



## Ayurvedic Perspectives on Alzheimer's Disease: A Conceptual Review Based on Charak Samhita

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### ABSTRACT

Alzheimer's disease (AD) is a progressive neurodegenerative disease marked by cognitive impairment, memory loss, and behavioral symptoms, and is currently the most common cause of dementia. Although Alzheimer's disease has been extensively documented in contemporary medical literature, a clear analogy to Alzheimer's disease can certainly exist in classical writings on Ayurveda, most specifically in the Charak Samhita text. This article discusses ancient texts of Ayurveda, mentioning cognitive impairments like Smriti Bhramsha (memory loss), Buddhi Vibhrama (Intellectual dysfunction), and imbalances of Manas Dosha, and correlates them with contemporary scientific understanding of Alzheimer's disease. The concepts of derangement of Vata Dosha, aging or Jara, improper dieting, lifestyle, stress, and nutritional deficiency, as documented in ancient texts of Ayurveda, almost correspond with contemporary risk factors documented for Alzheimer's disease. This article also gives a brief insight into preventive and curative measures documented in ancient texts of Ayurveda through concepts like Medhya Rasayana drugs (including Brahmi, Ashwagandha, Shankhapushpi), monitoring dieting, lifestyle modification, and mental control.

### I. Introduction

Alzheimer's disease<sup>1</sup> is a progressive neurodegenerative disease resulting in a decline in cognitive function, together with decline in activities of daily living and behaviour disturbance. Modern medicine has explained Alzheimer's disease under dementia<sup>2</sup>.

Degeneration of cerebral cortex causes dementia the most common type of Alzheimer's disease.

It is most common cause of dementia occurring mostly in

patient over 45 years. Genetic factors are important particularly if the age of onset is under 65 years and familial disease may account for some 15% of the cases, do genetic normalities on several different chromosomes have been described particularly chromosome 1, 14 and 21.

#### Epidemiology:

The global prevalence of dementia was reported to be 20.3

million in 1990, and it significantly increased to 43.8 million in 2016, representing a remarkable rise of 116%. From 1990 to 2019, the incidence and prevalence of Alzheimer disease and other dementias rose by 147.95% and 160.84%, respectively. Projections indicate that the number of people affected by dementia is expected to reach 150 million by 2050, representing a 4-fold increase<sup>3</sup>.

#### Pathology:

1. Pathological process consist principally of neuronal loss, principally in tempo parietal cortex but also in the frontal cortex, together with an inflammatory response to the deposition of senile and neurofibrillary tangles<sup>4</sup>.
2. Senile plaques and neurofibrillary tangles are recorded as hallmark of Alzheimer's disease though they may also be present with normal aging.
3. Microscopically the brain is 8 trophic particularly the cerebral cortex and hippo campus. Histology disease the presence of senile plaques and neurofibrillary tangles in cerebral cortex<sup>5</sup>.
4. Histochemical staining demonstrate significant quantities of amyloid in plaques.

#### Clinical features

Gradual decline in activities of daily living which ultimately leads to profound disability and dependance on others.

Patient has disturbance of memory language and visual skills

Patients present with gradual impairment of memory in association with disorder of other cortical function. Both short term and long term memory affected but affects in the former are usually more obvious. Other typical features are Apraxia, visual spatial impairment and aphasia<sup>6</sup>. In early stages patient made in I that there is anything wrong ( anosognosia) and depression is common.

Occasionally patient become more aggressive and clinical features are made actually worse by coexistence inter-current illness.

#### Diagnosis:-

Criteria for diagnosis of clinically probable assignment diseases are presence of an episode memory deficit in combination with impairment of at last one other cognitive domain. Frequently affected domains at an early stage are executive functions and word findings. Their must be a significant impact on activities of daily living and no alternative take explanations ( delirium, medication, comorbidity, depression)

Mini mental State examination is useful in initial evaluation of patient with suspected dementia.

Cognitive agent refers to each related decline that selectively affect specific cognitive process including delayed recall, processing speed and executive functions.

#### Risk Factors:-

1. **Diet-** Low serum albumin, iron, folate, tryptophan, vitamin B12, and cerebral metabolism of glucose and oxygen were also present. These symptoms suggest a 'protein-calorie malnutrition syndrome' in AD which could result in the development of NFT due to a chronic nutritional deficiency of calcium/magnesium.

In addition, marked deficiency of vitamins E, A, D, and K has been observed in plasma in AD suggesting that regular supplements might enhance cognition and reduce A $\beta$  deposition.<sup>7</sup>

2. **Vascular Disease** - CVD may result in A $\beta$  deposition and affect the age of onset of AD while A $\beta$  may itself trigger cardiovascular degeneration<sup>8</sup>. Individuals with congestive heart failure also have a higher risk of dementia<sup>9</sup> while cerebral ischaemia and stroke may lead to hypoxia, A $\beta$  deposition, and impairment of the BBB leading to neuronal degeneration<sup>10</sup>.
3. **Age** - With advancing age, the prevalence of AD increases to an estimated 19% in individuals 75-84 years of age<sup>11</sup> and to 30-35%, possibly up to 50% for those older than 85 years<sup>12</sup>.
4. **Infectious agents** - DNA from peripheral blood leucocytes and brain of AD patients has been analysed for cytomegalovirus (CMV), Epstein-Barr virus (EBS), and human herpes virus 6 (HHV-6), the data suggesting that EPV and HHV-6 could be risk factors for cognitive decline and progression to AD<sup>13</sup>. In addition, dental infections could be a risk factor<sup>14</sup>, a higher prevalence of the disease being observed in those patients with orofacial pain and periodontal infection although these effects could also be secondary to AD.
5. **Stress** - Prolonged stress predisposes susceptible individuals to a number of physiological disorders including cardiovascular disease, obesity and gastrointestinal disorders, as well as psychiatric and neurodegenerative disorders. Preclinical studies have suggested that manipulation of the glucocorticoid milieu can trigger cellular, molecular and behavioral derangement resembling the hallmarks of Alzheimer's Disease (AD). For example, stress or glucocorticoid administration can increase amyloid  $\beta$  precursor protein and tau phosphorylation which are involved in synaptic dysfunction and neuronal death associated with AD. Increased cortisol levels in biological fluids (e.g., plasma, saliva and cerebrospinal fluid) have been found in patients affected by AD<sup>15</sup>. This is not surprising at early and late times after the clinical diagnosis of AD because of the suffering conditions related to the early awareness of memory impairment and the progressively invalidating course of the disease. Of note, increased levels of cortisol might also be associated with medical risk factors
6. **Traumatic brain injury-** TBI could cause damage to the BBB resulting in leakage of plasma proteins and sensitization of the immune system to brain antigens normally isolated from them. Subsequently, a number of studies reported a connection between head injury and AD. In survivors of head injury, APP is observed in neuronal cell bodies and in dystrophic neurites surrounding A $\beta$  deposits, as observed in AD<sup>16</sup>.

Subsequently, it was shown that specific neurons in the medial temporal lobe (MTL) secreted large quantities of APP and that there were more APP-immunoreactive neurons in these areas in TBI<sup>17</sup>.

**How can we relate Alzheimer with Acharya Charak:** As we know Alzheimer is a type of dementia and Our Acharya

Charka Had Written about Manas Dosh, dhi vibhrama , smr̥ti-vibhram̥śa which leads to dementia only. Even if consider, Acharya Charak Had already Mentioned the reasons and Symptoms in Samhita which are almost the same as symptoms of Alzhiemer.

According To Charak Samhita:

#### How Mind Works:

1. "The characteristics of the mind's knowledge are the absence of knowledge and also the presence of emotions. When there is a proximity of the self, senses, and objects, knowledge does not manifest."18

**Explanation:** This verse indicates that the mind has certain traits regarding knowledge. It suggests that even in the absence of clear knowledge, emotional responses can exist. However, when the self (Atma), senses, and external objects are closely situated, true knowledge may not be present. This implies that emotional states or superficial understanding may overshadow the deeper insights or knowledge that the mind can have when it is clear and focused.

2. "The knowledge of the mind is influenced by its variability, depending on the proximity (of objects). The two qualities of the mind are subtleness (Aṇutva) and unity (Eikatva).19"

**Explanation:** This verse describes how the knowledge of the mind changes due to its variable nature and the surrounding conditions. The two essential qualities of the mind are:

- **Aṇutva:** This refers to the mind's ability to perceive and understand subtle or fine details.
- **Eikatva:** This refers to the mind's capability to focus and unite various thoughts or experiences into a coherent understanding.

3. "Whatever can be thought about, contemplated , meditated upon , or resolved , everything that is knowable by the mind is certainly designated as an object of meaning "20

**Explanation:** This verse emphasizes the various mental activities that contribute to understanding and knowledge. It indicates that all experiences and objects of thought can be categorized as meaningful when they are subjected to thinking, contemplation, meditation, or decision-making. Essentially, it underlines the importance of the mind's engagement in processing information to derive meaning from it.

4. "The control of the senses and the actions of the mind involves the self-discipline of one's own mind. From this, reasoning and contemplation arise, leading to the functioning of intelligence"21

**Explanation:** This verse highlights the importance of self-discipline and control over the senses and actions. It suggests that by regulating the senses and controlling the mind's impulses, one can develop the ability to reason and reflect. This process is essential for the proper functioning of intelligence. The interplay between sensory control and mental discipline is crucial for deeper understanding and cognitive development.

5. "The object of the senses is perceived by a focused

mind. It is conceptualized by the mind either positively or negatively."22

**Explanation:** This verse emphasizes that the way we perceive objects through our senses is significantly influenced by the state of our mind. When the mind is focused and attentive, it effectively grasps the objects of the senses. The process of conceptualization by the mind involves categorizing experiences as either positive (qualities or virtues) or negative (flaws or defects).

#### Doshas of Mind:

- "Rajas and Tamas are the mental doshas."23

**Explanation:** This refers to two types of mental qualities or doshas (Rajas represents activity, passion, and restlessness, while Tamas represents inertia, ignorance, and darkness). These can affect mental health and well-being.

- "The disorders arising from these (mental doshas) include desires, anger, greed, delusion, envy, pride, sorrow, anxiety, fear, and joy."24 **Explanation:** The passage lists emotional and psychological disorders that arise from the imbalances of Rajas and Tamas, highlighting the impact of mental health on overall well-being.

#### As per Acharya Charak Our Brain reaches to any conclusion on basis of evidence and reasoning25

The idea that the qualities or phenomena being discussed can be inferred similarly to those already mentioned. It sets the stage for exploring how various attributes can be recognized or understood through logical reasoning.

#### Examples of Qualities and Attributes:

- Fire can be assessed by its power to digest.
- Strength is assessed through physical exercise.
- The ear and other senses are understood through their ability to perceive sounds and meaning
- The mind is understood through its ability to engage with meanings.
- Listing Other Attributes and Emotional States:

The passage continues with a comprehensive list of emotional and psychological states:

Knowledge through professional practice  
Rajas from attachment

Delusion from ignorance  
Anger from resentment  
Sorrow from misery

Joy from ecstasy

Affection from satisfaction  
Fear from despondency

Courage from grief

Valor from motivation

#### 6. Discussion of Various Factors:

The passage continues with additional aspects: Position from stability

Faith from intention

Intellect from comprehension

Name from recognition

| Fortitude from resilience  
Submissiveness from regulation

7. **Mention of Time, Space, and Conditions:** The passage also emphasizes the role of time , space , and specific conditions in understanding the emergence of certain qualities or diseases:

Aging, similarity, and the rise of diseases Subtle symptoms of diseases

Specific dosha measurements and treatments

According To Acharya Charak , A person with Dull Mind cannot Engage in Day to Day Regular Activities. “A person with a dull intellect,Experiences neither happiness nor sorrow,Not adhering to righteous conduct or dharma,How can they find peace?,This person, who is devoid of memory and discernment.This mind wanders here and there”<sup>26</sup>

### **The harmful effects of excessive vata (wind/air element) caused by specific lifestyle factors on the heart and mind:**

**1. Ruksha-Alpa-Sheeta-Anna (Dry, Small, and Cold Food):**Consuming food that is dry, cold, and insufficient in quantity increases vata in the body. These food qualities lack the grounding and nourishing properties required to balance vata.

**2. Vireka-Dhatu-Kshaya-Upavaasa (Purging, Depletion of Tissues, and Fasting):** Practices like excessive purging (virechana), depletion of body tissues (dhatu kshaya), and fasting (upavaasa) further aggravate vata, leading to an imbalance in the body's doshas (bio-energies).

**3. Ati-Vridha Vata (Excessive Vata Aggravation):**When vata is excessively increased due to the above factors, it starts affecting vital organs and systems in the body, particularly the heart and mind.

**4. Chintadi-Jushtam Hridayam Pradushya (Disturbance of the Heart Due to Worry):** Excessive worry, anxiety (chinta), and other mental disturbances affect the heart (hridaya), leading to further complications. The heart becomes “pradushya” or afflicted, causing emotional instability.

**5. Buddhi and Smriti (Intelligence and Memory):** Once vata has affected the heart, it rapidly impacts cognitive functions. The mind's faculties, such as intelligence (buddhi) and memory (smriti), are quickly impaired, leading to confusion, forgetfulness, and reduced mental clarity.

### **How Vata Can Impact The Mind:**

The five forms of Vata dosha in Ayurvedic medicine, which include Prana Vata (related to life force), Udana Vata (related to speech), Samana Vata (related to digestion), Vyana Vata (related to circulation), and Apana Vata (related to elimination).A proper understanding of these five types of Vata is crucial for assessing their effects on health.An imbalance or disturbance in Vata can lead to a lack of perception or sensory experience. The senses become "shunya" or void, implying diminished function or awareness.An increase in Vata can lead to a decline in memory strength (smriti-bala). The cognitive function and memory can be impaired when Vata is aggravated.<sup>27</sup>

**The effects of alcohol consumption on memory and overall well-being:** If an individual experiences even a slight disruption in memory (smṛti-vibhramśa), it negatively affects all aspects of their life. Memory plays a crucial role in decision- making, emotional stability, and overall mental health. A disturbance in memory can lead to confusion, poor judgment, and an inability to enjoy life.

Individuals who are aware of the harmful effects of alcohol (madya) on health and well-being recognize the importance of being cautious with its consumption.

Those who are knowledgeable about the detrimental effects of alcohol make a conscious effort to avoid it. This rejection is based on an understanding of how alcohol can lead to memory disturbances and other negative consequences for both physical and mental health.<sup>28</sup>

Buddhi vibhrama( as agnosia According to Acharya Charaka explains dhi vibhrama (buddhi vibhrama) is the condition in which the individual perceives useful things as harmful and understand good thing as bad one and vice versa.<sup>10</sup> It is actually considered as perceptual disorder in which sensation is preserved but the ability to recognize or to identify a stimulus or know its meaning is lost. Agnosia, the word meaning is “without knowledge.” Patients with agnosia cannot understand or recognize or identify what they see, hear or feel. Often there is loss of ability to recognize objects, persons, sound, shapes, or smells while the specific sense is not defective nor is there any significant memory loss.

### **Medicine Related to Treatment and prevention of any Manas Rog as per Acharya Charak**

Medicinal remedies are the first step toward calming the mind. In Ayurveda, specific herbs and formulations are used to treat mental disturbances, indicating that physical health plays a crucial role in mental well-being.

Daiva-yukti-vyapāśrayaiḥ<sup>30</sup>: This part highlights the importance of divine influence or guidance (daiva) and wisdom (yukti) in the healing process. It suggests that spiritual or divine elements can contribute to achieving mental calmness and overall balance.

Mental qualities such as knowledge and wisdom, along with attributes like courage, memory, and concentration, are essential in achieving mental peace. Each of these qualities contributes to a person's ability to manage their thoughts and emotions effectively.

Three categories of medicinal approaches in Ayurveda:

- **Divine Support:** Emphasizing spiritual practices, rituals, and divine interventions for healing and balance.
- **Rational Approaches:** Focusing on logical dietary choices and the strategic use of medicinal substances.
- **Mental Discipline:** Highlighting the importance of mental control and restraint to maintain overall well-being.

### **Results**

The Charak Samhita describes cognitive decline through the lens of Vata dosha imbalance, which is linked to aging and neurodegeneration. Smriti Bhamsha, or memory loss, is identified as one of the primary manifestations of this imbalance, with additional symptoms such as confusion, forgetfulness, and disorientation, which correlate with early and moderate stages of Alzheimer's. Buddhi Vibhrama, or intellectual decline, describes the loss of decision-making capabilities and reasoning, similar to cognitive impairment seen in AD. Causes of these conditions are attributed to poor nutrition, improper

lifestyle, emotional distress, and aging, which are also recognized risk factors for Alzheimer's. Treatment in Ayurveda includes the use of Medhya Rasayana (memory-enhancing herbs), such as Brahmi, Ashwagandha, and Shankhapushpi, known for improving cognitive function

### Discussion

The symptoms and causes of cognitive decline described in the Charak Samhita bear significant parallels to Alzheimer's disease as understood today. The concept of Vata imbalance corresponds to neurodegenerative processes linked to aging in modern science. The Ayurvedic focus on preventive care through diet, lifestyle, and mind-body practices offers a complementary

### Conclusion

Charak Samhita's ancient descriptions of cognitive decline offer a holistic framework for understanding and managing

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