

**KSHEERA SHIRODHARA IN THE MANAGEMENT OF ANIDRA (INSOMNIA): A
CRITICAL REVIEW OF THE DHARA DRAVYA RATIONALE, CLINICAL EVIDENCE
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ABSTRACT

Background: *Nidra* (sleep) is recognised in *Ayurveda* as one of the *Trayopastambha*—the three fundamental pillars sustaining life. Its disturbance, *Anidra* (insomnia), is described as a disorder primarily arising from *Vata* imbalance. Insomnia is now among the most prevalent health concerns, and prolonged use of hypnotic drugs carries risks of tolerance and dependence. *Shirodhara*, the continuous pouring of warm liquid over the forehead, is a widely practised external (*Murdha Taila*) therapy for *Anidra*. Although various liquids are used—such as medicated oils, milk, buttermilk, water, and decoctions—the rationale for specifically employing *Ksheera* (milk) has seldom been critically examined. **Objective:** To examine the classical foundation and probable mechanism of *Ksheera Shirodhara* in *Anidra*, and to evaluate comparative clinical evidence addressing a practical question: does therapeutic efficacy depend more on the choice of *Dhara Dravya* or on the procedure itself? **Methods:** Classical *Ayurvedic* texts and contemporary clinical and experimental studies retrieved from *Ayurvedic* and biomedical databases were reviewed and synthesized narratively. **Results:** *Ksheera*, owing to its *Madhura Rasa*, *Snigdha Guna*, *Sheeta Virya*, and *Madhura Vipaka*, is theoretically well suited to counter the *Vata* pathology of *Anidra*. Classical *Dhara Kalpa* references specifically recommend *Ksheeradhara* for *Nidranāśa*. Comparative studies report improvement in subjective sleep outcomes with *Shirodhara*, but show minimal differences between the liquids used, suggesting that the procedure itself contributes substantially to the therapeutic effect. However, available trials are limited by small sample sizes, open-label designs, and reliance on subjective measures. **Conclusion:** *Ksheera Shirodhara* presents a coherent classical rationale and supportive, though methodologically limited, clinical evidence in *Anidra*. Whether milk provides additional benefit beyond the procedure remains uncertain, highlighting the need for larger, rigorously designed trials with objective sleep assessments.

KEYWORDS: *Anidra*; Insomnia; *Shirodhara*; *Ksheera*; *Dhara Dravya*; *Panchakarma*.**INTRODUCTION**

Ayurveda identifies *Nidra* (sleep) as one of the three *Upastambha*, along with *Ahara* (food) and *Brahmacharya*, upon which the strength, complexion, and growth of the body are said to depend.^[1] *Charaka* emphasizes that happiness and misery, nourishment and

emaciation, strength and weakness, and even knowledge and ignorance are determined by sleep that is timely or untimely.^[2] When sleep is lost or disturbed, the condition is termed *Anidra* or *Nidranāśa*, and is classified among the *Vāta Nānātmaja Vyādhis*—disorders arising from the vitiation of *Vāta* alone.^[3,4,5]

In contemporary medicine, insomnia is defined as dissatisfaction with the quantity or quality of sleep, manifesting as difficulty initiating or maintaining sleep, or early awakening, accompanied by daytime impairment.^[6] It is among the most prevalent health complaints; community surveys show that about one-third of adults report at least one insomnia symptom and about 6% meet diagnostic criteria for insomnia, and it is strongly associated with psychiatric and chronic medical conditions.^[7,8,9] First-line pharmacological therapy with benzodiazepine and non-benzodiazepine hypnotics is effective in the short term but is limited by next-day sedation, tolerance, and dependence with prolonged use. These limitations have sustained interest in non-pharmacological and traditional approaches that may be suitable for long-term management.

Among *Ayurvedic* interventions for *Anidra*, external procedures directed at the head—collectively termed *Murdha Taila*—are especially prominent, with *Shirodhara* being one of the most widely used forms.^[10] A notable feature of both classical and contemporary practice is the diversity of liquids employed: medicated oils (*Taila*), milk (*Ksheera*), buttermilk (*Takra*), water (*Jala*), and herbal decoctions (*Kwatha*) are all used, often for the same indication. This raises a rarely addressed question: on what basis is a particular *Dhāra Dravya* selected, and to what extent does this choice influence therapeutic efficacy?

The present review examines this question in relation to *Ksheera Shirodhara*. It outlines the classical rationale for milk as a *Dhāra* medium in *Anidra*, appraises the comparative clinical evidence, and considers the probable mechanism of action, thereby clarifying what can and cannot yet be claimed.

MATERIALS AND METHODS

This study is presented as a narrative review. Classical source material was drawn from the *Bṛhat-trayi*—namely the *Charaka Saṃhitā*, *Suśruta Saṃhitā*, and *Aṣṭāṅga Hṛdaya*—together with the *Dhara Kalpa* literature on *Dhāra* therapy and standard commentaries. Contemporary literature was identified through searches of PubMed, Google Scholar, and AYUSH research repositories, as well as the archives of indexed *Ayurvedic* journals. Search terms included *Anidra*, *Nidranāśa*, insomnia, *Shirodhara*, *Ksheera*, *Dhāra Dravya*, and *Murdha Taila*.

Clinical and experimental reports in English concerning *Shirodhara* in insomnia were considered, with priority given to comparative studies and those employing validated outcome measures. Because the identified studies were heterogeneous and largely open-label, findings were synthesised narratively rather than by meta-analysis, and no formal risk-of-bias scoring was applied. Each citation was verified against its original source record before inclusion.

Nidra and Anidra: The Ayurvedic Concept

Classical physiology attributes sleep to the withdrawal of the mind and sense organs from their objects. *Charaka* explains that when the mind, along with the sensory and motor faculties, becomes fatigued and disengages from its objects, sleep ensues.^[2] *Suśruta* locates the phenomenon in the covering of the *Hṛdaya*—the seat of consciousness—by *Tamas*^[11], while *Vāgbhaṭa* emphasizes the role of *Kapha* (*Śleṣma*) and *Tamas* in obscuring the channels of the mind.^[12] Thus, *Nidra* is physiologically governed by *Tamas* and *Kapha*, its natural nightly occurrence being one of six types described in the classical texts.

Anidra arises when the factors that ordinarily induce sleep are disturbed. The dominant element in its pathogenesis is aggravated *Vāta*, often accompanied by *Pitta*, against a background of depleted *Tamas* and *Kapha* in the channels of the mind.^[13] Psychological factors such as *Chinta* (worry), *Soka* (grief), *Bhaya* (fear), and *Krodha* (anger) are repeatedly cited as precipitants, reflecting the close relationship the classics draw between *Vāta* and *Manas*. The clinical picture described in the texts includes *Jṛmbhā* (yawning), *Tandrā* (drowsiness), *Aṅgamarda* (body ache), *Arati* and *Klāma* (restlessness and lassitude), *Śīrasūla* (headache), *Jadya* (heaviness), and *Apakti* (impaired digestion).^[12] Because *Vāta* is central to the disorder, therapies that pacify *Vāta*—particularly unctuous, warming, and stabilizing measures applied to the head—form the cornerstone of management.

Shirodhara: Concept and Classical Basis

Shirodhara belongs to the group of *Murdha Taila* therapies—oleation procedures directed at the *Śīras* (head), which *Ayurveda* regards as the *Uttamāṅga*, the supreme part of the body and the seat of the senses and the mind.^[14] In this procedure, the patient lies supine while a warm liquid is released from a suspended vessel in a steady, unbroken stream onto the forehead, traditionally over the region between the eyebrows, and is gently moved from side to side for approximately thirty to forty-five minutes.

The head is the chosen site because the disorders for which *Shirodhara* is employed—such as insomnia, anxiety, headache, and other *Mānasika* and *Vātaja* conditions—are conceived as disturbances of the structures and channels of the head. Classical literature on *Dhāra* therapy (*Dhara Kalpa*) prescribes different media according to the state of the *Doṣas*: *Taila* for *Vāta*, *Ghṛita* for *Pitta*, and *Takra*, *Ksheera*, or *Kwatha* in various combinations.^[15] This *Doṣa*-guided selection forms the conceptual foundation of the present inquiry, as it implies that the medium is not interchangeable but is chosen specifically to counter the underlying pathology.

Ksheera as a Dhara Dravya: The Rationale

The rationale for employing milk as a *Dhāra* medium in *Anidra* rests on its *Rasa*, *Guṇa*, *Vīrya*, and *Vipāka* profile. *Ksheera* is *Madhura* (sweet) in both *Rasa* and *Vipāka*, *Snigdha* (unctuous) and *Guru* (heavy) in *Guṇa*, and *Śīta* (cooling) in *Vīrya*.^[16] Each of these properties counteracts elements of *Anidra* pathology: the sweet, unctuous, and heavy qualities pacify *Vāta* and nourish the depleted *Dhatus*, while the cooling property mitigates

Pitta. Together, these attributes are held to calm the mind and restore the conditions under which sleep naturally occurs.

A specific classical endorsement is found in the *Dhara Kalpa*, which recommends *Ksheeradhara* for *Nidranāśa* and disturbances of memory—an unusually direct textual sanction for the use of milk in this indication.^[15]

Table 1: Common Shirodhara media and their Ayurvedic properties.

Dhara Dravya	Principal properties (<i>Rasa</i> / <i>Guṇa</i> / <i>Vīrya</i>)	Doshic action	Typical use in <i>Anidra</i>
<i>Ksheera</i> (milk)	<i>Madhura</i> rasa; <i>Snigdha</i> - <i>Guru</i> guṇa; <i>Sheeta</i> vīrya	<i>Vata</i> - <i>Pitta</i> shamana; <i>Kapha</i> vardhana	<i>Vata</i> - <i>Pitta</i> presentations; classically commended for <i>Nidranasha</i>
<i>Tila Taila</i> (sesame oil)	<i>Madhura</i> /Tikta; <i>Snigdha</i> - <i>Guru</i> ; <i>Ushna</i> vīrya	<i>Vata</i> shamana	<i>Vata</i> -predominant; most-studied medium
<i>Takra</i> (buttermilk)	<i>Amla</i> / <i>Kashaya</i> ; <i>Laghu</i> ; <i>Ushna</i>	<i>Kapha</i> - <i>Vata</i> shamana; <i>Grahi</i>	<i>Kapha</i> -associated, heaviness
<i>Jala</i> (water)	Neutral	Minimal doshic action	Comparator; resource-limited settings
<i>Kwatha</i> (decoction)	Properties of constituent herbs	Variable	Herb-specific indications

Set against other commonly employed media, *Ksheera* (milk) occupies a distinctive position (Table 1). *Tila Taila* shares the *Vāta*-pacifying, unctuous, and warming qualities and is the medium most frequently studied; however, its *Uṣṇa Vīrya* makes it less suitable in presentations where *Pitta* is involved. *Takra* is light and *Kapha*-reducing, and is favoured in conditions where heaviness predominates. *Jala* is inert, inexpensive, and often used as a comparator, while medicated decoctions (*Kwatha*) carry the specific properties of their constituent herbs.

Milk, by contrast, is theoretically well matched to the common *Vāta*-*Pitta* form of *Anidra*. In addition to its classical attributes, it offers practical advantages: it is inexpensive, universally available, and well tolerated—qualities that are particularly relevant for a therapy administered daily over one to two weeks.

Clinical Evidence: Liquid or Procedure?

If the *Dhāra Dravya* is selected to counter the pathology, one would expect different liquids to yield distinct outcomes. The comparative clinical evidence, though limited, does not clearly support this expectation.

In the largest comparison identified, 131 patients with *Anidra* were randomised to *Shirodhara* using milk

processed with *Bala* and *Śatāvarī* or with *Tila Taila*. Both groups showed substantial improvement, with overall relief of approximately 78–79% in each group, although the groups differed on some individual symptoms.^[13] A three-arm study comparing *Shirodhara* with plain water, *Aśhvagandhā* decoction, and *Tila Taila* likewise reported broadly similar improvements on the Athens Insomnia Scale,^[17] accompanied, in the six patients in whom they were measured, by reductions in serum cortisol and changes in electroencephalographic activity. The authors concluded that the contribution of the liquid medicament was small relative to that of the procedure itself.^[18]

Another three-group trial found that *Shirodhara* performed with milk, whether alone or combined with an oral herbal tablet, produced significant improvement in *Anidra*, although the tablet given alone also improved symptoms significantly.^[19] A recent review of the *Shirodhara* literature, however, concluded that its benefit reflects both the procedure and a pharmacological effect of the liquid used.^[20] Case reports similarly document meaningful reductions in insomnia severity with *Shirodhara*, though by their nature they cannot isolate the contribution of the medium.^[21]

Table 2: Summary of representative clinical studies of Shirodhara in Anidra.

Study (year)	Design	n	Intervention	Key outcome
Rani P et al. (2021)	Randomised comparative	131	<i>Bala-Shatavari Ksheera vs Tila Taila Shirodhara</i>	Both improved (~78-79%); similar overall relief, some symptom-wise differences
Pokharel & Sharma (2010)	Comparative clinical	30	Insomrid tablet / <i>Shirodhara</i> with milk / both	All three groups improved; change most marked with tablet plus milk <i>Shirodhara</i> (no between-group test)
Sain K et al. (2024)	Comparative clinical	3 groups	<i>Jala vs Ashwagandha Kwatha vs Tila Taila Shirodhara</i>	Comparable improvement; reduced cortisol, EEG change; liquid effect small
Uebaba K et al. (2008)	Randomised controlled	16	Robotic <i>Shirodhara</i> vs supine control (healthy)	Reduced noradrenaline; anxiolytic, sympatholytic effect
Thakur & Mittal (2025)	Case study	1	<i>Shirodhara</i>	Improved sleep quality; reduced symptoms
Wadhawa (2016)	Case study	1	<i>Himasagara Taila Shirodhara (+ Nasya)</i>	Improved sleep duration and quality

EEG, electroencephalography.

Two cautions must temper these observations (Table 2). First, the available studies are small, predominantly open-label, and reliant on subjective instruments. None employed polysomnography or actigraphy, and the potential for non-specific and expectation effects in a procedure as sensorily distinctive as *Shirodhara* is considerable. Second, the absence of significant differences between media in small trials provides only weak evidence for genuine equivalence, since such studies are underpowered to detect modest effects.

The evidence is therefore consistent with two possibilities that current data cannot distinguish: either the choice of medium truly matters little, or real differences exist but remain undetected due to methodological limitations.

Mode of Action

The mechanism by which *Ksheera Shirodhara* alleviates *Anidra* can be described on two complementary levels—the classical *Ayurvedic* and the modern neurophysiological (Fig. 1). Neither account is fully established, and what follows should be regarded as a coherent, testable proposal rather than settled fact.

Ayurvedic Perspective

In classical terms, *Anidra* is fundamentally a disorder of aggravated *Vāta* acting upon the *Manovaha Srotas* (channels of the mind). The warm, unctuous (*Snigdha*), and heavy (*Guru*) qualities of milk, delivered continuously over the forehead, counter the dry and mobile attributes of *Vāta*, while its cooling (*Śīta*) property mitigates associated *Pitta*. By nourishing *Tarpaka Kapha*—the subtype of *Kapha* located in the head that sustains the sense organs and the mind—and by stabilizing the *Manovaha Srotas*, the procedure is held to restore the predominance of *Tamas* and *Kapha* under which, according to *Charaka*, natural sleep arises. The site of application, the forehead between the eyebrows at the *Sthapani Marma*, is regarded as a sensitive locus whose steady stimulation quietens the mind. In this

idiom, *Shirodhara* acts through *Vāta–Pitta Śamana* and calming of the *Manas*.^[2]

Modern Neurophysiological Perspective

Modern physiology offers a convergent account (Fig. 1). The continuous, warm, rhythmic stream provides sustained thermal and mechanical stimulation to the forehead, a region richly innervated by the trigeminal nerve. This input is associated with a shift in autonomic balance away from sympathetic arousal toward parasympathetic dominance, and with reduced activity of the hypothalamic–pituitary–adrenal (HPA) axis, as suggested by decreases in serum cortisol reported after *Shirodhara*.^[18] A controlled study using a robotic *Shirodhara* system reported reductions in plasma noradrenaline and urinary serotonin excretion, together with an anxiolytic, sympatholytic effect consistent with diminished sympathetic outflow.^[22]

Because sleep and the HPA axis are reciprocally linked—elevated corticotropin-releasing hormone impairs sleep and heightens arousal—a fall in HPA-axis activity plausibly reduces the hyperarousal that sustains insomnia.^[23] Electroencephalographic changes have also been reported with the procedure,^[18] and a shift toward alpha and theta activity, the pattern of relaxed, drowsy wakefulness that precedes sleep, would fit this account. It has further been proposed that stimulation of the forehead is relayed through the thalamus and basal forebrain to modulate serotonergic and adrenergic systems central to sleep regulation.^[19] Where the *Dhāra Dravya* carries pharmacologically active constituents—as with *Bala* (*Sida cordifolia*), whose extracts modulate central monoamines in experimental models—a small additional neurochemical contribution cannot be excluded, though for a milk medium it remains minor and unproven.^[24]

An Integrated View

Set side by side, the two accounts align with striking economy (Fig. 2). The aggravated *Vāta* described in the classics corresponds to a state of sympathetic and

cortical over-arousal; *Vāta–Pitta Śamana* parallels a parasympathetic shift and falling cortisol; the nourishment of *Tarpaka Kapha* and the settling of the *Manovaha Srotas* correspond to restored serotonergic and GABAergic tone with thalamic relay; and the resulting *Tamas–Kapha* sleep state corresponds to the alpha and theta EEG pattern and to clinical sleep onset.

This convergence is the practical point: *Shirodhara* represents a mechanistically coherent, non-pharmacological option for *Anidra*, and milk is a defensible medium for its delivery—even though both the precise mechanism and the comparative value of the medium await confirmation.

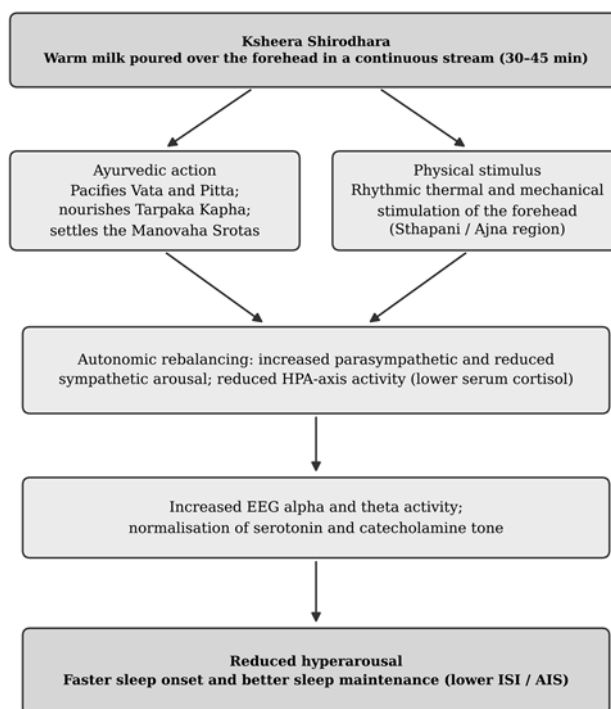


Fig. 1: Proposed mechanism of Ksheera Shirodhara in the management of Anidra.

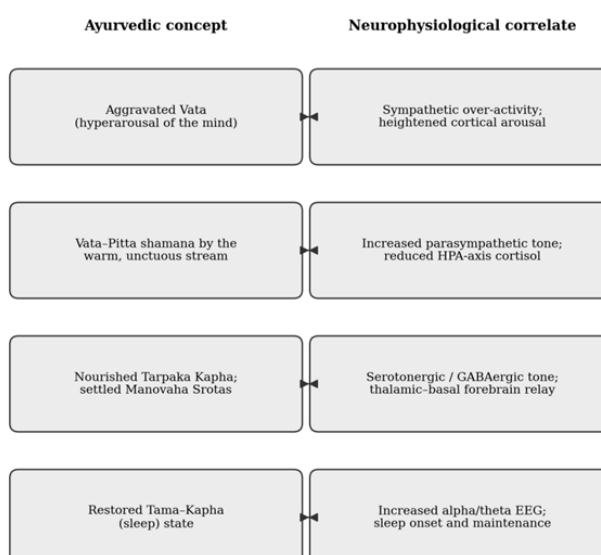


Fig. 2: Mapping of Ayurvedic concepts onto their proposed neurophysiological correlates.

DISCUSSION

Two conclusions emerge with reasonable confidence. *Shirodhara* appears to be a plausible and useful adjunct

in *Anidra*, consistently associated with improvement in subjective sleep across comparative studies, case reports, and reviews. Furthermore, milk is a defensible and

classically endorsed choice of medium for the common *Vāta-Pitta* presentation, offering practical advantages of cost, availability, and tolerability.

Caution is required, however, in claims of superiority. The available comparisons do not demonstrate *Ksheera* to outperform other media, and the most consistent signal in the data is that the procedure itself contributes more than the liquid. This is not an argument against using milk, but rather against over-specifying its role on the basis of current evidence. A constructive implication follows: if the procedure is the principal active element, then a simple, inexpensive, and well-tolerated medium such as milk is a rational default, with more elaborate medicated oils reserved for presentations in which their specific properties are indicated.

The principal need is methodological. Adequately powered randomised trials employing objective outcome measures such as polysomnography or actigraphy, validated subjective scales such as the Insomnia Severity Index, blinded assessment where feasible, and predefined equivalence or superiority hypotheses are required to determine whether the medium itself influences outcomes. A head-to-head comparison of *Ksheera Shirodhara* with a nasal *Vāta*-pacifying therapy would further help situate *Shirodhara* among external options for *Anidra*—a clinically relevant question that current work is only beginning to address.

LIMITATIONS

This review is narrative rather than systematic, and the literature it draws upon is itself limited. Much of the clinical evidence is published in journals not indexed in MEDLINE, is open-label and small in scale, and employs heterogeneous, largely subjective outcome measures. Formal risk-of-bias appraisal and meta-analysis were therefore not undertaken. The classical interpretations offered here represent one reading of texts that admit of others. Conclusions should thus be regarded as provisional and hypothesis-generating.

CONCLUSION

Ksheera Shirodhara rests on a coherent classical rationale: the sweet, unctuous, and cooling qualities of milk oppose the *Vāta-Pitta* pathology of *Anidra*, and the *Dhara Kalpa* specifically commends its use for *Nidranāśa*. Contemporary clinical evidence supports *Shirodhara* as a helpful, well-tolerated intervention for insomnia but does not establish that milk is superior to other media; if anything, it suggests that the procedure itself is the dominant active element. Milk can therefore be recommended as a sound, economical default medium, while the question of whether the *Dhāra Dravya* independently alters outcomes awaits the rigorously designed trials that the field now requires.

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