen. Simultaneously, allopathic medications—Tab Paroxetine 25 mg, Tab Propranolol 20 mg, Cap. Omez 20 mg, and Tab Clonazepam 0.5 mg—were integrated into the treatment plan.

Patient assessments, including HAM-A, HAM-D, PHQ-9, and QOL, were conducted before treatment and on the 8th, 15th, and 30th days. Biochemical parameters, notably Sr. cortisol, delineated the pre-and post-treatment trajectory, culminating in the final assessment i.e. on the 15th day.
3. Results

The baseline serum cortisol level was 3.09 ug/dL, which increased to 11.76 ug/dL after Shirodhara therapy. Table 3 and Fig. 1 display the HAM-A, HAM-D, PHQ-9, and QOL scale assessments at various time intervals. The HAM-A, HDRS, and PHQ-9 all showed a significant reduction in score, with 76%, 74%, and 96%, respectively. Moreover, after Shirodhara therapy, QOL increased by 34%.

3.1. Effect of Shirodhara on HAM-A, HAM-D, PHQ-9, and QOL scale (Fig. 1)

3.1.1 Clinical outcome

According to the assessment, there was a satisfactory response and many of the symptoms were reduced even after the seventh day of Shirodhara. Many HAM-A, HDRS, PHQ-9, and QOL scale domains showed significant improvement.

The final assessment was performed on the 30th day, i.e. 15 days after Shirodhara therapy. Anxiety and depression were significantly reduced. The patient's mental state, mood, and sleep were all improved. After 14 days of Shirodhara, the level of Sr. Cortisol increased significantly. The patient's pulse rate was unaffected. In addition, with an increased sense of well-being, the dose and frequency of allopathic medications were reduced. Overall, she felt better, and her sleeping pattern improved significantly.

4. Discussion

The current case report is about a patient who has been suffering from severe anxiety-mild depression for over one year and has been on allopathic medications for eight months with limited relief, so Shirodhara was used as an adjunct therapy to provide better relief. The purpose of this study was to determine the synergistic effect of modern medications combined with Shirodhara as an add-on therapy on COVID-19-induced anxiety, depression, and poor QoL. It was effective in reducing psychosomatic symptoms as well as post-COVID-19 anxiety and depression markers.

Among the Murdha Taila, Shirodhara is a form of Parisheka. Science has yet to be able to explain Shirodhara's mechanism of action. However, studies show that the autonomic nervous system shifted towards parasympathetic dominance right after Shriodhara.[20] Moreover, an improvement in the sleep pattern occurs, accompanied by reductions in heart rate and systolic and diastolic blood pressure. [21, 22]. Thus, a "composure response" may be brought on by Shirodhara.

Shirodhara applies a specific pressure and vibration to the forehead that has therapeutic benefits for reducing stress, anxiety, and other unpleasant feelings [21, 23]. Shirodhara is also a primary treatment option for anxiety due to evidence supporting its pharmaco-dynamic effects [19, 20].

Shirodhara might have an effect by lowering Vata Dosha, according to Ayurveda. The vata dosha is accountable for the fluctuation of thoughts in the mind. Since anxiety is one of the factors contributing to
Vata dosha imbalance, Balashwagandhadi taila was chosen for Shirodhara in this case because it pacifies Vividha Vataroga (a variety of disorders induced by Vata dosha aggravation). Balashwagandhadi Taila comprises ingredients that have Vata pacifying, Balya (strengthening), Brimhana (tissue nourishing), and Rasayana (rejuvenating) properties [24–26].

SARS CoV2 modulates the expression of angiotensin-converting enzyme 2 (ACE 2), and ACE 2 is expressed not only in the lung but also in the hypothalamus, adrenal, and pituitary glands. This results in the hypothalamic-pituitary-adrenal axis becoming dysfunctional, which in turn causes neuropsychiatric symptoms like anxiety and depression in our case. In COVID-19, inflammatory cytokines released activate microglial cells, leading to severe neuroinflammation. [27]. Stress brought on by the pandemic further synergizes the aforementioned pathophysiology of anxiety and depression in COVID-19. In Long COVID, there was an evident hypocortisolemia as well as an upsurge in depression and anxiety [12]. In this case, the Sr. Cortisol level was initially low at the baseline and significantly increased following the 14-day Shirodhara therapy. This outcome reflects the impact of Shirodhara on the HPA axis.

The psycho-neuro-immunological effects of Shirodhara include:

- A reduction in noradrenaline levels.
- Manifestations of sympatholytic effects.
- Activation of peripheral skin circulation.
- An increase in natural killer cell levels.

Shirodhara therapy induces physiological changes comparable to meditation, such as increasing α and θ wave activity in the brain and causing a decline in heart rate. These results suggest that Shirodhara alters how the frontal lobe, limbic system, brain stem, and autonomic nervous system function [19, 28, 29]. Shirodhara lowers the generalized social phobia and GAD-related daytime sleepiness [30]. This case study offers potential for an integrative treatment strategy for post-COVID depression and anxiety with results that are encouraging.

5. Patient Perspective

5.1. Patient perspective

After three days of Shirodhara, the patient reported a sound and regular sleep pattern. The patient's anxiety level had significantly decreased. Sadness, hopelessness, and helplessness were also significantly reduced. Furthermore, the patient began to show an interest/pleasure in doing things. The patient began to feel more energized as well. Concentration also improved. The patient felt sleepy and happy after the Shirodhara, in particular.

6. Conclusion
Shirodhara significantly improved the serum biomarker of stress, i.e. Serum Cortisol, which increased after Shirodhara. On the 8th and 15th day of Shirodhara, it provided significant relief in the grading of the HAM-A, HAM-D, P.H.Q-9, and QOL Score. Somatic anxiety (physical symptoms associated with anxiety) and psychic anxiety (mental agitation and psychological distress) both improved significantly. In addition, with an increased sense of well-being, the dose and frequency of allopathic medications were reduced as well. This therapy was discovered to be an effective treatment for anxiety with mild depression.

**Declarations**

**Author Contributions**

The project involved MKS, APV, DK, SB, and BB. They collectively contributed to Conceptualization, Methodology, Formal Analysis, Investigation, Data Curation, Writing – Original Draft, Visualization, and Project Administration. MKS, APV, DK, and BB were involved in Validation, while SB led Data Curation. APV, DK, SB, and BB supervised the project and provided Writing – Review & Editing. MKS primarily handled Writing – Original Draft. Funding acquisition was not applicable, and Software was not used.

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Dr. Nitin Jindal, Associate Professor, AUTCH, Karol Bagh, New Delhi.

**Informed consent**

The patient provided written informed consent for this case study.

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None.

**Conflict of interest**

None

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References


### Tables

**Table 1**  
Timeline (Chronological order of complaints and events).

<table>
<thead>
<tr>
<th>S. No</th>
<th>Complaints/Events</th>
<th>Duration/Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.</td>
<td>Contracted COVID-19, experienced moderate symptoms, and managed to recover after 1–2 weeks of isolation at home. However, even after her physical recovery, she found herself struggling emotionally and mentally.</td>
<td>Dec-Jan 2022</td>
</tr>
</tbody>
</table>
| 02.   | - Mood swings, irritability, difficulty concentrating, feeling constantly fatigued, and lost interest in activities she once enjoyed.  
- Sleep disturbances, nightmares | Feb-Mar 2022 |
| 03.   | Worsening of depression and anxiety symptoms for which she took consultation from LHMC, Psychiatry Dept. and was prescribed medications - Tab Paroxetine 25 mg, Tab Propanolol 20 mg, Cap. Omez 20 mg, and Tab Clonazepam 0.5 mg. | Apr 2022 |
| 04.   | - Continued prescribed medications as per monthly consultations at LHMC.  
- Persistent, though less severe, anxiety and depression symptoms | May 2022-Jan 2023 |
| 05.   | HAM-A = 42, HAM-D = 23, P.H.Q-9 = 24 and QOL = 59. | 13.02.2023 |
| 06.   | Sr. Cortisol decreased, Started the Shirodhara procedure. | 14.02.2023 |
| 07.   | Gradual improvement in overall symptoms.  
HAM-A = 19, HAM-D = 08, P.H.Q-9 = 07 and QOL = 72. | 21.02.2023 |
| 08.   | A pleasant feeling after Shirodhara therapy with gradual improvement in symptoms as well.  
Sr. Cortisol increased, HAM-A = 10, HAM-D = 6, P.H.Q-9 = 01 and QOL = 79 | 28.02.2023 |

(HAM-A = Hamilton Anxiety Rating Scale, HDRS = Hamilton Depression Rating Scale, P.H.Q-9 = Patient Health Questionnaire and QOL = Quality of Life.)
Table 2: Hematological/Biochemistry Investigation

<table>
<thead>
<tr>
<th>Test name</th>
<th>1st Assessment</th>
<th>2nd Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>15th day</td>
</tr>
<tr>
<td>C.R.P (C-Reactive Protein)</td>
<td>2.48 mg/L</td>
<td>2.38 mg/L</td>
</tr>
<tr>
<td>Serum Cortisol</td>
<td>3.09 µg/dL</td>
<td>11.76 µg/dL</td>
</tr>
<tr>
<td>SII (Systemic Immune-Inflammation Index)</td>
<td>245.82</td>
<td>408.72</td>
</tr>
</tbody>
</table>

Table 2: Biochemistry investigations of the patient at baseline and at the end of Shirodhara therapy.

Table 3: Details of HAM-A, HAM-D, P.H.Q-9 and QOL at various time intervals.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Scales</th>
<th>Baseline</th>
<th>8th day</th>
<th>15th day</th>
<th>30th day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HAM-A</td>
<td>42</td>
<td>19</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>HAM-D</td>
<td>23</td>
<td>8</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>P.H.Q-9</td>
<td>24</td>
<td>7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>QOL</td>
<td>59</td>
<td>72</td>
<td>79</td>
<td>79</td>
</tr>
</tbody>
</table>

Table 3: Details of scoring at the 0 day, 8th day, 15th day, and 30th day.

Figures
Figure 1

illustrates the scale evaluations conducted at different time intervals.

- **X-axis**: Time Interval
- **Y-axis**: Scoring of the Scales Used for Evaluations