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Early-Stage Dementia Diagnosis and Care

Dementia caused by Alzheimer's disease and other factors is taking a tremendous toll on elders and their families. However, if the disease is diagnosed and treated early, many patients can avoid or delay secondary medical and social complications.

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In 1907, a German clinician, Alois Alzheimer, first described symptoms of a disease characterized by progressive and unrelenting memory loss that correlated with marked decreased brain size at autopsy.¹ The disease was described as a presenile illness and considered relatively rare. Now, with the exception of relatively uncommon familial forms, it is acknowledged to be primarily an illness of the aged.

In the United States, the prevalence of dementia in those aged sixty-five or greater is five to ten percent, the majority of which is caused by Alzheimer's disease. The virtual epidemic of the disease is related to the fact that from age sixty to eighty-five there is a doubling of dementia prevalence every five years, until at age eighty-five, the disease prevalence is between thirty to fifty percent.² Dementia has also been found to exist in every country where it has been seriously studied and where the population survives into old age. It affects an estimated four million people in the United States.³ Between 2010 and 2050, the number of people with Alzheimer's will increase from about five and a half million to fourteen million, as the baby boomers enter the age of highest risk. Worldwide, dementia is a leading cause of morbidity, affecting more than fifteen million people.⁴ While research has yielded a great deal of knowledge about the pathophysiology of this illness, to this day dementia is, by and large, incurable.

At least half of individuals who live to eighty-five years of age maintain normal memory and thinking. However, with a prevalence of some form of dementia as high as fifty percent at age eighty-five, many incorrectly accept dementia as a normal part of aging. While dementia may be common, it is definitely not to be considered an inevitable consequence of aging.

Some other forms of dementia, such as that due to stroke or brain trauma, may be easier to think about as preventable or treatable. However, current research in Alzheimer's disease holds out promise for the discovery of modifiable risk factors and disease-modifying treatment. With increasing numbers of people living into old age, the devastation it causes in the lives of individuals and families, and the costs of care, dictate that the disease be approached aggressively for prevention, treatment, and cure. A significant barrier is failure to make a diagnosis early in the course of illness, which leads to preventable secondary medical and social complications.

This article will review significant aspects of early dementia diagnosis and treatment. It will concentrate on the importance of early diagnosis with respect to education for patients and families, safety issues, and providing patients with an opportunity for self-determination prior to the loss of decision-making capacity.

Definition of Dementia and Mild Cognitive Impairment

Definition and Staging of Dementia

Dementia is a clinical diagnosis made using defined criteria based on standards of normative adult cognitive performance. While there are several sets of defined criteria, the Diagnostic and Statistical Manual of Mental Disorders is most commonly referenced (DSM-IV).⁵ Findings required for a DSM-IV criteria-based diagnosis include the presence of acquired memory impairment, either in short-term memory or long-term memory, and an abnormality of one other area of cognitive function, such as abstraction, visuospatial skills, attention, language, judgment, insight, or personality. The diagnostic requirement for the deficits to be acquired is intended to distinguish the diagnosis of dementia from that of developmental disability and congenital abnormalities.

The evaluation must also assess for reversible situations, such as the use of mind-altering substances (e.g. medications or alcohol), which if eliminated, could reverse the abnormalities. These situations are typically marked by acute or subacute deficits in attention, a condition termed delirium. It is difficult to make a diagnosis of dementia with confidence in individuals who have a delirium. This can be a particularly difficult issue given a predilection for

delirium to occur in individuals with dementia.⁶ When delirium is superimposed, it can make the dementia symptoms markedly worse in a short period of time. Depression is another underdiagnosed common condition that can cause reversible deficits in cognition.⁷

Dementia is typically staged as mild, moderate, or advanced. Standardized criteria are used in research—however, clinical acumen is typically the basis for staging in medical practice. Mild disease is characterized by continued ability to function in most daily activities, limited by a mild and often unrecognized decrease in memory and thinking ability. This memory deficit is often described as “forgetfulness.” In a social context, one can often continue to function without significant problems, thus making the diagnosis more difficult and recognition by family members delayed.⁸

As an individual progresses to the moderate stage of dementia, forgetfulness is more apparent and behavioral issues may arise including getting lost in familiar surroundings, asking the same questions over and over, or developing psychotic symptoms such as paranoid delusions or hallucinations. In this stage, family members often seek medical attention for the patient mainly because of problem behavior and compromised judgment. Patients themselves often lack insight into their disease and may deny symptoms. At this point, it is typically more difficult for patients to weigh the benefits and risks of their decisions.

In advanced disease, patients have difficulty with daily activities and usually require twenty-four-hour assistance and supervision. People with dementia often have disrupted sleep patterns, making their care more difficult for family caregivers. Bowel and bladder habits may become disrupted, which can lead to incontinence. The stress of providing constant twenty-four-hour supervision and disturbed nighttime sleep often result in significant health risks for family caregivers, who often seek institutional placement for the patient.⁹

The loss of capacity to make competent decisions is a uniform finding in advanced disease. In very advanced disease, patients typically lose most communication skills and are unable to complete simple tasks such as feeding and toileting themselves.

Types of Dementia

The terms “Alzheimer's” and “dementia” are often used interchangeably, yet Alzheimer's disease is only

one of several conditions that cause dementia. Dementia is a term that encompasses a number of diseases characterized by cognitive decline. The confusion between these terms may stem from the high prevalence of Alzheimer's disease, the most common type of dementia in the United States. As a single process, it accounts for more than half of all reported dementia cases.¹⁰ In people of European descent, Alzheimer's disease is more commonly the etiology of the dementia than among people of Asian descent, where hypertensive stroke-related dementia is more prevalent than in whites.¹¹ The actual prevalence of various types of dementia in any given population is related to various factors, including genetic inheritance of the disease or a predisposition to it, and the prevalence of hypertension and stroke.

Several other diseases lead to dementia and are important with regard to early detection and treatment. Of these conditions, vascular dementia is the most common. In this disorder, there is a compromise of the vascular supply to the brain. Examples include the vascular occlusion or intracranial bleeding that occurs with stroke, either large-vessel stroke that may be clinically apparent, or small-vessel stroke that may go unnoticed until there is an accumulation of multiple small strokes leading to changes in personality and problems with memory and thinking. To a trained clinician, there are salient differences in the presentation, clinical findings, and disease course that can distinguish vascular dementia from Alzheimer's disease. To a friend or family member of a person afflicted, however, the distinctions can be unclear and the disease course can appear fairly similar. In some series, vascular dementia accounts for as much as thirty percent of dementia cases and is a contributing factor to an additional twenty-one percent.¹²

Pertinent to the early diagnosis and treatment of dementia are a number of conditions or diseases that cause cognitive impairment and can be corrected or improved if discovered early.¹³ Some of these include metabolic abnormalities such as abnormally low or high thyroid function, excess alcohol consumption, and vitamin B12 deficiency. Infections (neurosyphilis), dysfunction in flow of cerebrospinal fluid as seen in normal-pressure hydrocephalus (NPH), undetected seizure disorder, and a subdural hematoma (SDH), are other possible reversible conditions that can lead to cognitive decline. Early detection of disease and medical assessment for reversible etiologies

is the mainstay to reversing or improving symptoms related to these conditions.¹⁴

Definition of Mild Cognitive Impairment

Mild cognitive impairment (MCI) is a relatively new term used to describe subtle changes in memory and thinking at a level that is not sufficiently impaired to meet diagnostic criteria for dementia.¹⁵ While definitions for MCI have varied, they generally include a subjective complaint of memory problem with some objective evidence of decline in ability to think or remember. Data on outcomes for persons with this diagnosis are limited. As many as half of the people with MCI have been found to progressively worsen to the point where a diagnosis of dementia is made.¹⁶ When more strict criteria are used, the percentage of individuals who progress to dementia is somewhat greater, approaching one hundred percent.¹⁷ Nevertheless, it appears that dementia is not a uniform outcome. As such, MCI can be viewed as a significant risk factor for dementia. It is currently the earliest stage in which individuals could be defined as at risk for developing dementia and has therefore become an increasingly important target for research in disease-modifying treatments.

It is useful to think of the term "dementia" to include a number of conditions and a range of severity, from minimal symptoms to advanced disease. Seen in this light, it becomes apparent that an afflicted individual will eventually lose ability to perform all tasks independently. It is equally apparent that individuals with mild disease may initially retain the ability to perform many tasks.

Individuals with dementia have variable degrees of impairment in each domain of thinking; this provides heterogeneity in presentation and progression of disease and makes it necessary to view all cases individually. Given anticipated changes over time, it is important to continually assess the ability to perform individual tasks. These are important concepts to understand when considering issues of independence, driving safety, decision-making ability, and rights of self-determination.

Epidemiology of Dementia

An estimated five to ten percent of the U.S. population is affected by a dementing disorder.¹⁸ Advanced age is by far the greatest risk factor for developing dementia. As above, there is a doubling of the prevalence with every five years of advancing age from

less than one percent for people less than sixty years of age to a rate approaching fifty percent for people over eighty-five. There are limited data on the most aged elders, making it difficult to know the exact prevalence of disease in this group.¹⁹ Given marked association to advancing age and the increase in the numbers of older persons, there is a great potential for exponential growth in the numbers of persons with dementia in the coming decades.

There are several factors that may impact upon the changes in the prevalence of dementia, however. For example, there is a growing body of evidence that intellectual stimulation and maximal educational attainment may delay time to onset of clinical symptoms of dementia.²⁰ There is not enough evidence as yet to absolutely confirm this finding or define magnitude of any effect. If it holds true, an impact leading to a decreased prevalence could be seen, given that, by and large, younger people are better educated than the current generation of older people.

It is also possible that advances in treatment or prevention will be made that will have a significant impact on prevalence. For example, current treatment options for Alzheimer's disease, including cholinesterase inhibitors, can attenuate symptoms of this disease for a period of time in some patients.²¹ These medications appear to work better when started in the mild to moderate stages of the disease. With better and earlier diagnosis and more effective treatments, prevalence rates could be greatly improved. Since there is a doubling of the disease every five years after the age of sixty-five, treatment that could delay the onset or slow the progression by five years could result in reducing the prevalence by as much as one-half. Because the mortality from many other conditions also increases with advancing age, any slowing of progression of dementia would lead to a significant decline in the prevalence of moderate and advanced disease. The social impact of a decline in the prevalence of advanced dementia cannot be overstated. As a rule, older people fear losing their cognitive abilities more than they fear dying.

The cost of caring for people with dementia is substantial. Several analyses have suggested the total direct (patient-care expenditures) and indirect (unpaid in-home care) annual costs to care for a person with Alzheimer's disease are \$35,000 or greater.²² In 1991, minimum estimates of long-term dollar losses to the U.S. economy due to Alzheimer's disease were \$536 billion (direct) and \$1.75 trillion

(total).²³ A study by the Lewin Group for the Alzheimer's Association shows that within ten years, the cost to Medicare of treating people with Alzheimer's disease will soar from \$31.9 billion in 2000 to \$49.3 billion in 2010.²⁴ The report shows a similar impact on Medicaid, with program expenditures for nursing-home care for people with Alzheimer's disease increasing from \$18.2 billion in 2000 to \$49.3 billion in 2010.

These numbers highlight the substantial direct costs involved, but there are also considerable indirect costs, particularly the costs to caregivers who miss work or leave jobs entirely to care for affected family members.

Regardless of the changes in disease prevalence, it is likely that the social and economic costs of dementia care will remain significant. It is hoped that advances in research will keep these costs from reaching epidemic proportions.

Early Diagnosis of Dementia

The foundation of the medical profession lies in the ability to prevent or detect medical illness and to provide treatment to reduce suffering and early death. In this capacity, the desire to cure is a driving force. Because of the high prevalence of chronic diseases for which no cure currently exists, the ability to cure is reduced for physicians caring for older patients. In contrast, there is often the potential for reducing pain and suffering and delaying the complications of these conditions, as seen with treatments for osteoarthritis, congestive heart failure, and dementia.

While dementia cannot be cured, many of the accompanying symptoms—such as depression, agitation, sleep disturbances, and psychosis—can be greatly improved with treatment. In addition, caregivers can be greatly helped with counseling, support, and referral to community resources and support groups. This is best accomplished when disease is detected early; however, early detection often does not occur.

The lack of curative pharmacological treatments may be playing a role in explaining the current low levels of clinical detection of dementia in its early stages. Investigators have suggested this as an etiology, as well as a need for better education of physicians in the detection of mild disease.²⁵ In both community settings and teaching hospitals, physician detection rates for mild disease are less than fifty percent.²⁶ Family members, as well, often overlook mild disease.²⁷

In contrast to limited pharmacological options, there are a number of non-pharmacological interventions aimed at altering the consequences of disease. Many of these interventions become less applicable with advancing disease. Examples of these interventions include providing patients with an option of self-determination through advanced decision-making about healthcare, finances, and other personal issues. Education of patients and caregivers is important, as it can reduce worrying and suffering for everyone involved. With early detection and education, there is an opportunity to prevent unsafe or abusive situations, such as patient or caregiver abuse, financial abuse, wandering behavior, and medication noncompliance. It is important to recognize the potential for these problems and to modify the environment to protect the patient and reduce family stress and conflicts.

The hallmark of early detection is periodic cognitive function testing for persons at risk. This is not currently uniformly advocated. The United States Preventative Task Force (USPTF), which makes recommendations to care providers concerning prevention of disease, concludes that insufficient data exist to recommend periodic cognitive testing.²⁸ Among other sources, it references the American College of Physician's position recommending periodic evaluation of function in older individuals and using these data to determine who needs further testing. The Agency for Health Care Policy and Research (now called "AHCPR") of the U.S. Department of Health and Human Services recommends watching for triggers that would suggest the possible presence of a cognitive disorder and subsequently evaluating these individuals.²⁹ These triggers include activities such as missing appointments and forgetfulness—symptoms often overlooked by caregivers and family members when the disease is mild. It is not clear that this approach is sensitive enough to detect mild (early) disease.

Further controversy exists concerning the age at which to begin testing. While risk increases exponentially with age, the exact age at which testing becomes sensitive enough to do on a large scale has not been determined. The value of any screening test correlates directly to the prevalence of disease in a population. If the prevalence is too low (younger age), then the predictive value of the test decreases. On the other hand, screening an older population, while increasing predictive value, risks missing younger persons with disease.

There is also controversy concerning the tests to perform. All cognitive tests for screening must consider the balance of time to administer and test sensitivity. Tests with greater sensitivity typically require greater effort and time to complete, and thus become prohibitive as a screening tool. Shorter tests have less sensitivity.

A diagnosis of dementia is dependent upon documentation of decline in several areas of thinking, including memory. Many interactive tests have been developed to detect disease in patients. The most formal of these is full neuropsychological testing, which is prohibitively lengthy for routine clinical use as a screening tool. Short portable tests have been devised. The most common of these brief tests is the Mini Mental State Exam (MMSE) designed by Folstein and Folstein and first reported in 1975.³⁰

The MMSE is a brief test that can be performed by any trained individual. It allows the participant to obtain a maximum of 30 points. Questions are heavily weighted on orientation (10 points), however several other domains of thinking are tested including recent memory (3 points), language, attention, and visuospatial skill. It has been well validated and is probably the best known of the short mental status tests. Normal ranges have been described for various levels of education.³¹

The MMSE is not without limitation, however. While it is quite easy to perform, variations in administering the testing can lead to differing results. Standardization through proper training is important. The MMSE is a rather simple test, particularly for well-educated individuals. As a result, well-educated people can still score 30 despite the presence of cognitive decline from their baseline—so-called "ceiling effects." The MMSE lacks evaluation of several important domains of thinking, such as personality, abstraction, and judgment.

Another common test used by clinicians is the clock-drawing task.³² In this test, participants draw a clock with all the numbers on it and subsequently put the hands in the clock to indicate a designated time. The tester is able to observe the participant complete the tasks and assess several critical areas of thinking, including visuospatial skill and executive function. It does not test memory directly and serves better as a complement to a test such as the MMSE.

There are a host of other tests available. They are generally limited, however, by a lack of familiar-

ity and thus portability (the ability of having the test done reliably and consistently at a different location and time). Sensitivity varies from test to test.

All short cognitive tests should be viewed as a tool to assist in diagnosis. Appropriate diagnosis can be made only through clinician evaluation.

Treatment Options

Treatment of early-stage dementia requires a comprehensive approach encompassing not only traditional medical aspects of care, but also psychosocial needs. The result can have a tremendous impact on quality of life for an individual. There are four distinct arms to the treatment of early-stage dementia: education, opportunities for self-determination, safety, and medications.

Education

There is a remarkable degree of misconception surrounding dementia, particularly Alzheimer's disease. Patients and family members are often unaware that these misconceptions exist. Older patients tend to be less aggressive in asking questions concerning their illness, and younger family members may be uncomfortable asking some questions, particularly concerning heredity. The result can be a lack of interaction concerning these issues and added burden to the patient and family due to lack of information.

The burden to caregivers is substantial. Numerous investigations have revealed higher rates of illness in persons who care for others, including increased depression, poorer quality of life, and increased mortality.³³ Caregivers of patients with dementia tend to have a notably higher level of stress when compared to caregivers of patients with other chronic illnesses.³⁴ Models of geriatric care, such as Geriatric Evaluation and Management (GEM) units, have shown a decreased burden through increased interaction with caregivers.³⁵

An important aspect of the education is a discussion concerning an anticipated course of the illness. While many factors concerning dementia are unknown, many aspects concerning the clinical course are well understood, and others can be discussed in generality, providing practical information for families and patients.

It is known, for example, that dementia is a chronic, slowly progressive illness with a spectrum of symptoms from mild disease (where little assistance is needed) to advanced disease (where full

supportive care in all aspects of daily life is required). While the exact course for each person varies, the course tends to progress at a similar rate within individual cases. Individuals maintain an ability to perform some tasks initially; however, this ability will deteriorate as the disease progresses. This information implies a need to continually assess the ability to perform tasks and reset the ongoing balance between patient autonomy and safety for each individual. Awareness of these pieces of information allows caregivers to anticipate changes, prepare for an increased need of assistance, and prevent unsafe situations.

It is also known that some forms of dementia carry a hereditary predisposition. Families are typically keenly interested in this information. Fortunately, types of dementia with marked hereditary predisposition are relatively rare. For example, Alzheimer's disease does carry a hereditary component for individuals who develop the disease early in life (typically younger than sixty); however, the most common type of Alzheimer's disease—occurring later in life—carries a much lower degree of hereditary predisposition, which is dwarfed by the risk of increasing age.

Education to patients and family members should include information about advance directives and safety. A referral to a caregiver support group is a valuable means to increase knowledge and provide a mechanism for ongoing family support.

Advance Directives/Self Determination/ Decision-Making Capacity

The spectrum of decision-making capacity associated with dementia is wide and ever-changing for each individual. In early stages, patients typically maintain the ability to make decisions appropriately. With early detection of illness, we can provide individuals with an opportunity to indicate their values and wishes through the use of advance directives.

A challenge for medical and legal professionals is to define the point at which one loses this decision-making ability. Evaluation is necessary to balance societal needs to protect an individual from harm while maximizing patient autonomy. An important consideration for the clinician in entering into an assessment of capacity—especially when financial matters are involved—regards receiving the appropriate authority to do the assessment. That is, the patient must understand the reason for the

assessment, or an attorney representing the interests of the patient must be involved. Without such an attorney as the patient's agent, the clinician may inadvertently enter into a process that is intended to deprive the patient of assets without the patient's interests being protected. Prior to the beginning of the assessment, the clinician is well advised to obtain absolute assurance that the patient's rights are being protected. Having written confirmation from an attorney that represents the patient is an excellent way of proceeding.

Decision-making capacity is dependent upon the level of cognition required for specific decisions. This issue has been called "specific capacity." For example, patients may maintain an ability to make simple decisions long after they lose the ability to make more difficult decisions. They may be able to designate a surrogate for healthcare decisions long after they have lost the ability to understand medical or financial procedures.

Decision-making capacity should be distinguished from competence. While determination of competence is a decision of the courts, capacity refers to the ability to perform a particular task, such as making or revoking a will, deciding on a course of treatment, or completing advance directives.

Physicians are often called upon to provide an opinion regarding capacity when caring for individuals with dementia. As above, physicians should assure themselves that the patients' rights are being protected. The basic components of determining decision-making capacity include an evaluation of a patient's ability to understand the question or issue at hand, to understand and weigh the risks and benefits of the decision, to recognize alternatives, to make a reasoned decision, and to communicate that decision to the evaluator.³⁶ It is helpful to assess the continuity of the final decision with previously expressed values.

Patients should be able to express in their own words both the question at hand and the decision they make. This is particularly important when medical interventions are being addressed. A common practice for constructing informed-consent forms for medical research, for example, involves using a level of language complexity equivalent to that of the mean years of education for those intended to be enrolled, typically around an eighth-grade education level. This avoids the use of more technical jargon and maximizes the degree to which individuals can understand

aspects of the decision. The same is true in weighing risks and benefits of an intervention. An individual should be able to express these risks and benefits in his or her own words. Simple repetition of what the evaluator says can be an indication of lack of understanding and should be probed for clarity.

The setting of the evaluation should be a consideration. The individual should be relaxed and comfortable. An assessment for transient conditions, such as intoxication or use of medications that can alter thinking, should be a prerequisite. Confidentiality should be maintained for the individual, and the evaluator should ensure that communication is not an issue, as might occur with language and dialect barriers.

In early-stage dementia, patients typically maintain the ability to make many decisions. It is an appropriate time to address advance directives that help to direct future patient care before decision-making capacity no longer exists. This can be done formally through a living will and a durable power of attorney for healthcare decisions. In some states, a doctor's note in the medical record can serve as a legal advance directive. State laws vary, and clinicians should inform themselves of the laws in their states before counseling a patient about advance directives.

Safety Awareness, Including Driver Safety

One of the most significant interventions in the care of early-stage dementia is initiating mechanisms to evaluate and maintain safety. Through deterioration of thinking processes, individuals lose the capability to protect themselves from harm. Examples of common unsafe practices include forgetting to turn off a stove, leaving water running, overpaying or underpaying bills, wandering into traffic, getting lost, or being taken advantage of financially by overly zealous door-to-door salespersons or telemarketers. Unsupervised access to large amounts of cash or to valuable possessions can make a person with early dementia a target for violence and abuse. Directed interventions, such as monitoring checkbooks or limiting maximum deductions from financial accounts, can help protect assets. Other simple interventions include monitoring cooking and household tasks.

It is often beneficial to obtain an identification bracelet with information regarding contact numbers of family members if the individual becomes

lost. These are readily available through programs such as the Alzheimer's Association's "Safe Return" program or the Medic Alert program.

Another important intervention involves monitoring medication compliance and use of over-the-counter remedies. This directive would aim to decrease missed doses of medications or inadvertent overdoses that occur when patients forget that they have already taken their medications. It should also aim to minimize use of over-the-counter medications that can transiently affect thinking ability. Examples include sleeping medications, cold remedies, and anti-diarrheal medications. Use of pillboxes with daily slots for medications can be especially useful.

Driver safety is a particularly difficult issue to address. Driving is a key element to independence for most individuals and an activity that they do not readily want to give up. Physicians may not want to recommend taking away such an important function prematurely, and yet physician input is a powerful tool toward driving cessation when warranted. The assessment can be notably difficult in that a diagnosis of dementia does not universally imply an inability to drive safely when the disease is mild.³⁷ If the disease is advanced, however, driving is clearly not safe. When a relative should stop driving often becomes a heated debate for families.

State requirements for reporting differ. In some states, reporting of individuals thought to be unsafe is mandatory, while in other states, patient confidentiality takes precedence and reporting cannot occur without written consent from the patient. Formal evaluations of driving safety are available, but are often costly and are not typically covered by medical insurance. However, they are apt to be much less costly than preventable automobile accidents.

Driving evaluations often include simulated tests, road tests, or both. Unfortunately, however, the data provided are quite limited as a result of the progressive nature of the deterioration seen with dementia, which can lead to loss of applicability in as little time as six months.³⁸ Therefore, there is a need to individualize the decision with patients and their families, with an aim to discontinue driving before a dangerous situation occurs, but to maximize function as long as possible. The safest and easiest way to accomplish this involves early discussion and the implementation of options for alternative transportation. Many communities have transportation

options for the elderly that are prepared to deal with memory-impaired individuals.

Medical Therapeutics

Currently, there are several treatment options available for dementia, each with modest benefit, at best. These treatments focus mainly on symptoms of the disease without curing or halting the disease. However, the evidence is becoming clearer that the medications may slow the progression of the disease, an important cost consideration in terms of being able to delay the need for twenty-four-hour supervision or institutional care.

The Food and Drug Administration (FDA) has approved four medications in the class of acetyl cholinesterase inhibitor for the treatment of Alzheimer's disease. These medications work on the central nervous system to increase the local amount of acetylcholine, an important neurotransmitter for memory and thinking. In clinical trials, these medications have shown a statistically significant improvement in patients with disease, particularly in evaluations of daily function.³⁹ While these changes are statistically significant, they do not universally translate into a clinically notable change for all individuals. The benefit in some may be marked more by a delay in deterioration of thinking and improved behavior rather than a noticeable improvement in cognition.⁴⁰ Most of these medications are well tolerated when properly used; however, the cost is a barrier for some patients.

A number of other medications have received attention in the treatment of dementia. For individuals with a vascular etiology to their dementia, usually small or large strokes, an assessment as to etiology of the strokes—such as hypertension or cardiac arrhythmia—can prevent further deterioration by preventing future strokes. There is also evidence that low-dose aspirin may decrease the rate of progression of some forms of this disease.⁴¹

Several studies have looked at vitamin E use in patients with dementia.⁴² While there appears to be a benefit to its use, it is modest. The ideal dose has not been established, and there is a potential for complications (particularly bleeding) at high doses.

Equally unclear is the usefulness of ginkgo biloba, an extract from a deciduous tree bearing the same name. It is a well-known herbal preparation that has been used for "cerebral vascular insufficiency."⁴³ Published, well-designed, double-blind studies are

lacking, but one is currently underway. A high drop-out rate and inability to ensure that persons in the placebo group did not have access to the herb are significant limitations to current published studies.⁴⁴

There is a great deal of interest in the use of estrogen for the prevention of Alzheimer's disease. A recent well-designed study evaluating estrogen as a treatment for established Alzheimer's disease showed no benefit.⁴⁵ Whether estrogen provides a protective effect on the development of Alzheimer's disease is not resolved. Currently, available data are based on cross-sectional study designs in which individuals with and without dementia report their past estrogen use. Here, a suggestion of possible benefit is found.⁴⁶ However, this retrospective method is limiting and does not provide a definitive answer. Prospective studies, such as the Women's Health Initiative Memory Study, are underway to answer this question.⁴⁷

Epidemiological studies have indicated a possible benefit of non-steroidal anti-inflammatory drugs (NSAIDs), for delaying the onset of Alzheimer's disease.⁴⁸ This may be important, or it may simply be a statistical correlation without actual clinical benefit. NSAIDs can cause gastrointestinal bleeding and renal dysfunction, and they would need to be taken over many years to provide preventive benefit. Again, studies are underway to determine the risks and benefits of NSAIDs in the prevention, delay, or treatment of Alzheimer's disease.

Clearly, pharmacological therapy for the treatment of the cognitive impairment in dementia is limited, while there are significant numbers of non-pharmacological interventions described. This highlights the need for clinicians to address early-stage dementia care in a comprehensive manner that includes a discussion of psychosocial needs.

Future Trends

Although dementia is much better understood than in the past, currently more questions than answers remain. A considerable amount of research is ongoing; however, given the personal and societal impact, much more is required. Alzheimer's disease, vascular dementia, Parkinson's dementia, and other dementias are age-related, but not age-inevitable, diseases. The impact on individuals, families, and society is tremendous.

Given the aging of the population, without extensive research into prevention and intervention, the

world is facing a medical and social crisis. However, because of the marked increased risk for each half-decade of life over sixty, delaying the onset of Alzheimer's disease by even five years could result in reducing by half the number of people who will be affected.

A promising vaccine therapy in mice models could have a tremendous impact on dementia care and prevention in the future.⁴⁹ Discoveries about preventable risk factors would be significant. It will be critically important to determine whether estrogens, NSAIDs, ginkgo biloba, vitamins, or other substances can actually delay—with an acceptable level of safety—the development or progression of Alzheimer's disease.

The success of disease intervention, now and in the future, will depend upon the ability to detect early-stage dementia, evaluate for confounding and reversible conditions, and institute a comprehensive plan aimed at treatment, prevention, and monitoring. This process involves not only healthcare professionals, but also individuals from multiple disciplines, including family members, financial advisors, and legal professionals.

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