

## MILD COGNITIVE IMPAIRMENT: AN AYURVEDIC UNDERSTANDING

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### ABSTRACT

Mild Cognitive impairment (MCI) is defined as the onset of cognitive impairments beyond that is expected based on education and age of individual, but which are not significant enough to interfere with their daily activities. It is often found to be a transitional state between normal ageing and dementia. *Vardhakya* (old age) is characterized by deterioration in the levels of vital capacity, energy, sexual potency, speech, perception, absorption, retention, memory and intellectual abilities along with the predominance of *vata*. *Vata* is the main controller of functions of *manas*. Due to old age and *vataprakopa*, impairment of cognitive functions are more common in old age. *Kalaja* and *Swabhavika SmritiHrasa* due to normal aging process are known as benign senescent forgetfulness or age associated memory impairment and are *Yapya* (irreversible, but can be maintained) clinical conditions. *Akalaja* and *Aswabhavika SmritiHrasa* is curable, but with difficulty (*Kashtasadhya*) and sometimes *Yapya* and should be treated according to the *Dosha* and the stage of the disease predominantly with *Rasayana* therapeutic measures.

**Keywords:** Mild Cognitive impairment, *Smritihrasa*, *vardhakya*, *Rasayana*

### INTRODUCTION

As percentage of the older people increasing<sup>1</sup> worldwide, their health problems are becoming an important public concern. It is due to advancements in health care system. Between 2015 and 2050, the proportion of the world's older adults is estimated to almost double, about 12% to 22%.<sup>2</sup> The physical and mental health problems of the older adults need to be recognized. Among these the neuropsychiatric disorders like dementia, mild cognitive impairment etc account for 6.6% of the total disability.<sup>3</sup> Cognitive impairment and dementia are increasing globally especially in the developing countries.<sup>4</sup> In mild cognitive impairment, the cognitive deficit is less severe than in dementia, and the activity of daily living is generally preserved. It is thought to be a precursor to dementia in up to one third of cases.<sup>5</sup> The prevalence of Mild Cognitive Impairment is estimated as 3%-42% worldwide<sup>6</sup> and in India it is about 4.3%.<sup>7</sup>

The clinical presentation of MCI is characterized by impairment of memory, poor retention and recall process, Language disturbance (eg, difficulty in finding words), Attention deficit (eg, difficulty in following or focusing on conversations), Deterioration in visuospatial skills (eg, disorientation in familiar surroundings in the absence of motor and sensory conditions that would account for the complaint). Impairment of these functions causing interference with day-to-day activities and interpersonal relationships.

This condition is not met as a disease entity in separate chapters of Ayurvedic classics and considered as a natural phenomenon, but sign and symptoms of cognitive impairment can be understood in terms of Ayurvedic concepts. One of the main causes for MCI is neuro-degeneration, *Rasayana* is very effec-

tive in preventing the neuro-degeneration and thus cognitive impairments. *Rasayana* has the property to check the *dhatukshaya* (degeneration) and *dhatuvaigunya*.

### Cognitive process

(1) *Indriya* (organ) receives *Arthas* when associated with *Manas* (mind).<sup>8</sup> This perception needs a chain of *Artha, Indriya, Manas and Atma* (soul).<sup>9</sup> This perception is called as *Uha* (cogitation).

(2) After this, process of actual analysis starts by *Manas*, i.e., *Chinta* (cerebration), *Vichara* (consideration), *Uha* (cogitation), *Samkalpa* (conviction) are performed. It gives the determination to perception. Hence, the journey from perception to determination, i.e. *Adhyavasaya* (mental effort) or *NischayatmakaBuddhi* (determined knowledge) is the first half of the physiology of *Manas*.

(3) The second half of the physiology of *Manas* is related with *Karmendriyas* (motor organs). *Manas* being *Ubhayatmaka Indriya*, it has to coordinate both *Jnanendriya* (sense organs) and *Karmendriya* (motor organs) in harmony with each other. After determination of the knowledge perceived by *Jnanendriyas*, essential desired reflex action is to be carried out, which is coordinated by *Manas* with the help of determined knowledge, i.e. *Nischayatmaka Buddhi*. Further initiation of the action is carried out by *Karmendriyas* (motor organs).

From above description it is confirmed that *Manas* is the important factor in the origin of *Prajnya* and hence, all activities (*Karmas*) which are being done. However, *Manas* itself is regulated by *Vata* and in old age (*Vridhdhavastha*), *Vatavaigunya* is already present hence functions of *Manas* is also affected physiologically to a great extent.

### Dimensions of cognitive process

*Prajnya* and *Buddhi* have been termed as synonyms in *Amarkoshas*.<sup>10</sup> *Charaka* define (*Prajnya*) *Buddhi* as “*Nischyatmakamjnanam*”. *Prajnya* is further described under the three forms *Dhi, Dhriti* and *Smriti*. *Dhi* is the power that differentiates between *Hita* (wholesome) and *Ahita* (unwholesome), external and internal factors (*Bhavas*) that affect the *Manas* and *Sharira*. *Dhriti*<sup>11</sup> is the power that controls the orientation and attitude. It is the regulator of the functions of *Manas* while *Smriti* helps the mind in recollecting the entire perceived or obtained knowledge on the basis of the concept formed by previous experiences.

The mind behaves accordingly by remembering the ethics (*Tatvajnana*).<sup>12</sup> *Medha* is the power that grasps and retains the knowledge, which is also not possible without the conjunction of mind. Hence, all these faculties are interlinked with each other and derangement of any of these will reflect on each other.

### Kalaja and akalaja jara in relation to cognitive impairments

As indicated above, the age is the most important risk factor for cognitive impairments, it is necessary to discuss some important aspects of aging in relation to cognitive impairment. Also, brain aging and its manifestations form the most important component of the aging process as it may lead to more crippling impact than gross somatic aging. *SwabhavaBalaPravritta* diseases occur as a result of the natural tendency of the body. They have been classified into two groups viz. *Kalaja and Akalaja*. Therefore, aging occurring naturally also can be considered as *Kalaja and Akalaja*. According to *VridhdhaVagbhata* and *AcharyaSarangdhara*, human beings lose one biological entity with the passing of each decade of life which can be shown in Table 1.<sup>13,14</sup> It is obvious from the foregoing discussion that ageing is a slow and continuous process, which affects various bodily tissues at different times. There are no two opinions regarding the inclusion of declining in *Medha* (intellect) as part of ageing. In this way the process of brain ageing, according to *Ayurveda*, definitely begins in the fourth decade of life, which includes neuro-degeneration. Therefore, neuro-degeneration starts in the 4th decade as a part of normal phenomena of aging. The contemporary biosciences also register similar views on brain aging considering it an inevitable phenomenon. The weight and volume of the brain decreases by 5% between ages 30 and 70 years, by 10% by the age 80 years and by 20% by the age of 90 years.<sup>15</sup> Aging is fundamentally the outcome of the overwhelming of the evolutionary processes of the body mind system by the involutory events hallmarked with degenerative changes like physiological disturbances of neurotransmitter secretions, blunting of dendrites and synapses and formation of beta amyloid plaques warranting reparative and rehabilitative care. Many elderly persons become dominantly more handicapped due to the age related degenerative brain disorders than the actual gross somatic aging.<sup>16</sup> In some pathological states, this process of neuro-

degeneration may be enhanced and lead to Alzheimer's and other types of dementia. Premature neuro degeneration and its association with aging When the rate of the aging process is disproportionate to the age of individual, the appearance of signs and symptoms of ageing (*Jara*) before the normal age occur that are mentioned under the *Aswabhavika* aging or *Kshaya*. It has been termed as *AkalajaJara*.

This type of ageing may be of greater intensity and rapidly progressing if no care is taken to check it. Cognitive deficits, Alzheimer's disease (AD), Parkinson's disease etc., belongs to neurodegenerative category where rate of neuro-degeneration is disproportionately increased leading to sign and symptoms of related diseases.

**Table 1:** Sequential loss of biological qualities in every decade of life

Decades	<i>AshtangaSangraha</i>	<i>Sharangadhara</i>
1.	Childhood ( <i>Baalya</i> )	Childhood ( <i>Baalya</i> )
2.	Growth ( <i>Vridhi</i> )	Growth ( <i>Vridhi</i> )
3.	Complexion ( <i>Prabha</i> )	Complexion ( <i>Prabha</i> )
4.	Intellect ( <i>Medha</i> )	Intellect ( <i>Medha</i> )
5.	Skin ( <i>Tvak</i> )	Skin ( <i>Tvak</i> )
6.	Reproduction ( <i>Shukra</i> )	Vision ( <i>Akshi</i> )
7.	Vision ( <i>Akshi</i> )	Reproduction ( <i>Shukra</i> )
8.	Hearing ( <i>Shruthi</i> )	Valour ( <i>Virya</i> )
9.	Mind ( <i>Manas</i> )	Reasoning ( <i>Budhi</i> )
10.	Sensory & motor organs ( <i>Sarvaindriyani</i> )	Motor organs ( <i>Karmendriya</i> )
11.	-	Mind ( <i>Manas</i> )
12.	-	Life ( <i>Ayu</i> )

In Ayurvedic literature, the etiological and risk factors for *Aswabhavika Kshaya* has been clearly described by *Acharya Charaka* and *Vagbhata*, under the heading of *Gramya Ahara Vihara* and clearly state that, regular practicing of these etiological factors (*Nidanas*) lead to different types of diseases related with premature aging including *Smritihrasa*.

It is obvious from the above description that the majority of etiological factors resulting in premature aging because of disproportionate degeneration of body tissues with age and *Smritihrasa* are mainly related with the diet, lifestyle and psychological status. They are *Vatavriddhikara* (increases vata), *Dhatu Ojokshayakara* (diminution of *dhatu* and *oja*), *Abhishyandi* (secretive), *Srotovarodhaka* (blockage of channels) and *Raja* and *TamagunaVriddhikara* (increases *rajas* and *tamas*). Thus, they are causing one or more of the following effect in the body *Srotovarodha* (Blockade of body channels), *Dhatukshaya* (tissue degeneration), *Ojokshaya* (diminution of *Ojas*), *ManasDushti* (disturbance in mental functions along with sense faculties), *Smritihrasa* (memory impairment), *Vatic diseases* (neurological disorders) etc. *Kalaja* and *Swabhavika* (natural) *Smritihrasa* due to normal aging process are known

as benign senescent forgetfulness or age associated memory impairment and are *Yapya* (irreversible, but can be maintained) clinical conditions. *Akalaja* (premature) and *Aswabhavika* (unnatural) *Smritihrasa* is curable, but with difficulty (*Kashtasadhya*) and sometimes *Yapya* (irreversible, but can be maintained) and should be treated according to the *Dosha* and the stage of the disease predominantly with *Rasayana* therapeutic measures.

During the old age *Vata* remains in its increased form which may vitiate any time even by the slight indulgence in the causative factors of *Vata*. Further the first thing mentioned by *Charaka* and *Sushruta* regarding the Ageing is "*Hiyamana*" or "*Kshiyamana*" which means there is decrease in the quantity, the relation of *Vayu* is inverse when increases *Vayu* decreases, and when decreases *Vayu* increases.

Many new scientific studies have been conducted showing that the *Ayurvedic Rasayana* therapy is very useful in the prevention of prognosis of cognitive impairments and other neurodegenerative disorders. Among the *Rasayana* drugs, *Medhyarasayana* are the special class of drugs described for prevention and management of *smritihrasa* and simultane-

ously managing the consequences of aging. *Medhyarasayana* drugs mentioned are *mandookaparni*, *guduchi*, *yastimadhu*, and *shankapushpi* may have pharmacological action similar to the nootropic agents. It may bring positive effect on higher mental function without undue psycho stimulation. It may have effect on cerebral circulation and may enhance oxygen consumption and glucose utilization by the brain cells. Potentially it may be useful in cases of degenerative brain disorders. Apart from *medhyarasayanas* mentioned in the classics other drugs like *amalaki*, *haridra*, *hareetaki*, *vacha*, *vyotismathi*, *kushmanda*, *jatamamsi*, *ashvagandha*, and *kapikacchu* also having anti-oxidant and neuroprotective activity, helps in preventing the cognitive deficits. Apart from anti-oxidant activity other factors to improve cognitive function and neuroprotection are acetylcholinesterase inhibition, NMDA antagonism, Dopaminergic activity, removal of amyloid plaques, inhibition of Tau aggregation, Folic acid, glutamic acid, Vitamin B<sup>17</sup> etc. Thus the above said drugs having these properties are choice of *rasayana* drugs to improve the cognitive functions. *Rasayana* drugs may be advised as food supplement as well as medicine to minimize the ageing and related disorders. Especially *MedhyaRasayana* may be useful in the degenerative disorders of brain, like dementia of senile and Alzheimer's types with the aim to correct the cognitive dysfunction and preventing the disease progression. *Rasayana* can increase mental health in old age by its unique effects on *vata*. Drugs like *amalaki*, *Haritaki*, *Jatamamsi*, *guduchi*, *ashvagandha*, *kapikacchu*, *kushmanda*, *shankapushpi* are *rasayana* drugs which have ability to pacify all 3 *doshas*. In particular *haridra* and *vyotismathi* can be used in *kaphadosha* condition. *Mandookaparni*, *bramhi*, *haridra*, *yastimadhu* are better choice in *pitta dosha* condition. *Yastimadhu*, *vacha*, *vyotismathi* gives better results in *vata dosha* condition.

## CONCLUSION

Cognitive impairment is a *Yapya* condition (irreversible, but can be maintained). Early detection of the problem and early starting of the appropriate *rasayanas* is required to prevent the progress of the condition. *Medhya* drugs are useful in the prevention and management of cognitive impairments and effective in improving not only the quality of life of

the patient, but also the care givers/family members in broader sense. Thus in conclusion, the control of aging and prevention of cognitive impairments is possible by *Rasayana* by which some or the other way improve the life expectancy.

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