



## Review Article

www.ijrap.net

(ISSN Online:2229-3566, ISSN Print:2277-4343)



### A REVIEW ON ANALYSIS OF THERAPEUTIC PROCEDURE OF SHIRODHARA AND ITS PROBABLE MODE OF ACTION

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Received on: 28/08/21 Accepted on: 30/10/21

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DOI: 10.7897/2277-4343.1206174

#### ABSTRACT

*Shirodhara* is one of the four types of *Murdha Taila*, which involves a continuous impact of medicated oil due to gravity flow from a *dhara* pot at the height of 4 *angulas* through a wick on the forehead of the subject at a controlled temperature for a prolonged duration (approx. 30-45 min.). In today's era, unhealthy lifestyle, stress, and anxiety lead to many problems like insomnia, headache, facial paralysis, scalp psoriasis, hair fall etc. There is a need for time to find out the safe and effective treatment modalities to combat these challenges from the treasures of *Ayurveda*. In *Ayurveda*, many *Samhitas* have mentioned procedural outcomes, but their mode of action is not mentioned anywhere. So a review study was conducted, and various *Samhitas*, *Nighantus*, research papers, scientific journals, and modern books were considered.

**Keywords:** *Shirodhara*, *Murdha Taila*, mode of action, *marma*

#### INTRODUCTION

In *Ayurveda*, *Snehana* (oelation) is the major preparatory procedure to be performed before *shodhana* (detoxification process). *Acharya Charaka* has defined *Snehana* as the treatment, which produces viscosity, softness, solubility and *kleda* in the body<sup>1</sup>. *Snehana* is of two types i.e. *Abhyantra* (internal) and *Bahya* (external) *Snehana*. *Sneha* is administered externally by *Abhyanga*, *Murdha taila* etc. and internal by *pana*, *basti*, *nasya* etc. *Murdha Taila* belongs to the external application of oil and refers to applying the oil to the head. This is also known by the name *Shirastarpana*. It has four varieties- *Abhyanga*, *Seka*, *Pichu*, *Basti*. These are superior in their next order<sup>2</sup>.

*Shirodhara* or *Shiroseka* is a type of *Murdha taila* (Application of oil to the Head/ scalp), in which prescribed medicated oil liquid is continuously poured over the forehead and then allowed to flow over the scalp from a specific height for a certain period.

**Synonyms:** *Dhara*, *Parisheka*, *Vasheka*, *Sechana* –*Sinchana*, *Prasechana*

**Indications:** It is indicated in almost all stress and psychosomatic disorders such as Irritable Bowel Syndrome, Asthma, Neurological disorders like headaches, epilepsy, and psychiatric disorders like psychosis, neurosis, insomnia etc.<sup>3</sup> Other indications include *Vata* related disorders- Cerebral palsy, Facial palsy, Headache, Cervical Spondylitis, Eye diseases of neurological origin, Anxietyanxietyopathy etc.

**Contraindications:** *Kaphaj* disorders, lesion in the brain, Glaucoma, Fever, Conjunctivitis or any type of inflammation of the head.

#### Method of *Shirodhara*

The procedure of *Shirodhara* may be divided into three stages for the descriptive purpose:

*Purvakarma*  
*Pradhankarma*  
*Pashchatkarma*

***Purvakarma:*** It starts with the preparation of the patient. First, it should be confirmed whether the patient is fit for *shirodhara* or not. For better results, with the patient's permission, the patient's hair on the scalp should be removed. The patient should lie supine on the *droni*- with a pillow under the neck, and the *dhara*patra should be placed about four *angula* above his head. The eyes and ears should be covered with cotton so that liquid may not enter the eyes. The patient's head is to be massaged with a suitable oil, whereas in some cases, a whole-body massage is done before *Shirodhara*.

Following materials are required for *shirodhara*:

***Droni:*** For *shirodhara* a particular type of table is used, made up of wood with raised edges on all four sides so that the oil/liquid may not flow out, whereas, at the head end, oil poured is collected in another vessel for reuse purpose, if needed.

***Dhara Patra:*** It is a vessel in which liquids used for *shirodhara* are put in and is prepared from brass, steel, clay etc. It should be suspended above the head end of *shirodhara droni* with the help of a solid wire to enable liquid to fall from the proper distance.

***Aushadha* (Drug):** The drug should be selected according to the disease in the form of *Taila*, *kwath* etc. Gauze, cotton earplugs, vessels containing liquid, soft towels, attendants.

**Pradhan karma:** The temperature of the selected liquid should be *sukhoshana*, near the body temperature. It is then kept in the *dharapatra* and is poured continuously and slowly on the patient's forehead. The attendant should give a mild oscillation to both sides of the forehead to maintain the flow all over the head. The oil/liquid poured is recollected in the vessel, kept below the table, reheated to body temperature, and again poured in the *Dhara patra*.

**Shirodhara kala:** Generally, *Shirodhara* is done for about 30-45 minutes. But according to *Dharakalpa*, it is given according to *dosha* of patient- patient having *rukshta* (dryness) and *Pittanubandhit Vata*, it is to be given for 2½ *prahara* or two *prahara*. At the same time, in *snigdha Kaphanubandhit Vata*, it is one *prahara* or up to initiation of perspiration<sup>4</sup>. The treatment may be carried on daily for 7 to 14 days, according to the nature of the disease and the patient's physical condition. It is generally done in the morning hours, preferably on an empty stomach.

#### Period for Changing the Liquid<sup>5</sup>

Type of Drug used	Duration
Milk	Everyday
<i>Dhanyamla</i>	After three days
Oil	After three days

In the first three days, half of the oil is used, for next three days later half of its used and on the 7th day all the first and second half are mixed, then it should be discarded.

**Pashchatkarma:** After this process, the oil/liquid from the head is to be wiped off with a piece of clean cloth. For drinking purposes, warm water boiled with *dhanyajirka*, ginger and cumin seeds may be used. For washing and ablating purpose, only warm water should be used.<sup>6</sup> Patient should rest for some time and follow *pathya* up to 7 days.

#### Analysis of probable mode of action of *shirodhara*

**Analysis in Ayurvedic Science:** *Acharya Charak* quoted *Shira* as *Utamanga*, i.e. supreme, essential and significant part of the body where *prana* (life) and *indriyas* (sense faculties) resides<sup>7</sup>. In contrast, *Acharya Vagbhata*<sup>8</sup> has compared the human being to a tree with the roots at the top and branches below. He defined the head as the root of the tree where all *indriyas* and the *prana* reside. Just as the roots of a tree nurture and control all the tree's activities and well-being, the head is the operational centre of the entire body. Also, *Acharya Charka* has mentioned that all the *Indriyas* and *Pranavaha Srotas* depend on the *Shira* for their functions and all the sense organs and the channels carrying the sensory and vital impulses from the *Shira* are like the rays from the Sun<sup>9</sup>. Thus it is supreme of all organs, as consciousness is present. Hence, it requires prime protection<sup>10</sup>. It controls the function of the brain and spinal cord. *Shirodhara* has a relaxing effect on the brain and the whole nervous system. It relaxes & revitalizes the central nervous system cells, balances the hormonal functions, and thus regularizes and relaxes all the functions of the body.

**Effect on governing dosha's:** The chief governing *Doshas* in the head are *Prana Vayu*, *Sadhak Pitta* and *Tarpaka Kapha*. The seat of *Sadhak Pitta*, a subtype of *Pitta dosha*, is considered the *hridaya*, which means 'heart'. In *Ayurveda*, *hridaya* encompasses both the heart and brain. So the head, which houses the brain, also becomes a seat of *Sadhak Pitta*. Through the respective nerve centres in the brain, the head also controls the sense of hearing, smell, taste, and sight. Since the three *doshas* are represented in the head region, any vitiation in the *dosha* can cause respective disorders with widespread repercussions in the whole body. The

integrity of the functioning of these three sub *dosha's* is the key to perfect body-mind health, and imbalance or vitiation of one or more of these three factors will lead to many psychosomatic diseases. Here, through the use of various mediums like oils, ghee and buttermilk, *Shirodhara* pacifies these *doshas* and works on the entire body indirectly. *Shirodhara* will strengthen the head region so that the whole body works smoothly<sup>11</sup>.

**Effect on Marmas:** Head and forehead region is the region of some vital *marmas* (vital spot). *Sthapni*, *Utshepa*, *Apanga*, *Avarta*, *Shankha* and *Adhipati Marma*<sup>12</sup>. Most of these *marma's* are related to the eye and blood circulation to the brain.

**Sthapni Marma:** The location of *Sthapni marma* is situated at the midpoint between the eyebrows. Anatomically, this area is identified as the starting point of superior sagittal and cavernous venous sinuses, which are a venous reservoir of the brain and, due to nourishment of this *marma*, structures associated behind and with it get proper nutrition. The pituitary and pineal gland site exists at the same level of *Sthapni marma*. The pituitary gland is a shaped like a bean and lies at the base of the skull behind the nose. This tiny gland relays messages from the hypothalamus to all the body's endocrine glands; therefore, it is often called the master gland of the body. The stimulation of *Sthapni Marma* by making the patient concentrate on this area during *shirodhara* and indirect stimulation of the pituitary gland brings psychosomatic levels. Hence, *Shirodhara* helps relieve mental stress by bringing the pituitary gland hormones in balance and regulating the normal function of this gland<sup>13</sup>.

Following are other *marmas* which get affected by *Shirodhara*

**Utshepa marma:** It can be taken as temporal muscle and temporal fascia, which form the temporal fossa's base and roof, respectively.

**Apanga marma** lies at the outer side of the eye and below the distal end of the eyebrows, whose nearby anatomy can be correlated to the lateral wall of the orbit and the structures associated with it. So *shirodhara* is helpful in eye-related diseases also.

**Avarta marma:** It is situated on the upper side of eyebrows below hair margins, anatomically located on both sides of superciliary arches and its underlying structures, i.e. frontal sinus.

**Shankha marma:** It corresponds to the skull's temporal bone underneath which lies the temporal lobe of cortex arterial branches, superficially lies the superficial temporal artery, and deep middle meningeal artery is situated. At the base, there is also some of the important structures of the brain.

**Adhipati marma:** *Adhipati marma* is situated inside the cerebrum on its upper side. It is a group of vessels like the circle of hair (*avarta* of hair). This can be taken as a circle of Willis's (Circulus arteriosus). It lies in the interpeduncular fossa and supplies nutrition to the cerebral hemispheres.

So, stimulating the *marmas* of the forehead and head improves the blood circulation of that particular area, thereby removing the pathology in the structures within and around the *marmas*. Moreover, the lukewarm medicament used in *Shirodhara* causes vasodilatation of all channels of the head and forehead region, specifically around the structures (mentioned above) associated with *marmas*, which again, in turn, improves the blood circulation of the brain. This, in turn, enhances the function of higher centres in the brain and substantially impacts the functioning of the central nervous system and essential glands within the brain.

**Analysis in Yoga Science:** In *Hath Yoga Pradipika*, an ancient *yogic* text, it is mentioned that there are 72000 *nadis* present within the body, all believed to extend out from the spinal cord. Like two rivers intersecting at a point, creating power and spinning energy accumulation. Where *nadis* connect forms a wheel of energy or a *chakra*, so *chakras* are the areas of energetic clusters or an accumulation point of those energies in the subtle body. They are 7 in numbers. Out of thousands of *nadis*, three significant *nadis* (*Sushumna*, *Ida* and *Pingala*) intersect where each of the seven *chakras* is. Out of 7, *ajna chakra* (Brow or third eye chakra) is the sixth *chakra*, which is in the third eye area, which is found in the space between the eyebrows. It is located in the pituitary gland, directly behind the centre of the forehead. This *chakra* is mainly associated with both the pituitary and pineal gland. The pituitary is sometimes referred to as the “master gland” because its secretion activities control the functions of the other glands. Like the conductor of an orchestra, it establishes the harmonious interaction of the other glands<sup>14</sup>. Melatonin is produced by the pineal gland, controlling our circadian rhythms and reproductive hormones. This makes the pineal a master regulator of time, affecting our sleep patterns and our sexual maturation. More than just sleep-regulating, the melatonin release also affects our stress and ability to adapt to a changing world<sup>15</sup>.

The third eye or pineal gland is activated through meditation. This *chakra* controls and energizes the pituitary gland, the endocrine glands and the brain to a certain extent. It also influences the primary *chakra* or *Mooldhara chakra* and is the master *chakra* as it directs and controls the major *chakras*<sup>16</sup>. So when the patient meditates on *Shirodhara*, it enhances the power of *Ajna Chakra*; thereby, it regulates the function of other *Chakras*, which helps bring the hormonal balance and other body functions.

**Analysis in Modern Science:** Various research papers have postulated the mode of action of *Shirodhara*. The probable mode of action of *Sirodhara* is elicited below as<sup>17</sup>.

- A. Procedural effect of the process.
- B. The therapeutic effect of medication

**Procedural effect of the process:** To discuss the Procedural effect of *Shirodhara karma*, it is divided into three steps effects.  
Penetration  
Stimulation  
Relaxation

**Penetration:** When *Shirodhara* is performed by using *sneha, jal* etc., it flows as *dhara* on the forehead of the patients. It sticks a little bit on the forehead, consisting of some vital centres such as *Agya Chakra* and *marmas* of the forehead and head region. Active ingredients in the medicine enter through the penetration in the skin of the forehead and scalp region. The Penetration power is dependent on the consistency and density of drugs. In his study, the author has concluded that *shirodhara* with oil (*Jatamansi Taila*) has greater penetration power than *Jala* (lukewarm water) as *Tila Taila* has a lipid constitution that can be penetrated easily through cell walls.

**Stimulation:** To reach the central nervous system, a drug must have a high degree of lipid solubility (high oil/water partition coefficient) or a specialized transport mechanism. After penetration, it can be said it stimulates Central Nervous System.

*Shirodhara* directly influences the release of melatonin which releases stress and induces sleep and is helpful in insomnia, anxiety, psychosomatic diseases etc.

According to modern physiology, drugs may act directly on neurons and modify neuronal functions.

They may act reflexly by sending afferent impulses to the central nervous system via the chemoreceptors, baroreceptors, and peripheral nerves, thereby eliciting psychic, somatic or visceral responses.

They may affect the nutrition and oxygen supply of the Central Nervous System. by altering its blood supply or affecting its metabolism.

**Relaxation:** In *Shirodhara*, patients feel peace both physically and mentally. Relaxation of the frontalis muscle tends to normalize the entire body and achieve a decreased activity of the Sympathetic nervous system with lowering of brain cortisone and adrenaline level; synchronizes the brain wave (alpha waves) strengthens the mind and spirit, and this continues even after the relaxation.

Whether *Shirodhara* directly influences the release of melatonin – a hormone responsible for inducing sleep requires further studies. Moreover, a supine position also helps in relaxation.

It is known that the pituitary gland is the master gland of the endocrine system, which stress response, anxiety; *Shirodhara* regulates functions of the neuroendocrine system by its penetrating effects and causes relaxation at all levels.

**The therapeutic effect of medication:** Absorption of the drug (medicine) depends upon several factors. Some of the most important is concentration, duration of contact, the solubility of medication and physical condition of the skin and part of the body exposed. In *Shirodhara*, oil form is used with good dense concentration and a longer duration of contact. The skin is relatively permeable to fat-soluble substances and relatively impermeable to water-soluble substances. These fat molecules can pass through the stratum corneum (the outer layer of the epidermis). From here, the oil molecule passes through the dermis into the capillaries and the bloodstream. Absorption also occurs through the hair follicles and sweat ducts. Many factors affect the absorption of an oil molecule. Both rates of circulation and the warmth of the skin increase blood flow to the surface, therefore increasing the skin's ability to absorb the oil. Circulation and heat can be increased by massage, i.e. mild *Abhyanga* during *Shirodhara*.

The larger the covered area of skin, the more oil will be absorbed. The skin's permeability is also a factor, and thinner skin, e.g. skin behind the ears and the inside of the wrists, is very porous. Similarly, the palms of the hands and feet, armpits and scalp will more readily absorb oil molecules than the arms, legs, belly, back etc. That is why medicated oil gets maximum absorption through scalp skin into the main blood stream<sup>18</sup>. *Ayurvedic* practitioner Ed Danaher explains how *Shirodhara* affects stress.<sup>19</sup> (Fig.1)

During *Shirodhara* the stream of oil creates certain amount of pressure and vibration over the forehead  
⇓  
Vibration amplified by the hollow sinus present in the frontal bone  
⇓  
Vibration transmitted inwards via fluid medium of CSF  
⇓  
Vibration along with little temperature of oil may activate the functions of thalamus and the basal forebrain  
⇓  
Brings amount of serotonin and catecholamine to the normal stage  
⇓  
Relaxes mind and induces sleep  
Also prolonged and continuous pressure due to pouring of the medicated liquid may cause tranquillity of mind and induce natural sleep.

So probable mode of action of *shirodhara* can be elicited below as:

*Shirodhara* has a relaxing effect on brain and whole CNS  
⇓  
As Pituitary and Hypothalamus are concerned glands for many physical and mental functions So when all these are relaxed, body function including heart functions work in a relaxed manner  
⇓  
Blood circulation and nutrients takes place in a proper way  
⇓  
Peripheral resistance is reduced  
⇓  
Channels of body opens up  
⇓  
Cells start flushing the toxins  
⇓  
Overall metabolism gets improved

## CONCLUSION

*Shirodhara* is a purifying and rejuvenating therapy designed to eliminate toxins and mental exhaustion and relieve stress and any ill effects on the central nervous system. It soothes the stressed and agitated mind and helps discharge toxins from the body. It keeps the body relaxed and healthy by keeping the mind calm and functioning correctly. Based on the above analysis of *Shirodhara* both in *Ayurveda* and in modern sciences, it is clear that it has both therapeutic and procedural effects. Moreover, the effect of *Shirodhara* can be best understood from the aspect of *Ayurveda*, *Yogic* and *Marma* science.

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**Cite this article as:**

Sheweta Kotwal and Deepak Pathak. A review on analysis of therapeutic procedure of shirodhara and its probable mode of action. *Int. J. Res. Ayurveda Pharm.* 2021;12(6):73-77 <http://dx.doi.org/10.7897/2277-4343.1206174>

Source of support: Nil, Conflict of interest: None Declared

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