Chapter 1

Understanding Dementia and Alzheimer’s Disease

Chapter Question:
Is there a difference between dementia and Alzheimer’s disease?

The term *dementia* is used to refer to a medical condition that involves the progressive loss of intellectual abilities. Although there are many types of dementia, Alzheimer’s disease (AD) is by far the most common dementia. Chapter 1 discusses several definitions of dementia and AD in some detail.

A BRIEF HISTORY OF ALZHEIMER’S DISEASE

Science has come a long way since 1907, when Dr. Alois Alzheimer first published a description of what he saw under the microscope when examining the brain of a patient who died of dementia in her 50s. At first, what is now known as AD was referred to as *presenile dementia*, a diagnosis reserved for patients under 60 to whom the more common illness of *senile dementia* did not seem to apply. Current convention does not distinguish presenile from senile dementia because there are no fundamental differences in disease pathology. As medicine has developed into an organized system of diagnoses based on behavioral, anatomic, and physiologic characteristics, so has AD developed into a dementia diagnosis with specific clinical presentations and biological markers.

1
DEFINITIONS OF DEMENTIA AND ALZHEIMER’S DISEASE

Although many people have a rudimentary understanding of the meaning of dementia, most are not aware of the potential causes or what key factors distinguish one form of dementia from another. Consequently, when a person is presented with a diagnosis of Alzheimer’s disease, often one of the first questions posed by the patient or family is: “What exactly is Alzheimer’s disease, and how is it different from dementia?” It is useful to review the definition of dementia, because AD is a form of dementia.

According to Mesulam

M. Marsel-Mesulam, an esteemed behavioral neurologist from Northwestern University, has defined dementia as a “progressive decline in intellect and/or comportment, which causes a gradual restriction of customary daily living activities unrelated to changes of alertness, mobility, or sensorium.” At first, this explanation may seem overwhelming, but it becomes more manageable when each part is considered separately. Additionally, it is important to keep in mind that this is a definition of a clinical syndrome. This means that, initially, the most relevant information comes from the patient’s medical, occupational, and social history, as opposed to the lab tests or radiologic procedures that may be necessary later.

The first part of Mesulam’s definition states that dementia is a “progressive decline in intellect....” Progressive refers to the time course of the illness. With regard to dementia, changes are generally noticed over months to years, as opposed to hours or days. The word progressive is important, because a person with AD, for example, tends to gradually but steadily decline. On the other hand, a relatively sudden intellectual decline in a previously normal person is not likely the result of demen-
Dementia, but rather of some other medical condition, such as a stroke or drug intoxication.

The next word in Mesulam’s definition is decline. This word distinguishes dementia from mental retardation, which occurs at or near birth. Dementia is an acquired condition whereby a person has attained a certain level of intellectual achievement, which then changes for the worse. That does not mean that mentally retarded people are immune to dementia. In fact, the observation that people with Down’s syndrome may experience a decline in cognitive ability as they live into their 30s and 40s (the upper end of their life expectancy) is an important clue to understanding the development of AD. Sometimes it can be difficult to distinguish if a person with baseline low intelligence and/or limited education has a superimposed dementia. In these situations, careful documentation of the person’s previous achievements is critical to decide whether a decline in their abilities has, in fact, occurred.

The last word in this part of the definition is intellect. Intellectual abilities include a collection of cognitive functions that may be affected separately in dementia. Cognitive function refers to memory, language, spatial reasoning, and executive function, among others. Within each cognitive domain there are various subdomains that can also be differentially affected by the disease. For example, memory is often divided into sensory, short-term, and long-term. Executive function refers to the ability to plan ahead, understand future consequences, and make appropriate decisions. Clinicians use bedside tests of mental status to get a rough idea of a person’s abilities in these different areas. A more in-depth examination may be requested, however, over the course of the illness.

Mesulam not only includes intellect, but comportment as something that can be affected either alone or in addition to the aforementioned intellectual domains. In general, comportment refers to a person’s behavior during social interactions. Appropriate responses in social situations require normal functioning of the frontal lobes of the brain. One of the more common non-Alzheimer’s dementias that affects social reasoning abilities is called frontotemporal dementia. The first symptoms of Pick’s disease, one type of frontotemporal dementia, are specific problems related to social behaviors, while leaving other intellectual abilities initially unaffected.
Alzheimer’s Disease

These changes or a decline in social and/or intellectual properties in turn “cause a gradual restriction of customary daily living activities....” Although it is not easy to precisely define the activities of daily living, this important component is necessary for the diagnosis of dementia. It prevents people from being labeled demented just because they have difficulties solving complex mental problems, but report no problems in conducting their day-to-day activities. Unfortunately, deciding exactly how much deterioration in a person’s ability to balance a checkbook, drive a car, or plan a shopping trip, for example, is necessary for the diagnosis of dementia has proved complicated. Certainly, at some point it becomes painfully obvious that a person is impaired in these abilities, but the boundary between normal and impaired is a fuzzy one.

The degree of deterioration is not the only difficult decision involved in diagnosis; the use of the term customary may differ significantly from one person to the next. For instance, an individual regularly participating in more demanding activities, such as their job, may notice more subtle changes when they occur. Another individual may have to experience rather substantial declines in ability before recognizing their importance. Regardless, it is clear that the dementing process must have started before it reached the point where it began to affect daily activities. It may go undiagnosed or even unnoticed, however, until daily living skills are impacted.

Lastly, Mesulam notes that the restriction in daily living activity is “unrelated to changes of alertness, mobility, or sensorium.” These three exclusions are crucial for ruling out other possible diagnoses. The first exclusion, and perhaps the most important, regards alertness. Alertness provides the key distinction between dementia and delirium. Delirium is an acute confused state characterized by fluctuating levels of alertness, hallucinations, and alterations in sleep-wake cycles, among other symptoms. It is most commonly seen in the hospital setting, and elderly
patients are at high risk for developing delirium. Many causes may account for a delirious state, including the effects of medication, infections, and alterations of body chemistries, such as sodium and calcium blood levels. Delirium is reversible with the correction of underlying problems, as opposed to dementia, which, except in relatively rare circumstances, cannot be reversed. Unfortunately, patients with dementia are especially susceptible to delirium, often complicating treatment.

The second and third exclusions refer to mobility and sensorium—meaning “of the senses.” A person who suffers from a medical condition that limits mobility (for example, arthritis) may have some trouble performing daily tasks. Likewise, poor vision may also limit activities such as driving or balancing a checkbook. These limitations should not be confused with the problems of conducting customary daily living activities resulting from dementia. Unfortunately, the process of sorting out responsibility can be complicated by multiple potential causes. For example, someone who has arthritis and vision loss may also suffer some cognitive impairment that limit activities.

Alzheimer’s Disease Definition According to the *Diagnostic and Statistical Manual*

The *Diagnostic and Statistical Manual, 4th Edition* (DSM-IV), published by the American Psychiatric Association, has officially recommended a set of criteria for Alzheimer’s disease that has been widely endorsed. These criteria pose a major problem for the clinician, however, because it requires that a person have *both* memory and at least one additional cognitive disturbance in order to be diagnosed with AD. This is more restrictive than Mesulam’s definition, which simply requires a decline in intellect, but does not specify any further characterization of the deficits. The difficulty in using the DSM-IV’s criteria centers on a group of patients who have a clear gradual decline in memory, sufficient to cause disability, but no other demonstrable cognitive disturbances. This condition has been called *isolated amnestic syndrome*. However, upon postmortem examination, many of these patients have been proved to have AD, although, on occasion, other diseases such as small strokes may be present.
The DSM-IV’s more restrictive criteria may also affect patients in the early stages of AD. In some cases, the diagnosis of AD is not given because only memory deficits are present; but with time, other symptoms develop that warrant an AD diagnosis. This has the unfortunate side effect of postponing treatment in a disease where increasing evidence suggests that early intervention is important. On a more positive note, by investigating purely amnestic syndromes as possible precursors to AD, researchers may learn about the early phases of the illness and perhaps improve treatment during this period.

According to the NINCDS

These problems are largely avoided in the NINCDS-ADRDA (National Institute of Neurologic and Communicable Diseases-Alzheimer’s Disease and Related Disorders Association) diagnostic criteria for AD, which distinguish between probable and possible AD. (There is no definite AD in their classification apart from autopsy or biopsy-confirmed AD.) Patients with deficits in just one cognitive area, such as memory, would be classified as possible AD; whereas those with deficits in two or more areas qualify for probable AD. Incidentally, unlike Mesulam and the DSM-IV definitions, impaired activities of daily living are considered supportive, not required, features of an AD diagnosis. In common with the other proposed diagnostic criteria, progressive worsening and absence of disturbance of consciousness are required.

Alzheimer’s Is the Most Common Type of Dementia

There are many possible causes of dementia besides AD, including Lewy body dementia, frontotemporal dementia, and vascular dementia, as well as various neurologic and medical conditions, such as brain tumors or certain vitamin deficiencies that may cause dementia (see Chapter 6). However, studies concur that AD is by far the most common type of dementia, accounting for approximately 60 percent of cases. Vascular dementia (from stroke) is the second most common, comprising about 25 percent, and the remaining 15 percent of the dementia population is
composed of patients with various other diseases. AD is definitively dis-
tinguished from other types of dementia by the findings in the brain on
autopsy (see Chapter 7), but there are many clues that allow a physician
to distinguish AD from other diseases while the patient is alive.