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# Distinction between Dementia and Memory Decline

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**Abstract:** Although memory decline or memory impairment is a core symptom of dementia, simple memory decline accompanied by no other cognitive impairments is called amnesia, which should be distinguished from dementia. Memory impairment accompanied by disturbance of higher cerebral functions and performance is diagnosed as dementia. Amnesia can be observed even in normal elderly people, which is called benign senescent amnesia. Benign senescent amnesia should be differentiated from Alzheimer's disease in its early stage. A patient with benign senescent amnesia loses only a part of episodic memory to an insignificant degree, and has the ability of orientation, judgement, and abstract thinking. A patient with Alzheimer's disease also has a memory impairment. In this case, however, it is usually accompanied by disorientation, especially temporal disorientation, and often by delusions of having things stolen even in its early stage. It is also difficult for a patient with Alzheimer's disease to reproduce a 3-dimensional drawing even if drawing a 2-dimensional reproduction is possible. This provides a means to review the differentiation between benign senescent amnesia and Alzheimer's disease in its early stage.

**Key words:** Dementia; Amnesia; Alzheimer's disease;  
Benign senescent amnesia

## Introduction

This paper discusses the distinction between dementia and memory decline. As memory impairment is a major symptom of dementia, some readers may wonder what the title means. First of all, this title requires some explanation since it could be misunderstood.

Needless to say, memory impairment is a

core symptom of dementia. However, memory impairment accompanied by no other cognitive impairments is called amnesia, from which dementia should be distinguished. Accordingly, the "distinction between dementia and memory decline" can be paraphrased in medical terms as the "differentiation between dementia and amnesia". This is the first topic of discussion.

Secondly, cases requiring differential diag-

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Table 1 Items Common to All Types of Dementia in DSM-IV

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- A. Development of various cognitive impairments (both of the following items 1 and 2)
    - 1. Memory Disturbance (inability to retain new information, or to recall previously learned material)  
Deficits are in long- and short-term memory.
    - 2. In addition, one or more of the following cognitive disturbances should be present.
      - (a) aphasia (language disturbance)
      - (b) apraxia (impaired motor abilities despite intact motor pathways)
      - (c) agnosia (inability to identify objects or to recognize objects despite intact sensory pathways)
      - (d) disturbances in executive functioning (i.e., planning, organizing, sequencing, abstracting)
  - B. The cognitive impairments above (1 and 2) result in significant reduction of social and occupational functions and represent a significant decline from the previous functioning level.
  - C. The cognitive impairments above develop not only in the process of delirium.
  - D. The cognitive impairments above cannot be explained by diseases of the first axis. (e.g., depression, schizophrenia etc.)
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nosis between amnesia and dementia are reviewed. Common amnesia accompanied by no other cognitive impairments includes physiological memory decline in normal elderly people, which is called benign senescent amnesia (BSA). The most important dementia that should be differentiated from BSA is Alzheimer's disease in the early stage. Accordingly, BSA and Alzheimer's disease in the early stage are reviewed as the most important examples of conditions that require differentiation between dementia and amnesia. This is the second topic of discussion.

### Differences between Amnesia and Dementia

First of all, differences between amnesia and dementia will be explained. As already mentioned, memory impairment is a core symptom of dementia. But, a memory impairment with no other cognitive impairments is called amnesia from which dementia is differentiated. In other words, memory impairment is a necessary but not sufficient feature of dementia. Then, what kinds of symptoms are required for the diagnosis of dementia?

One of the most common diagnostic standards for dementia used in Japan is DSM, established by the American Psychiatric Association. This globally popular diagnostic stan-

dard is now in its fourth edition, DSM-IV.<sup>1)</sup> The previous edition, DSM-III-R specifies one of the following symptoms as a diagnostic standard for dementia; impairment of judgement and abstract thinking, impairment of higher cerebral functions such as aphasia, apraxia, and agnosia, or personality changes in addition to short-term and long-term memory impairments. DSM-IV does not specify a diagnostic standard for dementia itself, but indicates diagnostic standards for each type of dementia such as Alzheimer's disease and vascular dementia. Therefore, items common to all appear to be a diagnostic standard for dementia (Table 1).

The common items are impairment of higher cerebral functions such as aphasia, apraxia, and agnosia or performance disability in addition to short-term and long-term memory impairments. Performance ability defined as an ability to plan, organize, order, or prescind is considered to include judgement and abstract thinking specified in DSM-III-R, and to be interpreted as a more comprehensive function. Therefore, it can be said that only personality changes among items in DSM-III-R were excluded from DSM-IV. In addition, diagnostic standards specify that dementia can be diagnosed only when the reduction in these abilities is significant enough to prevent previous occupational and social activities even in the absence of delirium, and the reduction is not

caused by depression or schizophrenia.

They are almost the same as those of DSM-III-R in which "impaired consciousness" replaced "delirium", and "disorders caused by organic but not functional impairment of the brain", replaced "disorders not be caused by depression or schizophrenia." The reason why DSM-IV uses examples such as depression and schizophrenia instead of "functional causes" is that dementia is not caused only by significant organic factors but also by other factors such as drugs or hypothyroidism. Some pathology, such as hysteria, in addition to depression and schizophrenia should be differentiated from dementia.

Accordingly, memory impairment accompanied by no impairment of higher cerebral functions or performance should be recognized as amnesia, but not dementia. Amnesia develops from psychogenic causes, drugs, cerebrovascular disorders localized in the hippocampus and others. Amnesia can be temporary and curable, or persistent leading to dementia. Mild amnesia often seen in normal elderly people is called BSA.

Next, the distinction between BSA and Alzheimer's disease in the early stage is reviewed.

### **Differentiation between Benign Senescent Amnesia and Alzheimer's Disease in Its Early Stage**

BSA means conditions often observed in the normal elderly such as "leaving things behind" and "inability to immediately recall a person's name." Many people over a certain age seem to be aware of what is called "slip of memory." As Alzheimer's disease slowly develops along with aging, many of the elderly suspect that "slip of memory" is an early warning sign of Alzheimer's disease. In fact, it is often necessary to differentiate Alzheimer's disease in its early stage from BSA. What are the differences between them?

First, the detail and degree of memory impairment differ significantly between BSA

and Alzheimer's disease. First of all, while a person with BSA loses memory of only a part of events, a patient with Alzheimer's disease loses all memory of them. For example, when a person forgets in the evening what was eaten for breakfast, it can be caused by BSA. But when someone does not know whether they ate or not, they are likely to be suffering from dementia.

The characteristics of memory impairment are therefore detailed. In memory impairment caused by Alzheimer's disease, disturbance of delayed recall is the first and most significant symptom. It is different from memory decline in BSA. A test for delayed recall is included in the Revised Hasegawa's Dementia Scale (HDS-R),<sup>2)</sup> which is often used in screening tests for dementia. In this test, test subjects are asked to repeat the words "cherry", "cat", and "train" immediately after the examiner says them. Test subjects are asked to recite these 3 words again after questions asking them to calculate "100 minus 7" and "recite 3-digit or 4-digit figures backwards". The latter question is a test of delayed recall. Not only the normal elderly, but also patients with Alzheimer's disease in its early stage can repeat those words immediately after an examiner says them. With an interval of 2 other questions, however, it is easy to recall them for the normal elderly but not for patients with Alzheimer's disease. Delayed recall requiring memory recall after more than a few minutes is feasible in Alzheimer's disease.

Memory impairment is described next. Memory is divided into short-term and long-term types (it should be noted that these terms are used differently depending on the individual). Short-term memory, or immediate memory, is lost within a minute without repetition. A test asking for the immediate repetition of 3 words is a test of immediate memory. Long-term memory is further divided into recent memory sustained by the minute, hour, and day, and remote memory that is sustained for a longer period. Delayed recall is concerned with the

Table 2 Differentiation between Aging-related Memory Decline (Benign Senescent Amnesia) and Alzheimer's Disease

	Benign senescent amnesia	Alzheimer's disease
Features of memory impairment	Partial disturbance of episodic memory or word amnesia	Disturbance of memory in general (first-delayed recall)
Orientation	With no disorientation	With disorientation (first-temporal disorientation)
Other intellectual disorders	No disturbance of judgement or abstract thinking	Reduction of all intellectual capabilities
Progression	Not progressive	Progressive
Insight	Aware of memory decline	Unaware of memory decline
Degree	Mild and not affecting daily life	Affecting daily life

shortest of these. Disturbance of delayed recall can be observed even in amnesia, but not significantly in BSA. As it is disturbed in the early stage of Alzheimer's disease, it is helpful in identifying the differentiation.

Disturbance of recent memory is followed by disturbance of remote memory both in amnesia and dementia. While only a part of recent memory is disturbed to a degree that it does not affect social life in BSA, significant disturbance of recent memory is followed by disturbance of remote memory in Alzheimer's disease. Although differences between them are significant in later stage, it should be noted that only delayed recall can be disturbed in Alzheimer's disease in its early stage.

Memory can be divided into declarative memory and procedural memory depending on its features. Procedural memory is automatic memory that remains not only in amnesia, but also in dementia most of the time. Declarative memory can further be divided into episodic memory and semantic memory. Episodic memory is memory of a personal history type with temporal and spatial contexts, for example, "I remember something." Semantic memory is memory of knowledge, for example "I know something," such as the number of days in a year. While episodic memory is the first to be lost both in amnesia and dementia, only a part

of episodic memory is disturbed in BSA.

The second important difference between BSA and Alzheimer's disease is that disorientation is not observed in BSA, but it is in Alzheimer's disease. Alzheimer's disease is characterized by the early disturbance of temporal orientation. A patient with Alzheimer's disease in its early stage who maintains normal spatial and personal orientation sometimes does not know the current date or day of the week. When encountering an acquaintance, inability to recall the name is not personal disorientation, but a simple partial memory disorder. It is often observed in BSA. However, inability not only to recall the name but also to recognize who the person is, is personal disorientation, which is observed in the middle stage of Alzheimer's disease.

The third difference is that a person with BSA has insight, but a patient with Alzheimer's disease has no insight even in its early stage. Therefore, while an elderly outpatient complaining of memory loss is likely to be suffering from BSA or depression, one with less concern but is accompanied by family members or colleagues who are concerned about their memory loss is likely to be suffering from Alzheimer's disease. These differences are described in Table 2.

When it is difficult to differentiate dementia

Table 3 Working Characteristics for the Early Detection of Alzheimer's Disease

Features of dementia	Disturbance of delayed recall, temporal disorientation, disturbance of the reproduction of 3-dimensional drawings
Accompanying mental disorders	Delusions of persecution (delusions of having things stolen)
Imaging	Findings in PET and SPECT (impairment of cerebral metabolism and circulation in the temporal lobe, parietal lobe and/or posterior cingular gyrus)
Diagnostic markers	Tau in cerebrospinal fluid ↑, A $\beta$ 1-42/43 ↓, or a combination of the two

and amnesia after a review based on these points, it is important to observe the patient at a different time or different day, or to observe the progress over time. If the symptoms alter during the day, disturbance of consciousness or depression can be suspected. While memory decline does not progress over a period of a few months in BSA, the above-mentioned characteristics become significant in Alzheimer's disease.

Other accompanying mental symptoms in Alzheimer's disease such as paranoid judgement are helpful in making the differentiation. A patient with BSA searches for what has been lost, but a patient with Alzheimer's disease suspects that it is concealed or stolen based on paranoid judgement. When a person often suspects that things have been stolen, Alzheimer's disease in the early stage should be considered even if no symptoms other than "slip of memory" are observed. Additionally, it is difficult for a patient with Alzheimer's disease even in its early stage to draw 3-dimensional reproductions even though 2-dimensional reproductions can be drawn. This is also helpful in differentiating these two conditions.

In addition to these clinical symptoms, CT

and MRI, especially functional imaging such as SPECT and PET are helpful in differentiation. Furthermore, a diagnostic marker using cerebrospinal fluid has been developed (Table 3).

## Conclusion

This paper discusses differences between amnesia and dementia, and the differentiation between BSA and Alzheimer's disease in its early stage as common and important examples. Medicines for Alzheimer's disease have been developed and early diagnosis and treatment has become more important. It is hoped that this explanation will contribute to early and correct diagnosis.

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