

An Epidemiological Study of Senile Dementia at Home in Nagasaki

Hiroyuki Sugasaki, M. D.,¹⁾ Yasuyuki Ohta, M. D.,²⁾ Shunichiro Michitsuji, M. D.,¹⁾ Yoshibumi Nakane, M. D.,¹⁾ Mariko Mine, P. H. D.,³⁾ Masao Kishikawa, M. D.³⁾

1) Department of Neuropsychiatry, Nagasaki University School of Medicine

2) The School of Allied Medical Sciences, Nagasaki University

3) Scientific Data Center for the Atomic Bomb Disaster, Nagasaki University School of Medicine

This paper reports the results of an epidemiological study of senile dementia with elderly people over 65 years old residing in Nagasaki City and rural districts of Nagasaki Prefecture and compares them to those of studies conducted in Japan. The prevalence rate of senile dementia at home in Nagasaki City is 2.88%, which is lower than that in the other areas. The prevalence rate of the rural districts in Nagasaki Prefecture is 4.3% and is close to the national average (4.38%). Looking at diagnostic classification of dementia, the ratio of multi-infarct dementia to the Alzheimer type is 0.93 in Nagasaki City and 0.61 in rural districts. They are lower than those in the other studies.

Key Words: Dementia, Multi-infarct Dementia, Senile Dementia of the Alzheimer Type, Prevalence rate.

Introduction

In 1973, The first epidemiological study of senile dementia in Japan was conducted in Tokyo.⁶⁾ Subsequently, other surveys were conducted in various regions in Japan, and many of them used similar investigating methods. Consequently, the prevalence rate of senile dementia in the population over 65 years old were reported to be between four per cent and five per cent.

The number of people with senile dementia in Japan is predicted to rise to over 1,120,000 by 2000, twice the number in 1985. Compared to Western developed countries, the percentage of old people in the population is increasing rapidly in Japan, and various social problems related to senile dementia have become unavoidable subjects to be confronted and solved.

Thorough epidemiological studies on senile dementia should provide important data to establish a health care system for old people. This paper reports the results of surveys on senile dementia at home conducted in urban area, Nagasaki City (with a population about 450,000), and rural districts consisting of Simabara City (with a population about 40,000) and 33 towns in Nagasaki Prefecture, in comparison with those conducted in other areas in Japan.

Subjects and Method

The subjects of the survey conducted in Nagasaki City were 1655 people, while the survey conducted in rural districts of Nagasaki Prefecture included 491 subjects, aged 65 years and older residing at home. These subjects were selected at random from the residents of the subject regions.¹⁸⁾ As shown in Table 1, 1454 (87.9%) of the 1655 subjects from Nagasaki City and 482 (98.2%) of the 491 subjects from the rural districts of Nagasaki Prefecture answered the questionnaires.

Table 1. Subjects and prevalence rate of dementia in Nagasaki City and Rural Districts

	Nagasaki City	Rural Districts
Subjects for first stage	1655	491
No. of answered questionnaires	1454	482
Subjects for second stage	150	49
No. of agreed to investigation	104	40
Cases of Dementia	29	17
Prevalence rate	2.9%	4.3%

The surveys were conducted in two stages. For the initial screening, the questionnaires asked about sex, age, medical history, present physical condition, abilities in everyday life, employment of public welfare services, mental function such as memory and the existence of problem behavior which strongly suggests a possibility of dementia. As the second stage, psychiatrists conducting this study visited those suspected cases with community nurses, gave the subjects' psychiatric examination and evaluated their social behavior. Subjects for the second stage evaluation were selected according to the following criteria:

1. retardation of vital functions such as sight, hearing and locomotion
2. existence of cerebrovascular disease
3. intellectual handicap such as memory loss

4. symptoms suspected of indicating psychiatric disorders

As shown in Table 1, 150 subjects from Nagasaki City were selected for the second stage. Out of them 104 subjects (69.3%) agreed for further investigation, while investigations were not conducted with 46 subjects due to death, hospitalization or refusal of investigation. From the rural districts of Nagasaki Prefecture, 49 subjects were selected for the second stage, and of them 40 subjects (81.6%) agreed, while investigation was not conducted with nine subjects.

The second stage investigation included 17 items:

1. subjects profile
2. occupation
3. past and present medical history
4. ADL (activities in daily life)
5. personality
6. senility
7. somatic findings
8. psychiatric symptoms
9. the Hasegawa Dementia Scale
10. the Huchinski Ischemic Score
11. GBS Scale
12. diagnosis of type of dementia according to DSM-III-R
13. condition of care
14. profile of the main care taker
15. profile of alternative helper
16. social welfare service
17. any other relevant information

Results

1) Prevalence Rate

As shown in Table 1, in the second stage survey of

Nagasaki City among the 104 subjects, 75 people were diagnosed as being 'normal' and 29 people were diagnosed as having 'dementia'. On the assumption that 'dementia' would be found at the same ratio (29/104) among the 46 selected subjects who in practice could not be surveyed, the prevalence rate was 2.88%. The prevalence rate of dementia calculated by the same method was 4.30% in the rural districts.

Table 2 shows the prevalence rate of dementia by sex and by age group in the surveys of the city and the rural districts. Both surveys showed a tendency for prevalence rate to rise with age. By sex in all age groups prevalence rate were slightly higher in females than in males.

2) Diagnosis of Dementia

Table 2 shows diagnosis of dementia in the surveys of Nagasaki City and the rural districts in Nagasaki Prefecture. In Nagasaki City, senile dementia of the Alzheimer type was 48.4%, multi-infarct dementia was 44.8% and unclassified dementia was 6.8%. In rural districts, senile dementia of the Alzheimer type was 58.8%, multi-infarct dementia was 35.3% and unclassified dementia was 5.9%. By sex, in males multi-infarct dementia was seen more frequently than senile dementia of the Alzheimer type, while in females the Alzheimer type was seen more frequently.

3) Somatic Complications, ADL, Neurological/psychiatric symptoms

1. Somatic complications

In both surveys, hypertension, cerebrovascular disease, joint disease and neuralgia were seen frequently, followed by heart disease, digestive organ disease and cataract.

Table 2. Prevalence and types of dementia by age and sex

Age group	Nagasaki City			Rural Districts		
	Total	Males	Females	Total	Males	Females
65-69 years	0.49	1.01	0	0	----	----
70-74 years	2.44	2.19	2.64	1.01	----	----
75-79 years	1.86	3.28	0	1.19	----	----
80-84 years	7.80	12.73	4.17	10.50	----	----
85- years	12.96	4.40	19.23	22.05	----	----
Total	2.88	3.22	2.52	4.30	----	----

Diagnosis	Nagasaki City			Rural Districts		
	Total	Males	Females	Total	Males	Females
SDAT #	48.4%	23.5%	83.3%	58.8%	25.0%	88.9%
MID # #	44.8%	64.7%	16.7%	35.3%	62.5%	11.1%
Unclassified	6.8%	11.8%	0%	5.9%	12.5%	0%

#: Senile Dementia of Alzheimer Type

##: Multi-infarct Dementia

2. Neurological findings

Neurological symptoms such as dysarthria, palsy and joint contracture were seen more frequently in patients with multi-infarct dementia than in those with the Alzheimer type.

3. Psychiatric symptoms

Psychiatric symptoms found frequently in both surveys were insomnia, depression, excitement, idea of persecution, personality change, delirium, hallucination, agitation, anxiety and delusion

Discussion

1) Prevalence Rate

As shown in Table 3, prevalence rate of senile dementia at

home in people aged over 65 years varied widely from 2.0% to 18.5% in the studies conducted in 11 foreign countries.^{2-4, 15, 16, 19-21, 24} However, excluding mild dementia, prevalence rate of moderate or severe dementia with neurological psychiatric symptoms and problem behavior were in the range from 2.0% to 6.7%.

As shown in Table 4, prevalence rate of senile dementia at home obtained in studies conducted in Japan were between 2.9% and 5.8%.^{1, 5, 6, 7-12, 14, 17, 22, 23, 25-28} Taking severity into account, prevalence rate of mild dementia were between 1.0% and 3.6% and of moderate or severe dementia were between 1.1% and 3.1%.

The explanation for the wide variation of prevalence rate in the reports from the foreign countries must wait for further investigations, but potential factors include differences in the diagnostic criteria or in evaluation instruments and survey methods.^{4, 15, 19} In the surveys conducted in Japan, similar methods, evaluation instruments and diag-

Table 3. Prevalence rate of dementia in people aged over 65 years

Area	Authors (Year)	Prevalence rate (%)		
		Mild	Moderate and Severe	Total
Scotland	Primrose et al. (1960)	----	4.5	4.5
England	Kay et al. (1960)	5.7	5.6	11.3
Denmark	Nielsen J. et al. (1961)	15.4	3.1	18.5
Scotland	Bore et al. (1976)	4.3	3.8	8.1
USSR	Sternberg et al. (1978)	1.8	2.7	4.5
Finland	Moelsae et al. (1982)	----	2.0	2.0
New Zealand	Campbell et al. (1983)	5.3	2.4	7.7
Australia	Ben-Arie et al. (1983)	5.0	3.6	8.6
Italy	Pinessi (1984)	----	2.0	2.0
Finland	Sulkava et al. (1985)	----	6.7	6.7
USA	Folstein et al. (1985)	----	6.1	6.1

Table 4. Prevalence rate of dementia in people aged over 65 years in Japan

Area	Authors (Year)	Subjects no.	Prevalence rate (%)		
			Mild	Moderate and Severe	Total
Tokyo (1)	Hasegawa (1973)	4,716	1.5	3.0	4.5
Tokyo (2)	Karasawa (1980)	4,502	1.9	2.7	4.6
Yokohama City	Karasawa (1982)	2,287	2.6	2.2	4.8
Kanagawa Pref. (1)*	Hasegawa (1982)	1,507	2.4	2.4	4.8
Osaka Pref.**	Nisimura (1983)	1,844	1.9	2.4	4.3
Gihu Pref.	Ohta (1983)	1,649	1.8	1.7	3.5
Aichi Pref. (1)	Kasahara (1983)	3,106	3.6	2.2	5.8
Hukuoka City	Suetsugu (1985)	3,883	1.9	1.5	3.4
Kawasaki City	Hasegawa (1985)	1,607	2.0	2.7	4.7
Toyama Pref. (2)	(1985)	1,327	1.9	1.1	3.0
Hokkaido [§]	(1985)	9,274	1.3	2.1	3.4
Kagawa Pref.	Hukunishi (1986)	3,754	1.0	3.1	4.1
Tokyo (3)	Karasawa (1987)	4,586	1.9	2.1	4.0
Kanagawa Pref. (2)*	Hasegawa (1987)	2,282	3.2	1.7	4.9
Nagano Pref.	Mutho (1987)	1,923	2.4	3.1	5.5
Yamagata Pref.	Oiji (1988)	1,825	2.2	2.3	4.5
Nagasaki Pref. [#]	Sugasaki (1989)	487	1.8	2.5	4.3
Aichi Pref. (2)	Kasahara (1990)	2,922	2.8	1.9	4.7
Nagasaki City	Sugasaki (1990)	1,454	----	---	2.9

*: Except Yokohama and Kawasaki City
\$: Include hospitalization

** : Except Osaka City
#: Certain Area in Nagasaki Prefecture

nostic criteria have been used, therefore the variation was rather small. The mean average of prevalence rate obtained in the surveys in Japan shown in Table 4 was 4.30%.

Table 5 shows the prevalence rate by sex and age. In males they were between 1.5% and 5.3%, and the average in Japan was 4.11%.^{1, 5, 6, 7-12, 14, 17, 22, 23, 25-28)} In females, they were between 2.5% and 6.3%, and the average in Japan was 4.63%. The prevalence rate were higher in males than in females only in four surveys (in Yokohama City, Osaka, Kanagawa, and Yamagata Prefecture). In the other surveys they were higher in females. In the age group of 65 to 69 years they were from 0.5% to 2.5% (the average: 1.06%), in the age group of 70 to 74, from 0.5% to 4.7% (2.71%), in the age group of 75 to 79, from 1.9% to 7.9% (5.08%), in the age group of 80 to 84, from 7.4% to 14.6% (11.08%), and in the age group of 85 and over, from 13.0% to 28.6% (20.32%). In all the surveys in Japan, the prevalence rate tended to rise with age.

Compared with the results in the other regions in Japan, the prevalence rate of Nagasaki City (2.88%) was lower. Particularly, the prevalence rate in females and one in the age group of 85 and over were lower. This could result from the fact that many people aged over 80 years who could not be surveyed in the second stage were included (25 out of 46 subjects who could not be surveyed were over 80, and these 18 were female). It must be presumed that many dementia cases would have been found here.

2) Diagnosis of dementia

Table 5 shows the ratio between multi-infarct dementia and senile dementia of the Alzheimer type in the surveys in

Japan.^{1, 5, 6, 7-12, 14, 17, 22, 23, 25-28)} In general, many of them reported the ratio of multi-infarct dementia to the Alzheimer type to be between 1.0 and 1.5.

In recent years some studies have reported that in Japan with the Westernization of life style the constitution of disease has been changing and the ratio of multi-infarct dementia to the Alzheimer type has gradually become closer to that in Western countries.^{8, 12, 17, 28)} Looking at the survey results over time, the ratio of multi-infarct dementia to the Alzheimer type seems to be becoming closer to 1.0.

Looking at the diagnosis of dementia by sex, in the reports of Fukuoka City, Kawasaki City, Toyama Prefecture, Hokkaido, Kanagawa Prefecture (1987), Tokyo (1987), Aichi Prefecture (1990), multi-infarct dementia was found more in males and the Alzheimer type was found more in females. The results in Nagasaki City and Nagasaki Prefecture were the same as in these reports. The reports of Tokyo (1980), Yokohama City, Yamagata Prefecture and Nagano Prefecture showed that multi-infarct dementia was found more frequently in both males and females, but in comparison of frequency of the Alzheimer type, the percentage was higher in females than in males.

Looking at the prevalence rate by diagnosis by age group, except for Tokyo (1980), in many of the surveys,^{1, 5, 7-11, 14, 25, 27, 28)} such as the one in Yokohama, the prevalence rates of multi-infarct dementia decrease with age, while those of the Alzheimer type increase with age.

Looking at the results in Nagasaki City and the rural districts in Nagasaki Prefecture, the ratio of multi-infarct dementia to the Alzheimer type were 0.93 and 0.61 respectively, and they were lower compared with the results of the other surveys in Japan. In both results the ratio of the

Table 5. Prevalence rate and types of dementia by age and sex in Japan

Area (year)	Sex		Age group (Years)					Types
	Males	Females	65-69	70-74	75-79	80-84	85-	MID/SDAT
Tokyo (1980)	3.9	5.1	1.2	3.1	4.7	13.1	23.4	2.89
Yokohama City	4.9	4.8	0.8	2.7	6.8	13.8	28.6	1.59
Kanagawa Pref. (1)*	4.7	4.9	1.8	3.8	5.0	10.8	20.8	1.70
Osaka Pref.**	4.8	4.0	0.6	3.1	4.3		16.2	1.43
Gihu Pref.	3.1	3.8	1.4	2.1	3.6	7.4	18.1	1.73
Aichi Pref. (1)	5.3	6.3	2.5	4.7	7.9	14.6	21.6	1.15
Hukuoka City	3.9	5.4	0.9	2.4	5.6	10.9	24.8	1.18
Kawasaki City	4.1	5.2	1.3	3.8	6.4	11.9	18.7	1.50
Toyama Pref. (2)	1.5	4.0	0.5	0.5	2.6	13.0	16.8	0.23
Hokkaido [§]	2.8	3.9	0.9	1.5	4.5	8.8	16.5	1.29
Kagawa Pref.	3.8	4.3	0.9	2.2	4.3	8.7	15.2	1.02
Tokyo (3)	3.9	5.1	1.2	3.1	4.7	13.1	23.4	1.32
Kanagawa Perf. (2)*	5.0	4.9	0.5	2.9	6.5	12.8	20.0	0.97
Nagano Pref.	5.3	5.7	0.9	3.2	7.1	7.6	27.3	1.22
Yamagata Pref.	5.6	3.7	---	---	---	---	---	1.95
Nagasaki Pref. [‡]	4.3	4.2	---	---	---	---	---	0.61
Aichi Pref. (2)	3.9	5.5	1.0	1.9	5.4	9.9	20.7	1.21
Nagasaki City	3.2	2.5	0.5	2.4	1.9	7.8	13.0	0.97

*: Except Yokohama and Kawasaki City

** : Except Osaka City

§: Include hospitalization

‡: Certain Area in Nagasaki Prefecture

Alzheimer types was slightly higher and the ratios of unclassified dementia and others were lower than elsewhere. This could have resulted from the fact that we have tried to give a definite diagnosis of either multi-infarct dementia or the Alzheimer as much as possible.

Collaborating investigators:

Drs. Matsunaga, F., Kawasaki, N., Fujita, C., Hamada, Y., Yoshitake, K., Kawaguchi, S., Nagata, K., Takemoto, T., Babasaki, I.

References

- 1) Aichi Pref. and Nagoya City: The report on health and daily life in the elderly.: Aichi Pref. and Nagoya City, 1991.(Japanese)
- 2) Ben-Arie, O., Swartz, L., Teggin, A. F., et al.: The coloured elderly in Cape Town.: SA Medical J. 64:1056-1061, 1983.
- 3) Campbell, A. J., McCosh, L. M., Reinken, J., et al: Dementia in old age and the need for services.: Age and Aging 12, 11-16, 1983.
- 4) Folstein, M., Anthony, J. C., et al.: The meaning cognitive impairment in the elderly.: J. Amer. Geriat. Soc 33:228, 1985.
- 5) Gifu Pref.: The report on health and daily life in the elderly.: Gifu Pref. 1984. (Japanese)
- 6) Hasegawa, K., Iwai, H., Amamoto, H., et al.: The epidemiological study on psychiatric disorder in the elderly.: Research anthology dedicated to Naotake Shinhuku, prof. Emeritus, Tokyo Jikeikai Medical School, Tokyo, 342-354, 1979. (Japanese)
- 7) Hokkaido: The report on health and daily life in the elderly.: Hokkaido, 1986. (Japanese)
- 8) Hukunisi, I., Hayabara, T., Morioka, E., et al.: Epidemiological Investigation of senile dementia at home.: Psychiat. Neurol. Jap. 91:401-428, 1989. (Japanese)
- 9) Hukuoka City: The report on health and daily life in the elderly.: Hukuoka City, 1984. (Japanese)
- 10) Kanagawa Pref.: The report on health and daily life in the elderly.: Kanagawa Pref., 1988. (Japanese)
- 11) Karasawa A.: The report on health and daily life in the elderly.: Yokohama City, 1983. (Japanese)
- 12) Karasawa A.: Epidemiology of senile dementia: Neuro-psychiatry MOOK8, Kanehara shuppan, Tokyo, 1984. (Japanese)
- 13) Karasawa A.: Clinical medicine of senile dementia: Igaku-shoin, Tokyo, 1981. (Japanese)
- 14) Kawasaki City : The report on health and daily life in the elderly.: Kawasaki City, 1985. (Japanese)
- 15) Kay, D. W. K. and Bergmann, K.: Epidemiology of mental disorders among the aged in the community.: Handbook of Mental Health and Aging, Prentice-Hall, 1980.
- 16) Moelase, P. K., Marttila, R., Rinne, U. K.: Epidemiology of dementia in a Finnish population.: Neurol. Scand. 65:541-552, 1982.
- 17) Muto, T., Kobayashi, M., Tohru, M., et al.: The epidemiological study on senile dementia in Japan.: Psychiat. Neurol. Jap. 91:783-790, 1980. (Japanese)
- 18) Nagasaki Pref. (The section of statistics): An outline of Nagasaki Prefecture: Nagasaki Pref., 1990. (Japanese)
- 19) Nielsen, J., Nielsen, J. A., Kastrup, M., Stromgren, E.: A gerontopsychiatric period-prevalence investigation in Samso.: Acta Jutlandica LV medicine series 23, 137-154, Aarhus 1981.
- 20) Pinessi, L., et al.: Primary dementias, Epidemiological and sociological aspects.: Ital. J. Neurol. Sci 5:51-55, 1984.
- 21) Sternberg, E., Gawrilowa, S.: UEer klinisch-epidemiologische Untersuchungen in der sowijetischen Alterspsychiatrie.: Nervenarzt, 49:347-353, 1987.
- 22) Sugasaki, H., Ohta, Y., Yoshitake, K., Fujita, C., Hamada, Y., Matsunaga, F., Kawasaki, N.: A socio-psychiatric study of senile dementia at home in Nagasaki prefecture.: Jap. J. of Social Psychiatry 15:101-107, 1992. (Japanese)
- 23) Sugasaki, H., Ohta, Y., Michitsuji, S., Fujita, C., Yoshitake, K., Kawaguchi, S., Nakane, Y., Nagata, K., Takemoto, T., Mine, M., Kishimawa, M., Babasaki, I.: A socio-psychiatric study of senile dementia at home in Nagasaki City.: The Kyushu Neuro-Psychiatry 18:188-198, 1992. (Japanese)
- 24) Sulkava, R., Wikstrom, J., et al.: Prevalence of severe dementia in Finland.: Neurology 35:1025-1029, 1985.
- 25) Toyama Pref.: The report on health and daily life in the elderly.: Toyama Pref., 1985. (Japanese)
- 26) Tokyo metropolitan Institute of Gerontology. Dept. of Psychiatry.: A socio-psychiatric study of senile dementia at home in Tokyo metropolitan.: Tokyo metropolitan Institute of Gerontology, Tokyo, 1981. (Japanese)
- 27) Tokyo metropolitan: The report on health and daily life in the elderly.: Tokyo metropolitan, 1987. (Japanese)
- 28) Oiji, A., Watabe, Y., Morioka, Y.: A study on the aged with dementia living at home from a standpoint of social psychiatry.: Jap. J. of Social Psychiatry 13:61-73, 1990. (Japanese)