

Dementia: An Evidence-Based Review of Common Presentations and Family-Based Interventions

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The number of US older adults with dementia is expected to grow over the next several decades. For instance, the number of persons with Alzheimer disease is predicted to increase by 50% by 2030. Physicians commonly come into contact with patients who have dementia and, as such, need to understand its varied presentation. In the current review, the most common types of dementia, including Alzheimer disease, frontotemporal dementia, dementia due to vascular disease, and several others, are described. Characteristics and etiologic findings of cortical and subcortical dementias are differentiated, and cognitive profiles and symptoms of specific types of dementia are reviewed. An osteopathic approach to care, focusing on establishing a relationship with patients and their families, is also discussed.

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As the US older adult population increases,¹ it is expected that the number of adults with dementia will also increase. It is projected that over the next 2 decades, the number of people aged 65 years or older with Alzheimer disease (AD) will increase by approximately 50%, from 5.1 million in 2010 to 7.7 million in 2030.² With this increase in incidence, physicians in all specialties of practice will need to become more familiar with the symptoms and presentation of dementia. Alzheimer disease is perhaps the most well-known dementia—and easily the most feared—but many types of dementia exist. In the current article, the most common types of dementia and the incorporation of osteopathic principles and practice into the care of patients with dementia are reviewed.

Overview and Definition

By definition, dementia constitutes impairment in memory and at least 1 domain of cognitive functioning (eg, executive functioning, language, visuospatial skills, praxis, judgment, personality, abstract thinking) that represents a decrease from a previous level of functioning and results in impairment in daily activities.³ Certain conditions must be ruled out before dementia is diagnosed.³ When dementia is initially suspected, a thorough clinical work-up, including patient history, physical examination, and laboratory tests, is recommended to help rule out reversible causes of cognitive impairment. Although a complete description of the clinical work-up of dementia is beyond the scope of the current article, several diagnoses—mild cognitive impairment (MCI), delirium, and depression—must be carefully excluded when dementia is suspected.

Mild Cognitive Impairment

Mild cognitive impairment refers to subtle cognitive deficits that exceed expected decline for age and level of education but that do not interfere with activities of daily living.⁴ Although neurodegeneration is the most common cause, trauma, ischemia, depression, or substance abuse are also possible causes.⁵ The most common type of MCI is amnesic MCI, in which memory complaints predominate. A review⁶ of epidemiologic studies revealed variable prevalence rates of MCI in the general population, ranging from 3% to 19%, with 11% to 33% of MCI cases progressing to dementia within 2 years. However, MCI can also remain stable for decades and never progress to dementia.⁴ Indeed, MCI was once thought to be preclinical AD, but this notion has since been dispelled.

Delirium

Delirium is an acute disturbance of consciousness accompanied by changes in cognition that cannot be accounted for by preexisting or evolving dementia.³ It has a rapid onset—usually developing over hours or days—and symptoms tend to fluctuate during the course of the day, worsening in the evening.³ Visual hallucinations, disturbances in sleep-wake cycle, disorientation, and rambling or incoherent speech are typical in patients with delirium.⁷ Delirium is often the direct physiological consequence of a general medical condition, a medication, a toxic substance, or substance withdrawal. In most cases, however, the exact cause is unclear.⁸ Prevalence rates of delirium among elderly populations within hospital settings range from 10% to 40%,⁸ with comorbid delirium occurring in approximately 13% of community-dwelling elderly patients with dementia.^{7,9} The rapid course of symptom onset most reliably differentiates delirium from dementia.

Depression

Depression is known to impair psychomotor function, learning, short-term recall, attention and concentration, and interest in activities.⁵ Nearly all persons with

KEY POINTS

Dementia is an impairment in memory and in at least 1 domain of cognitive functioning (eg, executive functioning, language) that represents a decline from the patient's baseline level and results in functional impairment.

Dementia can be characterized as cortical, subcortical, or both; that is, it may be caused by diffuse cortical neuronal atrophy (ie, cortical dementias) or by diseases involving subcortical structures (ie, subcortical dementias).

The 3 most common types of dementia are Alzheimer disease, vascular dementia (primarily due to small vessel ischemia), and dementia with Lewy bodies.

Guidelines for the management of dementia include early identification, preservation of cognitive and functional abilities through pharmacologic and psychosocial interventions, coordinating care, and partnering with the patient and the patient's family caregivers through education, referrals to community resources (eg, home supports), and advance care planning (eg, nursing home placement, end-of-life decisions).

depression report a decline in memory, which is a direct result of limbic system dysfunction. Notably in older adults, the cognitive effects of depression can vary in scope and severity and may result in dementia.¹⁰ *Pseudodementia* and *dementia syndrome of depression* are common terms used to describe symptoms of depression that mimic or exacerbate symptoms of dementia.^{5,10} Unlike AD, dementia due to depression can be reversed; hence, differentiation is essential so that aggressive pharmacologic management of mood symptoms can be initiated.⁵

In contrast to patients with AD, who often deny cognitive symptoms due to impaired insight, patients with depression tend to report severe and pervasive cognitive symptoms that exceed measured impairment and are out of proportion to their relatively preserved functional abilities. Furthermore, patients with depression exhibit

less severe deficits in memory and generally have spared temporal orientation and language skills compared to patients with AD.⁵ Depression and dementia do, however, frequently co-occur. Indeed, comorbid depression is common in patients with dementia, with mood symptoms exacerbating cognitive symptoms and vice versa.¹⁰ Furthermore, in elderly patients without a previous history of depression, onset of late-life depressive symptoms has been shown to be a precursor to dementia.¹¹

Cortical vs Subcortical Dementia

In better understanding dementia, one helpful differentiation is whether the pathologic process primarily involves cortical or subcortical brain structures. Dementia may result from diseases causing diffuse cortical neuronal atrophy (ie, cortical dementias) or diseases involving subcortical structures including vasculature, the thalamus, and the basal ganglia (ie, subcortical dementias).⁵ Cortical dementias are typically progressive and degenerative⁵ and tend to be associated with impaired language skills (aphasia), motor coordination (apraxia), perception (agnosia), reasoning and problem solving, learning, and recall.¹² By contrast, subcortical dementias may be progressive, static, or reversible and are associated with cognitive slowing, emotionality (eg, apathy, irritability, depression), and deficits in attention, arousal, and processing speed (Table).¹³ Even with these distinct differences, symptoms of the various cortical and subcortical dementias can overlap,¹³ making differentiation difficult.

Cortical Dementias

Alzheimer Disease

Alzheimer disease is the most common type of dementia, affecting 11% of persons aged 65 years or older and 32% of persons aged 85 years or older in the United States.¹⁴ A genetically-linked early onset type of AD (in which the onset of symptoms begins prior to age 65 years) is rare and estimated to account for less than 2% of AD diagnoses.¹⁵ The neuropathologic process of AD includes intracellular neurofibrillary tangles and extracellular β -amyloid plaques. The hippocampus and adjacent temporal lobe are affected early in the disease course, accounting for AD's characteristic memory

impairment with rapid forgetting.¹⁶ As the tangles and plaques progress to the frontal and parietal regions of the brain, cognitive symptoms advance to include impaired judgment, word finding, temporal orientation, and route navigation. Speech is often confused or vague, missing nouns, and focused on the past.¹² Poor insight into the disease process is common,¹² hence it is

The number of patients with dementia is rapidly increasing, hence physicians must be knowledgeable about differential diagnosis and treatment.

common for patients to think that nothing is wrong or that their memory symptoms are minor.¹² Thus, family members often are the ones to raise concern about dementia. Social skills are generally preserved¹² with patients often described as “pleasantly confused.” Later in the disease course, patients with AD eventually exhibit changes in personality, agitated behavior, or both.¹⁵ The typical disease course from symptom onset to death is 6 to 9 years.¹⁷

Dementia With Lewy Bodies

Dementia with Lewy bodies is the second most common form of cortical dementia, accounting for 20% of all dementia cases.¹⁸ Prevalence rates are estimated to be as high as 5% among the entire US population and 31% among all patients with dementia.¹⁹ Disease onset typically occurs when patients are between ages 50 and 60 years and is slightly more common in men.¹⁸ Pathognomonic features include a cognitive profile marked by prominent impairment in attention, visuospatial functioning, and executive functioning, as well as sleep disturbance, extrapyramidal symptoms, visual hallucinations, and fluctuations in attention and alertness.²⁰ Dementia with Lewy bodies is commonly misdiagnosed as AD, but distinct differences reliably differentiate the 2. Specifically, dementia with Lewy bodies typically results in greater impairment in attention and visuospatial ability, while AD results in greater impairment in memory and naming.²¹ Interestingly, 1 feature that may differentiate dementia with Lewy bodies from AD is an increase in daily napping, a symptom that is relatively

Table.
Neuropsychological Characteristics of Cortical and Subcortical Dementia⁵

Characteristic	Cortical Dementia	Subcortical Dementia
Language	Aphasia early	No or late-stage aphasia
Memory	Recall and recognition impaired	Impaired recall; recognition intact
Visuospatial perception	Impaired	Impaired
Frontal systems	Impairment consistent with other functions	Disproportionately impaired
Processing speed	Normal early	Slowed early
Motor speed/coordination	Normal	Slowed
Posture	Upright	Bowed or extended
Personality	Unconcerned	Apathetic, inert, irritable
Mood	Euthymic	Depressed, irritable
Disease course	Progressive and degenerative	Progressive, static, or reversible

easy for patients and their family members to identify and describe.²¹

The neuropathologic process of this dementia is Lewy body protein deposits that form throughout the cortex, paralimbic areas, and substantia nigra¹⁸; it is changes in the substantia nigra that can result in extrapyramidal symptoms. Dementia with Lewy bodies is associated with a more rapid course of progression than AD.^{18,20}

Frontotemporal Dementia

Identified as the third most common of the cortical dementias, frontotemporal dementia (FTD) is a group of heterogeneous disorders characterized by frontal cortical atrophy, temporal cortical atrophy, or both.^{22,23} A family history of FTD is seen in 20% to 40% of patients with the disease.²² Onset can occur between ages 35 and 75 years but most commonly occurs between ages 50 and 60 years.²² The most striking feature—and that which often brings patients to clinical attention—is personality change.

There are 2 subtypes of FTD.²² The behavioral subtype is most common,²² with impaired insight being a key feature.²³ When it primarily involves structures of the orbitomedial frontal lobes, the behavioral subtype manifests as disinhibited behavior, including impaired social conduct, poor impulse control, sexually in-

appropriate comments or behaviors, and violation of interpersonal space. In contrast, when the behavioral subtype involves structures of the dorsolateral frontal lobes, it manifests as passivity, amotivation, emotional blunting, poor personal hygiene, and mimicking behaviors. The language subtype of FTD has several diagnostic categories, each with its own distinct pattern of language dysfunction. The best known of these categories is Pick disease, which is characterized by impaired naming, indiscriminate eating, tactile searching, and impaired motor coordination (apraxia).²² Other language subtypes include primary progressive aphasia, semantic dementia, and progressive nonfluent aphasia, each of which involves deterioration of some important, distinct element of speech.²³

Frontotemporal dementia rapidly progresses over a 5- to 10-year course.^{22,23} The order of symptom onset is of primary importance. That is, prominent personality changes predate cognitive changes in patients with FTD, whereas the reverse is true in patients with other cortical dementias. Although memory loss is often a primary complaint, it is often not substantiated on formal testing. Likewise, early on in the disease process, impairment in other neurocognitive domains may not be found during formal testing, even when behavioral impairment is substantial.²⁴ Furthermore, in

contrast to patients with AD, patients with FTD are typically temporally oriented and can recall recent day-to-day activities.²²

Subcortical Dementias

Vascular Dementia

Vascular dementia is the second most common type of dementia. It accounts for 10% to 50% of all cases of dementia,^{25,26} with a prevalence rate of nearly 3% among US adults aged 65 years or older.²⁷ Although the term *vascular dementia* is most often thought to refer to cognitive impairment associated with large-vessel ischemic cerebrovascular disease (ie, stroke),²⁸ cognitive impairment associated with ischemic white matter lesions in small vessels is far more common.²⁶⁻²⁹

Cognitive impairment in vascular dementia may range in severity and type depending on the location and degree of tissue damage.²⁷ In cases of large vessel ischemia, symptom onset is abrupt and the resulting stroke often leaves little doubt as to cause of the vascular dementia. By contrast, cases of small vessel ischemic disease involve insidious, gradual symptom onset as lesions accumulate. Small vessel ischemic disease often results in frontostriatal dysfunction, with personality and executive function deficits occurring when lesions accumulate in the periventricular white matter. These factors can result in vascular dementia being misdiagnosed as cortical dementia, most often AD or FTD.^{27,29} Progression of small vessel ischemic disease may be slowed with aggressive treatment of the patient's vascular health. When ischemic disease does progress, it is often in a stepwise fashion.²⁷

Risk factors for vascular dementia include smoking, atherosclerosis, hypertension, hypercholesterolemia, and diabetes mellitus.²⁹ Early management of these risk factors is important. For example, when diabetes mellitus was present in middle age, rather than in advanced age, the incidence of dementia increased significantly in study of Swedish twins.³⁰ Similarly, other studies^{29,31} have revealed that treatment of patients' hypertension and hyperlipidemia in middle-aged adults was associated with improved cognitive function and reduction in the development of vascular dementia.

Dementia Due to Parkinson Disease

Individuals with Parkinson disease can develop slowly progressing dementia, typically later in the disease process (on average 10 years from the onset of Parkinson disease).³² Cognitive changes that occur within 1 year of onset of motor symptoms in these patients are likely caused by dementia with Lewy bodies rather than dementia due to Parkinson disease.³³ For patients with dementia due to Parkinson disease, the incidence of dementia increases with greater physical impairment. Furthermore, dementia is more pronounced when rigidity is the most prominent symptom and less pronounced when tremor is the most prominent symptom.³²

In dementia due to Parkinson disease, the cognitive profile is notable for predominant executive dysfunction, as well as impairments in attention, visuospatial functioning, and memory.³² Some research suggests that the extent of executive dysfunction may be an important predictor of later cognitive decline.³⁴ Overall prevalence of dementia in patients with Parkinson disease is approximately 30%; this prevalence increases to 48% after 15 years from initial diagnosis.³²

Patients with dementia are able to live at home longer and have improved quality of life when their care involves family members.

Not to be confused with Parkinson disease, parkinsonism is a syndrome characterized by the presence of at least 2 of 6 Parkinson disease–like motor symptoms (ie, bradykinesia, resting tremor, rigidity, loss of postural reflexes, flexed posture, and freezing), with either bradykinesia or resting tremor being 1 of the symptoms present.³⁵ It is associated with no or minimal cognitive changes that are likened to an exaggeration of the normal cognitive changes associated with aging.³⁵

Osteopathic Approach to Caring for Patients With Dementia

Osteopathic physicians' focus on treating the whole patient makes them particularly well suited to address the needs of patients with dementia. The underlying philosophy of osteopathic medicine includes 4 basic tenets:

(1) the body is a unit (the body is a unit of mind, body and spirit), (2) the body is capable of self-regulation, self-healing, and health maintenance, (3) structure and function are reciprocally interrelated, and (4) rational treatment is based on an understanding of the basic principles of body unity, self-regulation, and the interrelationship of structure and function.³⁶ By necessity, a patient-centered, collaborative, and integrated approach is best practice in the care of patients with dementia.³⁷

The implications of a dementia diagnosis are substantial and far-reaching not only for the patient, but also for the patient's family. As previously mentioned, impaired insight is a common feature of many types of dementia. Because the patient's understanding and awareness of his or her impairments is inherently compromised, family involvement is essential not only in understanding diagnosis and prognosis, but also in implementing appropriate care and in ensuring the well-being of the patient. In addition, it is well documented that compared with patients who do not have the support of family caregivers, patients with dementia are able to live at home longer and have improved quality of life when treatment involves support and education of family caregivers.³⁷ Therefore, it is important for the physician to develop a partnership with the patient and the patient's family and interact with them on a personal level. In the following sections, we review various ways in which osteopathic physicians can establish this partnership and position themselves to provide optimum care.

Changing Roles

Patients and their families face many changing roles as dementia progresses. Family members often assume the role of primary caregivers or guardians and therefore must be informed of the patient's status at all times. Patients with dementia usually do not completely understand their diagnosis, prognosis, and treatment options. Thus, physicians should discuss these topics with the patient's family present, but with careful attention to ensure the patient does not feel excluded or marginalized in his or her own medical care.³⁸ The patient should contribute to his or her own health care decisions to the degree that he or she is able.

In addition to discussions regarding health care, physicians must facilitate sometimes difficult patient-family discussions regarding safe housing, living wills, and end-of-life care.³⁹ Often, these discussions are avoided by families and physicians until they are forced by patient decline in physical and cognitive health that may ultimately lead to an unsafe living environment. When such decisions are made on an urgent basis, it becomes difficult for the physician to guide emotionally torn family members through choices regarding the patient. Physicians should initiate early discussion with the patient and the patient's family to ensure the patient's wishes and best interests are considered in all decisions.

Lifestyle Changes

Issues such as preparing for and accommodating expected functional decline are important for physicians to address. Because of impaired insight, patients may not understand that certain activities are no longer safe for them to do (eg, driving, cooking, using power tools).³⁷ Likewise, patients usually do not understand the need for increasing supervision and hence are very vocal in their wish to remain in their own home. This wish can lead to tremendous family guilt and delay needed care. Early discussion and education about preparing for the patient's impaired insight as it relates to functional impairment and care needs are also important.³⁷

Education

Education has been consistently supported as one of the most essential factors in ensuring the well-being of patients and family caregivers, slowing symptom decline, and preventing caretaker burnout.^{17,37} Care teams led by physicians and including care managers, support groups, and nursing staff should provide education and information about community resources. For example, care teams may provide written information on the diagnosis and natural course of dementia, treatment options, local support systems, and medico-legal support.³⁷ Thus, physician-led education can play an integral role in improving quality of life for patients with dementia and allowing patients to live in their communities longer.^{37,39} Osteopathic physicians readily establish themselves as a

trusted source of information and knowledge when they take the time to educate patients and patients' families about the disease, its progression, its associated functional and cognitive decline, and the need for support and open, ongoing communication.

Networking

Physicians can provide support to family caregivers by referring them to community resources (eg, nursing homes, adult day activities, hospice). Peer networking and support groups can effectively provide psychosocial support for both patients and caregivers.³⁷

Environmental Safety

Physicians play an important role in ensuring patient safety in the home environment (eg, ability to cook, ability to bathe) as well as in the community (eg, ability to drive). By putting appropriate supports in place in the home environment, the length of time patients can live in their home is extended, thus improving patients' quality of life.³⁷ Physicians can refer patients to occupational therapy professionals for recommendations on how to ensure adequate safety at home (eg, installation of handrails, removal of rugs) and on the road (eg, ability to drive). Furthermore, given that many types of dementia are associated with impaired motor skills, physicians should assess patients for fall risk to decrease the likelihood of secondary injuries. Safety measures can be implemented based on the individual's identified risk and the recommendations of the occupational therapist.

Behavioral Complications

Behavioral symptoms (eg, agitation or aggression, depression, hallucinations, delusions) are common in patients with dementia and are associated with poorer outcomes, including earlier patient placement outside the home compared with that of patients without behavioral symptoms.³⁹ Behavioral symptoms are particularly difficult for family members already burdened with caring for patients. Affective symptoms, particularly depression, can further burden family. Indeed, dementia-related behavioral concerns result in a far greater number of visits to the physician than do medical concerns.³⁹ Pharmacologic intervention is often the first line of treatment

for patients with behavioral issues. However, nonpharmacologic interventions are essential as well. Assessing for environmental triggers of behavioral upset, referring patients to in-home support services, and arranging respite care to relieve stressed caregivers are all important interventions for behavioral complications.

Health Maintenance

Common comorbid conditions (eg, sleep problems, depression, delirium, psychosis) must be monitored in patients with dementia.³⁹ As cognitive and functional impairments progress, medication compliance often decreases, leading to an exacerbation of dementia symptoms and other medical concerns. Reducing cardiovascular risk factors (eg, hypertension, hyperlipidemia, diabetes mellitus) is critical to preventing the exacerbation of cognitive changes.³⁹ Furthermore, physicians should be aware of medication interactions and avoid polypharmacy to prevent exacerbation of impairments.

Conclusion

Dementia diagnosis and care pose a unique challenge for physicians. With the rapidly rising prevalence of dementia, physicians need to be well educated as to the different types of dementia, as well as the approach to caring for those with dementia. Caring for patients with dementia is different from caring for patients with other medical diagnoses in that care must focus on both the patient and the patient's family caregivers, and it must be proactive in nature. Using an osteopathic approach to the care of patients with dementia will help improve outcomes and satisfaction of patients and caregivers.

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