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*Review Article*

## A Review on: Ayurveda in the Treatment and Management of Motor Neuron Disease

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### Abstract

Motor Neuron Disease (MND) is a devastating neurodegenerative disease with a poor prognosis and severe disability. Many potential external risk factors have been proposed as part of a gene-environment interaction in the etiology of MND. This result is also supported by current hypotheses concerning the cellular and genetic origins of MND. A motor neuronopathy that exacerbate Fronto Temporal Dementia is known as MND (FTD). Frontal and temporal neocortical atrophy induce severe personality changes, inappropriate social conduct, and executive difficulties in people with FTD. Motor neuron disease causes symptoms such as bulbar palsy and limb amyotrophy. Frontal executive function deficits are seen in MND/Amyotrophic Lateral Sclerosis (ALS) patients who are not considered demented. Furthermore, MRI has revealed anomalies in the frontal lobe. MND, according to Ayurveda, are caused by Vata Dosha. Vata oversees the nervous system's autonomic, peripheral, and central functions. It oversees the brain's cognitive and neurological processes. This article gives the information about the Ayurveda in management of MND, Panchakarma treatments for MND, various herbs and herbal formulations like Ashwagandha, Brahmi, Gotu kola, Shilajit, Kapakacchu, Medhya churna used in the treatment and management of MND.

**Keywords:** MND, FTD, Physical activity, Ayurveda, Panchakarma.

### INTRODUCTION

Motor neuron disease is the slow degeneration of upper and lower motor neurons" (MND). The name "amyotrophic lateral sclerosis" was coined by Jean-Martin Charcot in 1874 to describe the disease (ALS). The most common type of the disease is now known as ALS, and the terms are frequently interchanged with MND." (Swash M., 2001) "Muscle atrophy or weakness in one or more limbs or bulbar areas is a symptom of Amyotrophic Lateral Sclerosis (ALS)." (Talbot K., 2002) "A combination of upper and lower motor neuron loss leads to widespread muscle weakness. MND start age, location of onset, and rate of progression are all highly variable, with each of these factors having a significant impact on life expectancy." (Swash M., 2001).

"For a long time, it was thought that classic motor neuron disease/amyotrophic lateral sclerosis (cMND/ALS) spared cognitive abilities. However, there are multiple historical allusions to behavioral problems in MND, as well as descriptive language like schizophrenia and dementia. FTD/MND syndrome is significant because it has the potential to provide insight on the evolution of symptoms in FTD due to its slower progression. It refers to the early cognitive and anatomical changes that occur in FTD prior to the illness spreading and secondary degenerative processes." (D. Neary, et. al, 2000).

### AYURVEDA IN MANAGEMENT OF MOTOR NEURON DISEASE

Medicinal plants refer to a set of plants with a mixture of several ingredients that have therapeutic values. Human

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kind tends to utilization these kinds of plants hopefully to be safer (Karunamoorthi et al., 2013). Medicinal plants have gained attention today especially in the developing countries which depend on their efficacy in health care and treatment of various diseases.

### Medicinal Plants as Alternative Medicine

Ayurveda defines health as a state in which the physical body, senses, and psyche are in their original or natural state in terms of body and function Coughlan et al., (2016). Vata is thought to be the most important component in the body's physiological upkeep. The central, autonomic, and peripheral neural systems are all controlled by the vata bio-factor Devade et al., (2022). The respiratory, circulatory, lymphatic, excretory, and reproductive systems, as well as all forms of movements, are all under Vata's influence. It's also in charge of the brain's cognitive and neo-cognitive functions, as well as the secretion of chemical neurotransmitters and hormones. Vata's functions are like those of the central, peripheral, and autonomic nervous systems Charles & Swash (2001).” (Charaka the Speciality Ayurveda Institute of Panchakarma & Research, 2022).

Here are a few characters of Vata, According to Sanskrit theory, these explain more about the Vata dosha's connection to motor neuron illness. They are as follows.

- The initiation of every activity depends on the Vata Motor commands fall under this activity of the Vata Dosha
- The initiation of all motor activities, Guides to the movements, Binds the body together.
- Keeps the body intact, Responsible for Vata Dosha.

**The approach of Ayurvedic Treatment for MND:** The major goal of MND treatment is to slow the disease's progression and prevent the body from decaying John et al., (2020). Life is not like the condition

**To stop the further decay of the nerve cells:** For the treatment of this condition, two points approach for MND is used Mitra et al., (2002).

besides, lack of information, drug standardization, and quality control. So, Awareness of using medicinal plants and knowing more about their causative and curative effects is very necessary in order to avoid any side effects that may happen Mridula & Aswathi (2016). Eventually, knowing medicinal plants components and their role as curative for many various diseases increase the potential discovery of new drugs Nandigoudar (2021).

### Detoxification of Body

The first step is to eliminate the body's deep-seated poisons. Toxins may come from the environment may be present as a

result of a "genetic arrangement of the body." This is when Panchakarma comes in. We are unable to perform substantial panchakarma on MND patients Sharma (2021). Because there is too much deterioration in the body of a person with motor neuron disease. As a result, he makes excellent use of medicines and panchakarma Sharma et al., (2019).

### Rasayana Therapy

Rasayana is the nourishing medicine. These are extremely nourishing to the body. These can range from simple combinations like Ashwagandha Amala and Mulethi to more sophisticated ones like Brahmarasayans or Chyawanprash Uchechi et al., (2020). It is up to the doctors to choose the appropriate medicine for the patient's condition

### Ensuring the proper nourishment of remaining cells:

Because the body's degeneration is rapid in MND, we must appropriately nourish the body. While addressing the therapy of Vata Vyadhi, Charak makes an insightful observation on the subject. Ghee, oils, animal fats, and bone marrow are all good sources of nutrition. These can be applied to the skin, as well as taken orally and through Basti. Foods that are sweet, salty, and sour that nourish the body are advised Ven Murthy et al., (2010). Charaka had a vision and was aware of the treatment plan Waliwita (2021).

**To Help the Nourishment of Muscles:** Complete this stage by completing the previous one. Bruhman chikitsa aids in muscular deterioration and is damaging Zahiruddin et al., (2020). Panchakarma methods like Navar Kizhi, in addition to medicines, aid in this. (Vaidya Pradeep's Sukhayu Avurveda, 2022).

### Panchakarma Therapies Quite Effective in MND (Figure 1)

**Abhayandam:** “The Ayurvedic oil massage is an important aspect of the Ayurvedic healing system's daily regimen for total health and well-being. Traditional Ayurvedic scriptures are quite eloquent on the advantages Zahra et al., (2022). Here's what one person says: Every day, give yourself a full-body oil massage. It nourishes all parts of the body, pacifies the doshas, relieves exhaustion, offers stamina, pleasure, and perfect sleep, improves the complexion and luster of the skin, promotes longevity, and nourishes all doshas” (Figure 2).

### Benefits:

- “Increased circulation, especially to nerve endings, toning of muscles and the whole physiology, calming for the nerves, Lubrication of the joints
- Softer, smoother skin, Better, deeper sleep at night
- Increased mental alertness, Improved elimination of impurities from the body”



Figure 1: Panchkarma Therapy (Deep Avurveda For Healthy Living, 2018-2021).



Figure 2: Abhyanga (Ayurveda Resort Mandira, 2022).

“Abhyanga allows for transdermal absorption of the healing characteristics of the massage material, and it aids the skin, the body's largest organ, in performing its many duties, such as allowing toxins to be removed from the body or allowing nutrients to be absorbed by the tissues. It's similar to oiling your car's engine: if you do it on a regular basis, your engine will be in top shape and provide you with years of trouble-free service.”

“Herbal massage oils are made from a blend of herbs that have been carefully selected for their potential to enhance the physiology and calm the mind.”

**Shirodhara:** “Shirodhara is an ancient method of Ayurvedic therapy that has been used for over 5000 years. It entails a steady flow of heated herbalized oils across the forehead, focusing on the third eye (the chakra points immediately above and between the brows). It's thought to be the origin of human awareness). The oils are allowed to flow over the scalp and through the hair, giving a relaxing experience as you lie on your back with your body cocooned in warm towels above you” (Figure 3).

“Your head will be placed beneath the oil ‘fountain’, which is a metal bottle with a slow-flowing nozzle from which the oils will gradually drip onto your forehead. All ailments,

according to Ayurveda, are caused by an imbalance of energy in the body. Ayurveda uses purification therapy to cleanse the body and restore the balance of life force through rejuvenation to treat ailments. Shirodhara treatment is a rejuvenation technique that is known for calming and repairing an overworked nervous system.”

#### Benefits:

- “Produces a deep state of relaxation in the body and mind, reducing tension.
- Nervous system stabilizer, it aids in the treatment of insomnia, Rejuvenation and purification of the body and mind, Restores skin's natural shine and youthfulness by replenishing skin oils.
- Activates the pituitary, pineal glands, and hypothalamus, all of which organise and regulate the body's hormones.
- Assists in the production of endorphins, the body's neurotransmitters, it stimulates the senses, Encourages a cheerful outlook on life.
- Brings spiritual consciousness to the third age, increases intuition and stimulates cognitive memories.

- Improves focus, mental clarity, and comprehension and stimulates the pituitary gland, which is responsible for the activation of sexual and reproductive hormones.
- Clears the mind, relieves stress, and relaxes the face muscles, softening lines and wrinkles.
- Nourishes the hair and scalp, as well as the hair follicles, to prevent hair loss and greying.”

**Nasyam:** “Nasya, often known as nasal drop, is a popular Ayurvedic remedy. It's one of the treatments utilized in Panchkarma, Ayurveda's detoxification or cleansing procedure. Nasya is the practice of injecting oil or other substances into the nostrils in a controlled manner. In some circumstances, it can also be done with powder. Nasya is a very effective and promising procedure for disorders of the ear, nose, and throat. When done on a regular basis, it has a positive impact” (Figure 4).

**Benefits:**

- “Nasya, as a therapeutic therapy, offers astonishing results in the treatment of head problems. The nostrils, according to Ayurveda, are the entryway to the brain. Nasya is used in the treatment of problems with the head, neck, brain, eyes, ears, nose, and throat.”
- “Nasya aids in the removal of toxins and doshas from

the area above the collarbone, resulting in enhanced blood circulation, which nourishes the cells and alleviates connected diseases. Nasya is used to treat facial paralysis, stroke, cervical spondylitis, various headaches, lock jaw, sinusitis, epilepsy, and illnesses of the sensory organs in this way. According to recent research, nasya stimulates the pituitary gland, which can help with hormonal imbalances”.

**Pizhichil:** “This Ayurvedic massage combines two traditional Ayurvedic treatments. Swedana (oleation) and Snehana (sudation). The entire body is drenched in warm herbal oil streams while being massaged at the same time. Warm oil and massage open pores, allowing the herbal oil to go deeper into the tissues.”

“The treatment is applying medicated lukewarm oil to the affected areas and rubbing them for 45-60 minutes. By squeezing a cloth soaked in oil from a vase, the oils are spilled on the body. The essential oils used in this therapy are chosen precisely for your dominant energy body constitution type. For optimal effects, the therapy should be done for 7-14 days.” (Figure 5)

**Benefits:**

- “Pizhichil relieves muscle and joint pain, it is anti-aging in nature.



Figure 3: Shirodhara (Ayurved Multispeciality Hospitals, 2022).



Figure 4: Nasya (Mangisteen Ayurveda and Wellness Resort, 2002-2022).

- Blood circulation is improved, it increases muscle development.
- This improves the appearance of the skin.
- It aids in the treatment of diabetes, hypertension, asthma, and even tuberculosis in its early stages, it is a peaceful and relaxing therapy.
- This therapy is quite energizing, it relieves the body's burning sensation.”

**Shashtika shali pinda swedan:** “One of the most important swedana (sweat-inducing) treatments is Navarakhizhi. It can be used to treat chronic vata disease, sleeplessness, multiple sclerosis, paralysis, muscle weakness or stiffness, joint illness such as osteoarthritis, and other degenerative disorders, or as a rejuvenation and anti-aging treatment for healthy people. It slows down the ageing process by preventing premature greying of the hair, hair loss, and wrinkles” (Figure 6).

“The heated medicinal rice puddings made with Ayurvedic herbs are applied in the shape of boluses knotted in a cotton cloth after the administration of medicinal oil over the entire body. The bundles are warmed in a decoction of herbs and cow's milk on a regular basis. Heat and pressure are administered to the body at the same time during the therapy massage, providing sustenance to the muscles and nerve endings. It relieves joint stiffness and cleans the

bodily channels, allowing for greater blood circulation and the removal of waste items from the body. It improves the appearance of the skin, promotes a healthy digestive system, and restores vitality.”

### Herbs and Herbal Compounds Used in Mnd

**Ashwagandha:** “As a Rasayana, *Withania somnifera* (Ashwagandha) is a highly valued herb in the Indian Ayurvedic system of medicine (tonic). It's used for a variety of ailments, but most notably as a nervine tonic. Many scientific investigations were conducted in light of these findings, and its anti-stress effects were thoroughly investigated. It has also been discovered to be beneficial in the treatment of neurological illnesses. It has a GABA-mimetic action and has been proven to increase dendritic development. Ashwagandha also increases nerve cell communication and boost the body's ability to recover nervous system damage” (Figure 7).

**Ashwagandha Capsules:** “These are pure natural capsules that are obtained from *Withania somnifera* (Ashwagandha). It is the most commonly herb used in Ayurveda which works on the nervous system as it possesses natural rejuvenating properties. It is helpful in relieving all types of nervous related disorders like MND. This herb works on the non-specific basis to normalize the physiological functions by working on neuroendocrine system. (Figure 8)



**Figure 5:** Pizhichil (Pizhichil Treatment, IndiaMART, 1996-2022).



**Figure 6:** Shashtika Shali Pinda Swedan (Dr. Monga Medi Clinic, 2019).



**Figure 7:** Ashwagandha (Tanya Malik, 2019).



**Figure 8:** Ashwagandha Capsules (Dabur Ashwagandha Capsules Immunity Booster-20 Capsules, 1996-2022).

**Dosage:** 1-2 capsules twice daily.”

**Brahmi:** “The herbal nutraceutical *Bacopa monnieri* (Brahmi) is known in Ayurveda for its role as a Medhya Rasayana or nootropic agent. *Bacopa monnieri*'s medicinal benefits are thought to be mediated by triterpenoid saponins found in the plant extract. Bacosides are the most important triterpenoid saponins. It's been proven that they improve nerve impulse transmission. By upregulating neuronal synthesis and kinase activity, the bacosides aid in the healing of injured neurons. The bacosides also aid in the restoration of synaptic activity, which leads to the transmission of nerve impulses. Nerve impulse transmission is essential for healthy cognitive functions such as attention span, focus, concentration, learning, and memory” (Figure 9).

Brahmi Capsules

“Brahmi Capsules are made from the herb Brahmi's pure extract. The herb Brahmi is used to balance the Pitta and Kapha doshas in the body. It relieves symptoms such as stress, headaches, anxiety, and brain difficulties, as well as keeping the mind peaceful and relaxed. Bacosides, an active molecule found in it, aids in the regeneration of brain cells. Taking Brahmi pills for longer periods of time is not harmful. It is beneficial to the neurological system. This herb is also beneficial to the lymphatic, nervous, blood, urinary, circulatory, and digestive systems. It is utilized to help the body's general strength and energy levels. (Figure 10)

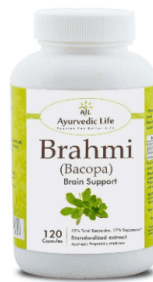
**Dosage:** 1-2 capsules twice daily” (Dr. Vikram Chauhan, 2020)

**Kapakacchu:** “*Mucuna pruriens* (Kapakacchu) is a powerful nerve tonic. It's a natural L-Dopa supplement that boosts the body's Dopamine levels. Dopamine levels must be kept at a healthy level for smooth sensory function and mental agility. It soothes the senses and helps to alleviate anxiety and stress. Nerve conduction is thought to be improved by increased dopamine levels. It controls mobility abnormalities that are common in neurodegenerative illnesses in a natural way. The medication has a strong vata-pitta hara effect. Rigidity, dryness, roughness, loss of function, and a tingling sensation in the body are all signs of an overactive vata. The unsteady vata is grounded and stabilized by Kapikacchu. It calms the nervous system and gives you more energy” (Figure 11).

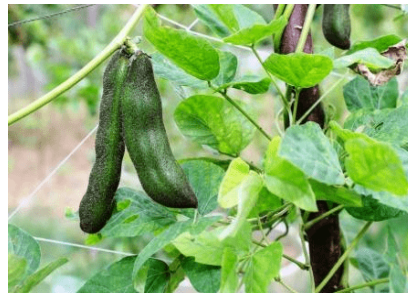
**Gotu kola:** “*Gotu kola* (*Centella asiatica*), also known as Indian or Asiatic pennywort and endemic to Asian wetlands, is regarded the most rejuvenative herb in Ayurvedic medicine and is used as both a medication and a vegetable. Essential oils, tannins, plant steroids, amino acids, flavonoids, oligosaccharides, and triterpenoid saponins, such as asiaticoside, madecassoside, and madasiatic acid, can all be found in *Gotu kola*. It is filled of vitamins and minerals. *Gotu kola* promotes cognition and memory while supporting proper neurotransmitter activity. It also improves mental performance and protects the brain from degenerative diseases. It enhances brain circulation, protecting it from



**Figure 9:** Brahmi (Ryan Raman, 2019).



**Figure 10:** Brahmi Capsules (Ayurvedic Life Brahmi Capsules 300mg Capsules, Natural, 120 count, 1996-2022).



**Figure 11:** Kapakacchu (Kapakacchu- Mucuna Pruriens Benefits, Dose, Side effects- Ayurveda, 2022).

oxidative damage and lowering the likelihood of developing degenerative brain diseases. Gotu kola boosts GABA levels in the central nervous system, which has a soothing effect by lowering anxiety. It also helps the body's ability to adapt to temporary stress by lowering cortisol levels and assisting with stress management. Gotu kola increases collagen formation and synthesis by stimulating circulation. It has a beneficial effect on the walls of blood vessels" (Figure 12).

**Gotukola Capsules:** "Gotukola Capsules are made from a pure extract of the *Centella asiatica* herb. This herb promotes healthy blood circulation, a healthy brain, and the equilibrium of the body's three doshas: Vata, Pitta, and Kapha. The herb gotukola aids in the relaxation of the central nervous system and the slowing of the ageing process. (Figure 13)

**Dosage:** Two capsules twice daily after meals" (Dr. Vikram Chauhan, 2020)

**Medhya Churna:** The product medhya churna is described

as a natural brain supplement that helps to reduce anxiety and boost memory. It is a completely natural composition made up of natural herbs with beneficial medical characteristics. It is a great brain and nerve tonic that helps to revitalize the nervous system.

### Ingredients

Vacha (*Acorus calamus*): 50 gm, Ashwagandha (*Withania somnifera*): 5 gm, Ajmoda (*Carum roxburghianum*): 5 gm, Shwet Jeerak (*Cuminum cyminum*): 5 gm, Krishna Jeerak (*Carum carvi*): 5 gm, Sonth (*Zingiber officinale*): 5 gm, Marich (*Piper nigrum*): 5 gm, Pipali (*Piper longum*): 5 gm, Patha (*Cissampelos pareira*): 5 gm, Shankhpushpi (*Convolvulus pluricaulis*): 5 gm, Brahmi (*Bacopa monnieri*): 5 gm

**Dosage:** 1 tsp. of powder twice daily or 5 grams twice daily (Dr. Vikram Chauhan, 2020)



**Figure 12:** Gotu kola (Ogunka-Nnoka Charity Uchechi, et. al, 2020).



**Figure 13:** Gotu kola Capsules (Gotu kola, Himalaya Wellness Latvia SIA, 2021).

## CONCLUSION

Despite tremendous advances in our understanding of MND pathophysiology in recent years, the clinical benefits to patients have been negligible. The problem of figuring out what causes this lethal sickness is yet unresolved. The available data on PA as a risk factor for MND is insufficient to draw clear conclusions because it is scarce, inconsistent, and of poor quality. Because of the kind and low prevalence of MND, many concerns have developed. The previously found positive association between MND and PA, on the other hand, has yet to be proven beyond a reasonable doubt, and it could reflect an abnormal physiological response to an external stimulus in genetically susceptible individuals. By this review article, we conclude that the Ayurveda has precious role in the treatment and managements of MND. Panchakarma treatment is also used in the MND treatments. Herbs like Ashwagandha, Brahmi, Gotu kola, etc. and their formulations like capsules, churna are used in the treatment of MND.

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