

REVIEW ARTICLE

# Ayurvedic Profiling of Alzheimer's Disease

Dale E. Bredesen, MD; Rammohan V. Rao, PhD

## ABSTRACT

Alzheimer's disease (AD) is an age-associated, progressive neurodegenerative disease that is characterized by severe memory loss, personality changes, and an overall decline in cognitive function. The cause of AD is not yet completely defined and efforts to find a cure for it have so far been disappointing. AD is one of the most significant health care problems nationally and globally. Recently, we described a personalized therapeutic approach called metabolic enhancement for neurodegeneration (MEND) that successfully reversed the cognitive decline in patients with early AD. The magnitude of the improvement was exceptional, providing testimony to the fact that a personalized and programmatic approach to cognitive decline is highly effective. Ayurveda is a personalized system of traditional medicine native to India and the

Indian subcontinent. Although a direct reference to AD in the ancient Ayurvedic literature is missing, concepts including forgetfulness, memory loss, and brain cell loss have been described. Using the clinical information and the metabolic profiling of AD individuals we recently reported using the MEND program, we now describe in this commentary, 3 subtypes of AD based on the Ayurvedic interpretation. Ayurvedic profiling of patients with AD reveals 3 readily distinguishable subtypes, namely *Vata*, *Pitta*, and *Krimi*, which will prove useful in patients with cognitive decline and those at risk for such decline from the standpoint of specific subtype-based Ayurvedic intervention. (*Altern Ther Health Med*. 2017;23(3):46-50.)

**Dale E. Bredesen, MD**, is a professor at the Buck Institute for Research on Aging in Novato, California, and professor of Neurology in the Easton Laboratory for Neurodegenerative Disease Research, Department of Neurology, University of California, Los Angeles, in Los Angeles, California. **Rammohan V. Rao, PhD**, is an associate research professor at the Buck Institute for Research on Aging in Novato, California.

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Corresponding author: Rammohan V Rao, PhD  
E-mail address: [rrao@buckinstitute.org](mailto:rrao@buckinstitute.org)

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**A**lzheimer's disease (AD) is an age-associated, progressive neurodegenerative disease that is characterized by severe memory loss, behavioral symptoms, personality changes, and an overall decline in cognitive function. The cause of AD is incompletely defined, and no truly effective therapy exists.<sup>1</sup> The disease represents a major health care problem, with more than 5 million Americans estimated to suffer from this disease, and a recent

study showing that AD is now the third leading cause of death.<sup>1,2</sup> Efforts to find a cure for AD have so far been disappointing. The drugs currently available to treat the disease address only its symptoms and are of limited efficacy. A suitable therapeutic intervention that could postpone the onset or progression of AD would dramatically reduce the number of cases in the next 50 years.<sup>3-5</sup>

Ayurveda is a system of traditional medicine native to India and the Indian subcontinent. Although a direct reference to AD in the ancient Ayurvedic literature is missing,<sup>6-8</sup> a condition termed *Prana Vrtta Samana Vatavyadhi* under the broad category of *Vatavyadhi* (neurodegenerative diseases) has several pathological descriptions and symptomology that seem to match with the Western correlates of AD.<sup>6,7,9</sup> Using the clinical information and the metabolic profiling of AD individuals we recently reported,<sup>10-13</sup> we now describe 3 phenotypic subtypes based on an Ayurvedic interpretation of AD, namely *Vata*, *Pitta*, and *Krimi*. The classification of AD into these three Ayurvedic subtypes may be very useful for identifying the specific subtype of patients with cognitive decline and those at risk for such decline, and for making specific therapeutic recommendations.

## VATA-TYPE AD

### Etiology (*Nidana*)

Because AD is an age-associated neurodegenerative condition occurring at the Vata stage of life, Vata-type AD is compatible with the metabolic profile in type 2 AD characterized by the withdrawal of trophic support and reduction of hormonal support.<sup>11</sup> Vata-type AD is brought on by a Vata-provoking lifestyle coupled with a predisposition toward developing the condition.<sup>7,14,15</sup> Vata-provoking life style practices include unstable routines; overwhelming stress; and eating a dry, cold, light diet.<sup>7,16</sup> The condition may be associated with imbalances in all 5 subtypes of Vata, namely *Prana Vayu* (inward moving air-absorption of impressions), *Samana Vayu* (afferent impulses—movement of thoughts), *Vyana Vayu* (efferent impulses—processing of thoughts), *Udana Vayu* (memory and recall), and *Apana Vayu* (digestion and dispersion of thoughts), suggesting a failure to absorb healthy impressions from all 5 senses.<sup>7,17,18</sup> This may ultimately affect cognition and the thought process characterized by personality and behavioral abnormalities.

### Symptomology (*Rupa*)

In addition to memory decline, patients exhibit mood swings, confusion, emotional lability, and sleeplessness. They fail to absorb new information and have difficulty finding words. Constipation may be a major issue among these patients as well. Other Vata-type disorders associated with this condition include insulin resistance (*Madhumeha*-subtype of *Vataja Prameha*),<sup>19</sup> and early hormonal loss in women (*Artava Kshaya*).<sup>20</sup> The patients with Vata subtype of AD may be slightly older, often in their 80s. Vata-associated atrophy or degeneration especially in the temporo-parietal regions is associated chiefly with reductions in glucose utilization as demonstrated by fluorodeoxyglucose-positron emission tomography (FDG-PET).<sup>11</sup>

### Treatment (*Chikitsa*)

Prevention is the best remedy. Ayurvedic rejuvenative therapies (*Rasayana* and *Vajikarana*) therapies are recommended for long-term care of older adults and to improve their resistance and immunity (*Ojas*).

### Diet

A diet that will neutralize the light, cold, and dry qualities of Vata is recommended.<sup>16</sup> Hence, foods need to be oily (moist), freshly cooked, warm, and moderately spiced. Foods that incorporate sweet, sour, and salty tastes help in alleviating the Vata imbalance.<sup>16</sup> A diet containing whole grains, fresh produce, nuts, ghee, coconut, or sesame oil is preferred. Consumption of fruits and vegetables across the color spectrum will help to maximize the intake of protective antioxidants, minerals, and vitamins. Fruits and vegetables are rich sources of fiber as well and help in relieving constipation and other gut issues. Daily servings of fruits, greens, and vegetables should be part of the brain-protective regimen. Meals should be taken regularly, at the same time each day. Ayurveda also recommends

**Table 1.** Herbal Formula for Ayurvedic-AD Subtypes

Herb function	Parts	Vata	Pitta	Krimi
Chief	8	Ashwagandha	Gotu Kola	Guggulu
Support-1	2	Brahmi	Turmeric	Shilajit
Support-2	2	Sankhpushpi	Guggulu	Triphala
Support-3	2	Gotu Kola	Sankhpushpi	Gotu Kola
Assist-1	1	Shilajit	Brahmi	Brahmi
Assist-2	1	Guduchi	Ashwagandha	Ashwagandha
Assist-3	1	Triphala	Triphala	Turmeric

Ashwagandha (*Withania somnifera*), Brahmi (*Bacopa monnieri*), Gotu Kola (*Mandukaparni*, *Centella asiatica*), Guduchi (*Tinospora cordifolia*), Guggulu (*Commiphora mukul*), Sankhpushpi (*Convolvulus pluricaulis*), Turmeric (*Curcuma longa*), Triphala [*Amalaki* (*Embolica officinalis*), *Bibhitaki* (*Terminalia bellirica*), and *Haritaki* (*Terminalia chebula*)]

Note: Ayurvedic herbs recommended for AD subtypes. The herbal formula is based on the herbal properties, functional characteristics, and mechanistic actions that have already been described.<sup>6,7</sup> The herb formulation is based on the specificity, efficacy, and energetics of each individual herb so as to match with the patient's subtype.<sup>18</sup>

Abbreviation: AD, Alzheimer's disease.

a minimum of 12 hours of fast between the last meal of the previous day and the first meal the following day.<sup>21</sup> Recent studies suggest that daily episodes of fasting triggers a hypoglycemic state in the brain, leading to autophagy and lipid catabolism and liberation of brain protective ketone bodies, all of which results in enhancement of brain plasticity and improvement in cognition.<sup>21-23</sup>

### Herbs

Nervines are recommended as they tend to act as stimulants or sedatives and are used for correcting excess activity or deficiencies of the nervous system. A list of herbs that may prove useful for AD based on their properties, functional characteristics, and mechanistic actions has already been described.<sup>6,7</sup> Specific herbs for a Vata-AD individual are described in Table 1. The combination of *Ashwagandha*, *Brahmi*, *Gotu Kola*, *Guduchi*, and *Shankhpushpi* provides both neuroceutical<sup>1</sup> and cogniceutical<sup>1</sup> qualities owing to the herb's role in antioxidant activity, free radical scavenging activity, ability to increase cholinergic activity, neurogenesis, and memory-enhancing properties.<sup>6,7</sup> The herb formulation is based on the specificity, greatest effect, and energetics of each individual herb so as to match

i. Both of these terms seem to have been coined by Zack Lynch, author of *The Neuro Revolution: How Brain Science Is Changing Our World*. We define *neuroceutical* as herbs/supplements that specifically strengthen the neuron and its function. *Cogniceuticals* are herbs/supplements that improve memory acquisition, consolidation, or recall.

with the patient's subtype. Herbs could be consumed orally, as herbal teas or taken in suitable oil and administered intranasally.<sup>6,7,24</sup> Intranasal intervention helps as the delivery is rapid, bypasses the blood-brain barrier and directly targets the central nervous system.<sup>25,26</sup>

### Rejuvenation Therapy (*Panchakarma*)

Panchakarma therapies are highly recommended as they provide the strength and nourishment to the deeper tissues (*Dhatu*s) thereby pacifying the Vata imbalance.<sup>27,28</sup> Palliative therapy (*Shamana Chikitsa*) is recommended for Vata-AD patients. Oleation and fomentation therapies are important as they neutralize the Vata-triggered coldness and dryness thus increasing systemic blood circulation as well as cerebral blood flow.<sup>29,30</sup> Medicated oils containing Vata-subtype specific herbs (Table 1) are recommended that could be used in massage therapies (*Abhyanga*) and transcranial therapies.<sup>6,7</sup> Medicated oils are known to be rejuvenative with a strong nourishing action on the nervous system.<sup>29-31</sup> After an herbal oil massage the patient undergoes a fomentation-herbal steam bath (*Swedana*) to facilitate the internal absorption of the medicated oil. All of the aforementioned combined therapies are believed to increase cerebral blood flow and trigger efflux of toxic matter through increased lymphatic drainage.<sup>6,7,32</sup>

### Other Recommendations

Outdoor activities including walking in the park, on the beach, or in the garden are an excellent therapy, especially for Vata-AD patients as these exercises bring in the heavy, slow, and stable qualities of the earth element into the nervous system.<sup>33-36</sup> Yoga, meditation (*Dhyana*), and gentle breathing techniques (*Pranayama*) are excellent tools to keep the nervous system calm and balanced.<sup>37-40</sup> These techniques can be easily imparted to the patients with early and moderate AD. There is evidence from studies on healthy volunteers that use of diaphragmatic breathing techniques may improve different aspects of cognitive function.<sup>41</sup> Similarly, meditation may reduce stress proteins, optimize the lipid profile, lower oxidative stress, strengthen neuronal circuits, and enhance cognitive reserve capacity, all of which may reduce the excess Vata qualities associated with AD.<sup>42</sup>

## PITTA-TYPE AD

### Etiology (*Nidana*)

Pitta-type AD is compatible with the metabolic profile in type 1 AD (inflammatory AD).<sup>11</sup> Although AD is primarily a Vata disorder, the condition can precipitate in people of Pitta nature exhibiting excess heat from a Pitta-vitiating lifestyle that triggers degeneration of the hippocampal/cortical cells.<sup>28,43,44</sup>

### Symptomology (*Rupa*)

The key symptom indicating the role of Pitta is inflammation that is an underlying phenomenon in AD

pathogenesis characterized by the presence of proinflammatory cytokines, inflammatory microglia and activated astroglia, chemokines, acute-phase reactants, and other mediators of inflammation in AD brains.<sup>5,11,45</sup> Pitta-provoking factors include the regular intake of hot, sour, salty, strongly acidic and fermented foods. Alcohol, anger, rage, and chronic exposure to sun may also be notable causes.<sup>28,44</sup>

### Treatment (*Chikitsa*)

Prevention is the best remedy. Ayurvedic rejuvenative therapies (Rasayana and Vajikarana) utilizing cool herbs and oils are recommended.

### Diet

A diet that will neutralize the heat and dry qualities of Pitta is recommended.<sup>16</sup> Hence, foods need to be oily (moist), freshly cooked, warm, and moderately spiced with cooling spices. Foods that incorporate sweet, bitter, and astringent tastes help in alleviating the Pitta as they primarily bring in moist, cool, and heavy qualities. Pungent, sour, and salty diets need to be avoided as they can trigger the heat and underlying inflammation. It is advisable to stay away from pickled and heavily fermented foods. A diet containing whole grains, bitter vegetables, bitter greens, dairy, cooling oils such as ghee, coconut and olive, and raw salads is preferred. Consumption of fully ripened fruits will help to maximize the intake of protective antioxidants that will dampen the inflammation. A short fast between 2 meals is recommended as well.

### Herbs

Cooling nervines are recommended as they tend to alleviate the excess heat or inflammation. Specific herbs for a Pitta-AD individual are described in Table 1. Turmeric is a potent anti-inflammatory spice. *Guggulu* is used in the formula (1) to treat inflammation and disorders of lipid metabolism, (2) as an antioxidant, and (3) for its role in blocking acetylcholinesterase activity.<sup>6,7</sup> Administration of herbs is similar to that of Vata AD.

### Rejuvenation Therapy (*Panchakarma*)

Panchakarma therapies are similar to the Vata AD except for the presence of Pitta-relieving herbs in the oils.

### Other Recommendations

Pitta AD patients can follow the same recommendations as for Vata AD as these techniques help to keep the nervous system calm and balanced.

## KAPHA-TYPE AD

Although we did not encounter any patients who had symptoms suggestive of Kapha-type AD, some of the Kapha-associated symptoms may occur concurrently with Vata AD or Pitta AD. At this time, there is no evidence to suggest a Kapha-specific AD pathology.

### Etiology (*Nidana*)

The concept of germs that includes various pathogens was known in Ayurveda and is referred to by the term *Krimi*, indicating parasitic infection and toxin poisoning.<sup>46,47</sup> Based on the clinical evidence presented by several AD subjects who did not fall into either the Vata or Pitta categories, we chose to classify these people in the Krimi-type AD based on 2 external factors that were common to most of these patients, namely (1) exposure to mycotoxins, aquatoxins, and other pathogens; and/or (2) exposure to toxic chemicals and metals.<sup>12</sup>

### Symptomology (*Rupa*)

The profile of patients falling in the Krimi-AD category is somewhat different than the first 2 subtypes; the onset is typically younger and *ApoE* genotype is usually 3/3. The onset usually follows a period of high stress, insomnia, and depression. These patients retain new memories but fail to recall old memories. Imaging studies reveal widespread cerebral atrophy and frontal-temporal-parietal abnormalities on FDG-PET.<sup>12</sup> The symptoms presented by these patients are characteristic of patients exposed to biotoxins/mycotoxins that include molds present in water-damaged buildings, tick-borne pathogens, or aquatoxins such as those that trigger Lyme disease and/or exposure to high levels of mercury, lead, or arsenic. Most of these patients also have low serum zinc, and zinc deficiency is known to affect many functions that are related to cognitive performance and AD.<sup>11,12</sup>

### Diet

A diet with an emphasis on cool, light, and moist foods that has properties for chelation and detoxification is recommended. Fruits such as green apples, bananas, grapes, and citrus fruits are rich sources of pectin that is a known chelator of heavy metals and other toxic materials from the blood stream. Cilantro leaves, coriander seeds, and parsley are excellent foods for removing heavy metals such as mercury, aluminum, and lead from the body. Cruciferous vegetables such as broccoli, kale, and cabbage contain antioxidants that activate the detoxifying enzymes in the body. Sulfur-rich foods, such as onions, garlic, cauliflower, eggs, Brussels sprouts, broccoli, and cabbage eliminate heavy metals such as lead from the body.

### Detoxification, Purification, and Rejuvenation Therapy (*Panchakarma*)

Panchakarma therapies are similar to that described previously except for the presence of detoxifying herbs and herbs that act as chelators. Specific herbs for a Krimi-AD individual are described in Table 1. *Shilajit*, *Guggulu*, and *Triphala* are potent antiparasitic and detoxifying agents.<sup>6,48</sup> Administration of herbs is as described in the earlier sections. *Bhasmas* are incinerated minerals, metal ash, or metallic oxides that are prepared by purifying a metal until it turns into a powdered ash.<sup>49</sup> This complex process involves several

rounds of incinerating the metal together with other herbs until the preparation is pure. *Yasada Bhasma* is a Zn-based formulation recommended for diabetes, visual disorders, and wound healing.<sup>49,50</sup> Whether it would be a favorable drug of choice for Krimi AD remains to be seen, although owing to the controversy surrounding the use of metal oxides, its availability and use may be an issue.

### DISCUSSION AND CONCLUSION

We have developed and implemented the first comprehensive protocol for reversing AD-associated cognitive decline, called metabolic enhancement for neurodegeneration (MEND), which has shown reversal of cognitive decline repeatedly in the several hundreds of patients, with sustained improvement.<sup>10-13</sup> The approach is personalized and responsive to suboptimal metabolic parameters.<sup>10-13</sup> Optimizing these metabolic parameters has proved effective in several individuals with early AD or the pre-AD conditions, mild cognitive impairment or subjective cognitive impairment. The involvement of multiple metabolic parameters in the AD process resulted in distinguishing 3 primary subtypes of AD including inflammatory, noninflammatory, and cortical.<sup>10-13</sup> Using the clinical information and the metabolic profiling of AD individuals has also helped us in profiling the AD patients into 3 Ayurvedic subtypes, namely Vata, Pitta, and Krimi. This classification of 3 Ayurvedic subtypes of AD will prove useful in patients with cognitive decline and those at risk for such decline from the standpoint of specific subtype-based interventions. Although the distinctive features and specific presentation of each Ayurvedic subtype deserve further studies, given that this identification links to optimal treatment, it is likely to be of interest to many.

### AUTHOR DISCLOSURE STATEMENT

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