

Roles of Consultation Organizations in the Early Detection of Dementia: From the Practices of the Community Consultation Center for Citizens with Mild Cognitive Impairment and Dementia, Nippon Medical School

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Abstract

Background: As society ages, early detection of dementia is becoming increasingly important. Many hospitals have opened memory-loss clinics, and various new approaches for early examination and appropriate diagnosis are being tried. However, these memory-loss clinics are ultimately part of the hospital establishment, implying that, in addition to the burdens of time and effort to undergo examinations and consultations, patients might have a certain psychological resistance. With a grant from the Ministry of Education, Culture, Sports, Science and Technology, the Institute of Development and Aging Science at Nippon Medical School has opened a center called the Community Consultation Center for Citizens with Mild Cognitive Impairment and Dementia, which is a dementia-related center outside the regular hospital. This center has been developing a system that makes consultations easier. We performed a retrospective follow-up study that aimed to determine how much this approach contributes to the early detection of dementia compared with outpatient visits to university hospitals.

Methods: Persons who were found to have organic brain syndrome (defined as organic diseases related to dementia, including mild cognitive impairment) after visiting the Consultation Center during the survey period were referred to as the Consultation Center group, and persons who were found to have organic brain syndrome after an initial visit to the Department of Neurology at Nippon Medical School Musashi Kosugi Hospital were referred to as the Hospital group. We compared the groups in terms of sex, age, Mini-Mental State Examination (MMSE) score, and subclassification by means of the *t*-test and χ^2 test.

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Results: Both the mean MMSE score ($p < 0.001$) and percentage of subjects with an MMSE score of 24 points or higher ($p = 0.007$) were significantly higher in the Consultation Center group than in the Hospital group.

Conclusions: Consultations can be made more casually at the Consultation Center than at hospitals. Our results suggest that more casual consultations contribute to the early detection of dementia.

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Key words: community coordination, consultation organization, dementia, early detection, memory loss check system

Introduction

With the aging of society, interest in dementia has been increasing. Early diagnosis is important, but few persons at risk have accurate knowledge about dementia, and differentiating between normal signs of aging and symptoms of dementia is difficult for both patients and their families. In addition, many persons do not seek an early diagnosis of dementia because they are in denial about the decrease in their cognitive function^{1–3}. When dementia is diagnosed early, patients and their families can obtain accurate information about the disease, can more easily deal with symptoms, and can gain access to social resources, such as caregiver services. Moreover, in cases of mild-to-moderate Alzheimer's disease, drug therapy may slow the progression of symptoms.

As the importance of early detection of dementia has increased⁴, numerous reports have been published on memory-loss consultations at hospital departments of neurology or psychiatry^{5–9}. The Institute of Development and Aging Science, Nippon Medical School, with a grant (social initiatives) from the Ministry of Education, Culture, Sports, Science and Technology, established the Community Consultation Center for Citizens with Mild Cognitive Impairment (MCI) and Dementia ("Consultation Center") in December 2007. The Consultation Center aims to develop and operate a casual consultation system that will be met with less psychological resistance from patients than are cognitive tests now administered at hospitals. The Consultation Center is housed in a separate building on the

grounds of the Nippon Medical School Musashi Kosugi Hospital.

Various activities have been implemented with the aims of disseminating the knowledge of specialists and increasing awareness of the need for coordination with medical institutions dealing with dementia. The goals of such initiatives are to ensure that information will be effectively provided by primary care physicians who treat the elderly in the community and care managers who support nursing care sites so that they can detect dementia early^{10,11}.

At the Consultation Center, dementia screening is performed with the method described below. We have also worked toward early detection of dementia by providing information to primary care physicians in the community. However, we have not yet verified the effectiveness of these activities. The purpose of this study was to determine the extent to which the Consultation Center contributes to the early detection of dementia.

Materials and Methods

Outline of the Consultation Center

Visits to the Consultation Center do not require appointments, and persons who have questions can visit any time during operating hours for free consultations. These clients are briefly interviewed by a clinical psychologist and asked about their concerns and their living situation. Next, their level of memory loss is assessed with a screening tool on a touch-screen computer^{12–14} in which clients respond to questions displayed on the screen and follow a set of voice instructions.

The score on this test correlates with that of the

Mini-Mental State Examination (MMSE)¹⁵; however, the MMSE is typically administered when clients do not obtain a given score on the touch-panel screening test. At the same time, their living situation is investigated in greater detail. If the client is accompanied by another person, that person is also interviewed. The findings are then summarized, and the information is provided to their primary care physician.

Clients are advised to visit the Consultation Center every 6 months, at which time changes in daily life and any progression of disease are confirmed through tests and interviews. Appropriate measures to deal with these developments are then discussed. The Consultation Center also responds to questions from families and both listens to concerns about care and provides information on ways to deal with people with dementia and available welfare services. Consent is obtained from the client for all these tasks.

Subjects

All persons who first visited the Consultation Center during the survey period and were subsequently found to have an organic brain syndrome were placed in the Consultation Center group. All persons who were first examined at the Department of Neurology at Nippon Medical School Musashi Kosugi Hospital and were subsequently found to have an organic brain syndrome were placed in the Hospital group. For persons in both groups who were examined multiple times during the survey period, the age and MMSE score at the time of the first visit were used in the analysis.

If a person was examined in the Department of Neurology at Nippon Medical School Musashi Kosugi Hospital after an initial visit to the Consultation Center, he or she was included in the Consultation Center group. Conversely, persons who were examined in the Consultation Center after first being examined in the hospital were included in the Hospital group. In the end, there were 150 persons in the Consultation Center group and 124 persons in the Hospital group.

Survey Period

The survey was conducted from December 5, 2007, through December 20, 2010, for the Consultation Center group, and from January 10, 2008, to September 30, 2010, for the Hospital group.

Survey Content

This survey was conducted with the retrospective method. The survey included the (1) sex, (2) age, (3) diagnosis, and (4) MMSE score. In the Hospital group, the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, text revision¹⁶, was used as a diagnostic standard, and physicians determined a diagnosis on the basis of the results of examination. In the Consultation Center group, the diagnosis of the primary care physician to whom the patient was referred, or a specialist who examined the patient after referral from that primary care physician, was used. Both surveys were completed by clinical psychologists.

Ethical Considerations

Written informed consent for the use of data in research and academic presentations was obtained from all Consultation Center clients and hospital patients in the study. If a client's cognitive function was thought to be severely impaired, informed consent was obtained from the client's family or someone who followed the client. The study content and the method of obtaining consent were approved by the ethics committee of the Nippon Medical School Musashi Kosugi Hospital.

Statistical Analysis

We compared the Consultation Center group and the Hospital group in terms of sex, age, MMSE score, and subclassification. The cut-off point for the MMSE score is 23 or 24 in general^{17,18}. Therefore, subjects with an MMSE score of 24 or greater were placed in the "MMSE \geq 24" group, and subjects with an MMSE score less than 24 were placed in the "MMSE<24" group. The diagnoses were classified as Alzheimer's disease (AD), vascular dementia (VD), MCI, and other organic brain syndrome (other). A χ^2 test was performed to compare groups in terms of sex, MMSE score (MMSE \geq 24 or MMSE<24), and

Table 1 Comparison of Consultation Center group and Hospital group in terms of sex, age, MMSE score, and subclassification

		Consultation Center group (A)	Hospital group (B)	analysis	p-value	residuals analysis
Sex	male	64 (42.7%)	45 (36.3%)	χ^2 test	0.283	
	female	86 (57.3%)	79 (63.7%)			
Age (years)	Mean \pm SD	77.9 \pm 6.9	79.0 \pm 7.0	<i>t</i> -test	0.190	
MMSE score	Mean \pm SD	21.3 \pm 4.5	18.6 \pm 5.3	<i>t</i> -test	<0.001	
	≥ 24	44 (34.6%)	21 (19.1%)	χ^2 test	0.007	
<24	83 (65.3%)	89 (80.9%)				
Subclassification	AD	85 (56.7%)	100 (80.6%)	χ^2 test	<0.001	(A) < (B)
	VD	25 (16.7%)	5 (4.0%)			(A) > (B)
	MCI	39 (26.0%)	9 (7.3%)			(A) > (B)
	Other	1 (0.7%)	10 (8.1%)			(A) < (B)

subclassification. A *t*-test was performed to compare groups in terms of age and MMSE score (mean). Subjects were excluded from the analysis if they had been evaluated with the MMSE because of low scores on the touch-panel test or if they were not found to have any disease during the survey period. IBM SPSS Statistics Verion 17.0 (IBM Corp., Armonk, NY, USA) was used to analyze the data, and the level of significance was set at 5%.

Results

During the study period, 255 patients visited the Department of Neurology at Nippon Medical School Musashi Kosugi Hospital with chief complaints of amnesia, and 124 patients were found to have an organic brain syndrome. A total of 2,080 clients (and 273 families) visited the Consultation Center; 1,183 clients scored higher than the cut-off point on the touch-panel test, and 897 (43.1%) scored less than the cut-off point and were assessed with the MMSE.

Age and Sex

The Consultation Center group comprised 64 men (42.7%) and 86 women (57.3%), with respective mean ages of 78.0 years (SD=6.6) and 77.8 years (SD=7.2) (**Table 1**). The mean overall age was 77.9 years (SD=6.9).

The Hospital group comprised 45 men (36.3%) and 79 women (63.7%), with respective mean ages of 77.7 years (SD=8.7) and 79.7 years (SD=5.8). The mean overall age was 79.0 years (SD=7.0). There were no

significant differences in sex ($p=0.283$) or age ($p=0.190$) between the groups.

Subclassification of Organic Brain Syndrome

The Consultation Center group comprised 85 persons with AD (56.7%), 25 persons with VD (16.7%), 39 persons with MCI (26.0%), and 1 person with another diagnosis (0.7%) (**Table 1**). The Hospital group comprised 100 persons with AD (80.6%), 5 persons with VD (4.0%), 9 persons with MCI (7.3%), 10 persons with other diagnoses (8.1%). A χ^2 test showed significant differences between groups ($p < 0.001$). Additional residuals analysis showed that there were significantly higher percentages of subjects with MCI or VD in the Consultation Center group than in the Hospital group. Similarly, analysis showed that there were significantly higher percentages of subjects with AD or other diagnoses in the Hospital group than in the Consultation Center group.

MMSE Score

The Consultation Center group comprised 44 persons with MMSE ≥ 24 (34.6%) and 83 persons with MMSE < 24 (65.3%). The Hospital group comprised 21 persons with MMSE ≥ 24 (19.1%) and 89 persons with MMSE < 24 (80.9%). A χ^2 test showed that there were a significantly higher percentage of subjects with MMSE ≥ 24 and a lower percentage of subjects with MMSE < 24 in the Consultation Center group than in the Hospital group ($p=0.007$).

In addition, the mean MMSE score was 21.3 (SD=

4.5) for the Consultation Center group and 18.6 (SD=5.3) for the Hospital group. A *t*-test showed that the mean MMSE score was significantly higher in the Consultation Center group than in the Hospital group ($p < 0.001$).

Discussion

In present study the mean MMSE scores were 21.3 for subjects of the Consultation Center group and 18.6 for subjects of the Hospital group. Considering that the cut-off point for MMSE is 23 or 24 in general, the values for both groups suggest the presence of disorders of cognitive function^{17,18}, and all subjects received a diagnosis of an organic brain syndrome. The Consultation Center group had higher mean MMSE scores and a higher percentage of subjects with $MMSE \geq 24$ than did the Hospital group. These results indicate that subjects in the Consultation Center group sought consultation at an earlier stage of an organic brain syndrome and probably received diagnoses earlier than did subjects of the Hospital group. These findings suggest that the Consultation Center, which people can consult more casually, contributes more than do hospitals to the early detection of dementia.

As mentioned previously, subjects in the Consultation Center group were advised to visit the Consultation Center every 6 months. With repeated patient visits, some cases of organic brain syndrome were diagnosed over time. Similarly, in the Hospital group some cases of organic brain syndrome were diagnosed during the course of repeated examinations. Results of this study show that even if no specific problem is found at the initial consultation, the visit allows persons in whom organic brain syndrome will later develop, as well as persons with existing disease, to establish ties to their community hospital.

The higher MMSE score and the higher percentage of subjects with $MMSE \geq 24$ in the Consultation Center group, together with the fact that the MMSE was not needed for many clients, show that many elderly persons are interested in their own cognitive function and visited the Consultation Center for consultations. For clients

who were assessed with MMSE because their touch-panel test score was low and clients whose information was provided to their primary care physicians, the existence of the Consultation Center contributed to their care by urging them to get regular examinations, even if they did not receive a diagnosis of dementia immediately after their initial consultation. These regular examinations possibly increased the likelihood of the early detection of dementia.

A possible criticism of this study is that the high MMSE scores and the high percentage of subjects with $MMSE \geq 24$ in the Consultation Center group resulted from the screening tests being free of charge. However, clients who were found to have organic brain syndrome ultimately bore the costs of the examination and treatment at medical institutions. We would like to stress the significance of offering persons who are anxious about (or interested in) dementia the opportunity to consult with physicians and specialists.

The results of various activities undertaken by the Consultation Center and subsequent questionnaires suggest a high level of desire among the general population for a deeper understanding of the symptoms, prevention, and treatment of dementia. Simple screening tests, such as those performed at the Consultation Center, and the interviews conducted by specialists help fulfill these needs. Moreover, the Consultation Center's location within the grounds of a university hospital is thought to provide a certain reliability (authority) and comfort, suggesting that such a "low-threshold, reliable, consultation organization" is needed in society¹⁹.

There were considerable differences between the Consultation Center group and the Hospital group in subclassifications of organic brain syndrome. In particular, the percentage of subjects with MCI was significantly higher in the Consultation Center group than in the Hospital group. The early detection and treatment of MCI are important for dementia care. Therefore, this result suggests that the Consultation Center can contribute to detecting MCI. However, caution should be exercised in interpreting the subclassification results, because the diagnoses were made by different physicians and at different

hospitals. Most importantly, persons who were or would be found to have an organic brain syndrome visited the Consultation Center with a stage of dementia earlier than that of subjects in the Hospital group.

This study had several limitations. First, the number of subjects was limited by the survey period. Next, because this study was retrospective, several important factors were not surveyed, such as complications related to dementia; extent of education, which is related to MMSE score; and whether or not subjects were living with families, a factor possibly affecting early consultation. These factors might have affected the MMSE scores in both groups. In addition, the findings obtained in the present study are from a limited number of facilities, and it is not clear whether the findings reported here can be extended to all consultation organizations for memory loss. We plan to clarify these points in future studies.

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