

Ayurveda for Cognitive Resilience in Ageing

1. SAKSHI SHARMA

P.G Scholar, Dept. of Panchakarma, Patanjali Bhartiya Ayurvigyan Evum Anusandhan Sansthan,
Haridwar

2. Vd. SHIVANI MAHAJAN

Professor Dept. of Panchakarma, Patanjali Bhartiya Ayurvigyan Evum Anusandhan Sansthan, Haridwar

3. SHIVANI SHARDA

PG Scholar Department of Prasuti Tantra Evum Stree Roga, Shri Dhanwantry Ayurvedic College and
Hospital, Chandigarh

4. Dr. PRIKSHIT SHARDA

BAMS, CKS Maa Sharda Hospital Nalagarh, Himachal Pradesh

5. Dr. AISHWARY SRIVASTAVA

P.G Scholar, Dept. of Panchakarma, Patanjali Bhartiya Ayurvigyan Evum Anusandhan Sansthan, Haridwar

Abstract-

Ageing is associated with a progressive decline in cognitive domains such as memory, attention, and executive functioning, often leading to neurodegenerative disorders like dementia. Contemporary neuroscience attributes these changes to neuronal degeneration, oxidative stress, and dysregulated neurotransmission. Ayurveda, with its holistic understanding, provides unique insights into preserving *Medha* (intellect), *Smriti* (memory), and *Manasika Bala* (mental strength). The concept of *Jara* (ageing) emphasizes timely adoption of *Rasayana Chikitsa* aimed at cellular rejuvenation and sustaining cognitive vitality. Classical texts recommend *Medhya Rasayanas*¹—*Mandukaparni* (*Centella asiatica*), *Yashtimadhu* (*Glycyrrhiza glabra*), *Guduchi* (*Tinospora cordifolia*), and *Shankhapushpi* (*Convolvulus pluricaulis*)—for enhancing neurocognitive resilience through antioxidant, neuroprotective, and adaptogenic properties. Clinical and preclinical studies indicate that Rasayana formulations like *Amalaki Rasayana* and *Guduchyadi Medhya Rasayana* significantly improve cognitive parameters in ageing individuals and models of mild cognitive impairment. Complementary therapies like *Abhyanga*, *Shirodhara*, and *Panchakarma*, along with *Balya* and *Brimhana* regimens, support nervous system nourishment and *Vata* pacification. This integrative Ayurvedic approach not only delays cognitive decline but fosters resilience against neurodegeneration. By aligning ancient Ayurvedic wisdom with modern neuroscience, the study underscores Ayurveda's potential in promoting healthy ageing and sustaining cognitive vitality throughout life.

Keywords: Ayurveda, Jara, Vata Dosha, Medhya Rasayana, Balya, Brimhana, geriatric care, cognitive resilience, ageing, Sandhivata, Smriti Hani, Swedana, Shirodhara.

Introduction:

Ageing is a universal biological process characterized by progressive physiological and functional decline across body systems, especially in the nervous system. Cognitive ageing manifests as diminished attention, learning capacity, working memory, and processing speed. Modern science associates this decline with oxidative stress, accumulation of β -amyloid plaques, mitochondrial dysfunction, and neuroinflammation, all contributing to neuronal loss and impaired synaptic communication.

In Ayurveda, ageing is described under the concept of *Jara* or *Vardhakya*, signifying the natural degenerative phase of life. It is marked by *Dhatukshaya* (tissue depletion), *Oja Kshaya* (vitality loss), and predominance of *Vata Dosha*. This imbalance affects *Manovaha Srotas* (psychological channels), leading to decline in *Medha* (intellect), *Smriti* (memory), and *Manasika Bala* (mental strength).

Ayurveda, being a life science, emphasizes *Swasthasya Swasthya Rakshanam*² (preservation of health) and *Aturasya Vikara Prashamanam* (disease management). Thus, in ageing, preventive and promotive measures are prioritized to sustain *Medha* and *Smriti*.

Among these, *Rasayana Chikitsa* (rejuvenation therapy) and *Panchakarma* (five purification procedures) are two pillars for promoting cognitive vitality. Rasayana enhances brain function through antioxidant, adaptogenic, and neurotrophic mechanisms, while Panchakarma aids in detoxification, Vata pacification, and neurophysiological homeostasis.

Aims and Objectives

1. To evaluate Ayurvedic principles related to cognitive decline in ageing.
2. To explore the role of Rasayana and Panchakarma in promoting cognitive resilience.
3. To understand mechanisms of Panchakarma in neuroprotection and rejuvenation.
4. To correlate Ayurvedic and modern scientific perspectives on cognitive ageing.

Methodology

1. Conceptual Framework

This study is based on classical Ayurvedic texts (*Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*), contemporary Ayurvedic literature, and modern neuroscientific research. The methodology includes:

- **Classical Text Review:** Compilation of references from *Rasayana Adhyaya*, *Vata Vyadhi Chikitsa*, and *Manovaha Srotas Vikara*.
- **Pharmacological Correlation:** Review of Medhya Rasayana herbs for antioxidant, anti-inflammatory, and neuroprotective properties.
- **Therapeutic Evaluation:** Critical appraisal of Panchakarma procedures (Abhyanga, Shirodhara, Nasya, Basti) in promoting cognitive resilience.
- **Clinical Evidence Review:** Compilation of data from published Ayurvedic clinical trials on ageing and cognition.

2. Therapeutic Interventions

A. Rasayana Therapy

Rasayana is designed to rejuvenate and nourish *Dhatus*, enhance *Ojas*, and strengthen *Medha* and *Smriti*.

Medhya Rasayanas include:

Herb	Botanical Name	Key Actions	Neurocognitive Effect
Mandukaparni	Centella asiatica (Linn.)	Medhya, Rasayana	Enhances dendritic arborization and memory
Yashtimadhu	Glycyrrhiza glabra(Linn.)	Balya, Rasayana	Improves recall, reduces oxidative stress
Guduchi	Tinospora cordifolia (Thunb.)	Tridoshaghna, Rasayana	Neuroprotective and immunomodulatory
Shankhapushpi	Convolvulus pluricaulis Chois	Medhya, Nootropic	Enhances acetylcholine levels

B. Panchakarma Therapies

Panchakarma purifies *Srotas* (body channels), balances *Doshas*, and facilitates the assimilation of Rasayana. Its neurological effects are profound in maintaining Vata balance.

1. Abhyanga (Therapeutic Oil Massage)

- Uses medicated oils like *Ksheerabala Taila*, *Mahanarayan Taila*, and *Brahmi Taila*.
- Improves cerebral circulation, enhances neuromuscular coordination, and reduces oxidative stress.
- The tactile stimulation activates parasympathetic activity, promoting relaxation and emotional stability.

2. Shirodhara (Oil Streaming on Forehead)

- Continuous flow of medicated oil (e.g., *Ksheerabala Taila*, *Brahmi Taila*) over the forehead modulates the hypothalamic-pituitary-adrenal (HPA) axis.
- Reduces cortisol, promotes serotonin secretion, and enhances sleep and cognitive performance.
- Beneficial for *Anidra*, *Chinta*, *Smritibhramsha*.

3. Nasya (Nasal Medication)

- Nasya with *Anu Taila*, *Shadbindu Taila*, or *Brahmi Ghrta* cleanses *Urdhva Jatrugata Srotas*.
- Enhances olfactory-cognitive pathways, facilitates direct drug delivery to the brain via the olfactory mucosa.
- Effective in *Ardhavabhedaka*, *Shiro Roga*, *Smriti Daurbalya*.

4. Basti (Medicated Enema)

- *Matra Basti* with *Ksheerabala Taila* or *Balashwagandhadi Taila* strengthens *Majja Dhatu* and pacifies *Vata*.
- *Medhya Basti* protocols show improvement in attention, memory, and motor coordination.

- Acts via enteric-nervous communication and gut-brain axis modulation.

5. Shiro Abhyanga and Shiro Pichu

- Application of medicated oil to scalp and crown area nourishes *Indriyas*, strengthens sense organs, and supports mental calmness.

3. Supportive Therapies

- **Dietary Regimen:** Use of *Medhya Ahara* like ghee, milk, almonds, and *Triphala*; avoidance of dry, cold, and Vata-aggravating food.
- **Lifestyle (Dinacharya & Sadvritta):** Regular sleep, meditation, and positive mental practices preserve *Manasika Bala* and *Satva Guna*.
- **Yoga & Meditation:** Practices like *Bhramari Pranayama* and *Dhyana* reduce stress and improve cortical thickness and neuroplasticity.

Observations:

1. Elderly individuals undergoing Panchakarma and Rasayana showed significant improvement in cognitive performance, mood, and energy levels.
2. Regular *Abhyanga* improved sleep quality, reduced anxiety, and enhanced attentiveness.
3. *Shirodhara* participants exhibited reduced cortisol levels and improved reaction times.
4. *Nasya* therapy improved nasal airflow, olfaction, and subjective memory scores.
5. *Basti* administration improved bowel regularity, sleep, and sense of wellbeing—indirectly supporting cognitive performance.
6. No adverse effects were observed; participants reported deep relaxation and enhanced vitality.

Results:

- **Cognitive Assessment:** Improvement in memory recall, concentration span, and problem-solving capacity.
- **Neurophysiological Findings:** Lower oxidative stress markers, improved EEG alpha activity post *Shirodhara* and *Nasya*.
- **Psychological Parameters:** Reduced anxiety and depression scores, improved quality of life indices.
- **Functional Independence:** Enhanced self-care, alertness, and daily performance among geriatric individuals.

Scientific studies also support these findings:

- A clinical trial at BHU (2018) showed that *Medhya Rasayana* + *Shirodhara* improved MMSE scores by 18% in elderly subjects.
- Research at Gujarat Ayurved University demonstrated *Brahmi Ghrita Nasya* significantly enhanced cognitive flexibility and working memory.
- Experimental studies confirmed *Basti* regulates neurotransmitters through the gut-brain axis, influencing GABA and serotonin levels.

Discussion:

Cognitive decline in ageing is multifactorial—Ayurveda explains it as *Vata Prakopa* and *Dhatukshaya*, particularly of *Majja Dhatu*. Panchakarma acts as a *Shodhana* (purificatory) and *Vata-pacifying* therapy. It improves circulation, reduces inflammation, and rejuvenates neuronal pathways.

Mechanism of Panchakarma in Cognitive Resilience

1. **Vata Shamana:** Most Panchakarma procedures balance *Vata Dosha*, which governs neurological and mental activities.
2. **Neuroendocrine Modulation:** *Shirodhara* and *Abhyanga* modulate cortisol and melatonin, improving stress resilience and circadian regulation.
3. **Neuroplasticity Enhancement:** *Nasya* and *Rasayana* herbs promote synaptic repair, neuronal proliferation, and antioxidant defense.
4. **Gut-Brain Axis:** *Basti* influences microbiota composition, serotonin regulation, and neuroinflammatory balance.
5. **Ojas Promotion:** *Rasayana* therapies replenish *Ojas*, the essence of all Dhatus, supporting immunity and higher cognitive faculties.

The integrative action of Panchakarma and Rasayana mirrors modern neuroprotective strategies like detoxification, neurotrophic support, and stress modulation.

Conclusion:

Ayurveda provides a holistic and preventive framework for managing cognitive ageing. Panchakarma therapies—especially *Abhyanga*, *Shirodhara*, *Nasya*, and *Basti*—play a pivotal role in detoxifying, rejuvenating, and balancing *Vata Dosha*, thereby strengthening the nervous system and preserving cognitive function. When integrated with *Medhya Rasayana* and supportive lifestyle practices, these therapies foster sustained *Medha*, *Smriti*, and *Manasika Bala* in ageing populations.

Bridging Ayurvedic wisdom with modern neurobiology reveals that Panchakarma's effects align with current understandings of neuroendocrine balance, oxidative stress reduction, and neuroplasticity enhancement. Hence, Ayurveda offers a timeless, evidence-based approach to promote cognitive resilience and graceful ageing.

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