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THE INFLUENCE OF AGE ON THE SYMPTOMS (TYPE AND SEVERITY), RECOVERY PROCESS AND PROGNOSIS OF APHASIA

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1. Introduction

Age has long been assumed to be one of the important factors affecting the prognosis of aphasic patients. However, there is no unanimous opinion on this issue; a positive relationship between age and prognosis is supported by some researchers (Eisenson[1], Marks, et al.[2], Godfrey, et al.[3], Vignolo[4]) but not by others (Sarno[5], Davis & Holland[6], Darley[7]). In recent years, evidence has accumulated that age is closely related to the symptomatic pattern, namely the frequency of the occurrence of each aphasia type (Obler, et al.[8], Basso, et al.[9], Harasymiw & Halper[10]). However, systematic investigations into the relationship between the age of patients and the severity of their aphasia or sex differences have not been conducted to date.

The purpose of the present study is to clarify how the age of aphasic patients relates to their symptoms (type and severity), recovery and prognosis.

2. Method

(1) Subjects

The subjects were 585 aphasic patients seen at the Speech Clinic of the Tokyo Metropolitan Geriatric Hospital during the period from 1972 to 1981. Their mean age at onset of aphasia was 59.9 years, with a range of 18 to 87 years (Table 1). Three hundred and thirty-one cases were above 60 years of age (hereafter called the aged group), and 254 were below 59 years of age (hereafter called the younger group). Four hundred and twelve cases were males, and 173 were females. In 96 % of the subjects, the cause of aphasia was a cerebrovascular accident (CVA). The time period between the onset of the patients' aphasia and their first visit to the Speech Clinic ranged from 1 month to 12 years, and 76.2 % of the patients were first seen within 6 months post onset. Three hundred and three cases out of the 585 received individual language therapy for at least 2 months, and the present prognostic study was based on these 303, of which 261 were right-handed with left-brain damage and without other communicative disorders. Out of the 261, 111 reached a plateau condition judged on the basis of changes in their scores on the aphasia test throughout their language therapy.

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(2) Test

For the diagnosis of type and severity and for the evaluation of the degree of recovery, the RTDDA (the Test for the Differential Diagnosis of Aphasia --The Roken Test (Sasanuma, et al.[11]), which is a revised version of the MTDDA (the Minnesota Test of the Differential Diagnosis of Aphasia), for Japanese was used. The patients were tested by speech and language pathologists and classified into diagnostic groups according to Schuell's classification system, to which the category of conduction aphasia was added. The overall test score percentage on the RTDDA was used as a measure for assessing the patients' language function. Patients who were enrolled in language therapy were examined every 3 to 5 months throughout the therapy period.

(3) Language therapy

The patients were treated using the stimulation method (Sasanuma, et al.[11]). Each therapy session generally lasted from 30 to 60 minutes, and the frequency of the treatment was 1-6 times a week. The time period between the beginning and the termination of treatment was from 2 months to more than 3 years.

3. Results

(1) Relationship between age and aphasic symptoms[11]

1) Type

The mean age of the subjects differed according to aphasic type, as shown in Table 2: (aphasia with persisting dysfluency, 52.9 years; aphasia with sensorimotor impairment, 53.1 years) (Broca's aphasia) < (conduction aphasia, 57.9 years; simple aphasia {amnestic aphasia}, 58.2 years) < (unclassified, 59.6 years) < (aphasia with intermittent auditory imperception {Wernicke's aphasia} 61.6 years) < (irreversible aphasia {global aphasia}, 66.3 years). (The symbol "<" represents a significant difference.)

Figure 1 shows the frequency distribution of the patients with Broca's aphasia and Wernicke's aphasia in each age-group expressed in the form of a profile. The abscissa indicates the age-group and the ordinate shows the frequency. The solid line represents Wernicke's aphasia and the dotted line Broca's aphasia. It is evident from Fig. 1 that the profile was quite different for the two aphasia groups. The mean age was 53.0 years for Broca's aphasia, 61.6 years for Wernicke's aphasia, and this difference was statistically significant ($p<0.05$).

Figure 2 illustrates the relationship between the incidence of the type of aphasia and age. The solid line was obtained by plotting the frequency distribution of the types in each age-group, and thus represented a so-called profile of the

normalized incidence for each type of aphasia. (It does not indicate the frequency distribution per se of each patients' group with certain type of aphasia for each age-group.) The incidence was closely related to age in some aphasic types but not in other types. That is, the number of patients with irreversible aphasia increased with age, while the number of patients with aphasia with persisting dysfluency, aphasia with sensorimotor impairment and simple aphasia decreased. As for the remaining types, an age-related tendency was not found.

2) Severity

The evaluation of the severity of language deficit was based on a study of 275 cases out of the 585. These 275 satisfied the following three conditions: (1) they were without other communicative disorders; (2) they were seen within 6 months between the onset of aphasia and their first visit to the Speech Clinic; and (3) they had not received language therapy. Figure 3 shows the mean percentage of the overall test score in each age-group at the beginning of treatment. As is obvious from the figure, there was a tendency for the severity of aphasia to increase with age. While the mean percentage of the group under 39 years was 62.2%, that of the group over 60 was 42.9%. A statistically significant difference was observed between the group over 50 and those over 60 ($p<0.05$).

Figure 4 shows the severity of each type of aphasia in terms of a comparison between the aged group and the younger group. An age difference in severity was found in some aphasia types but not in other types. The severity of the aged group was significantly greater than in the younger group in simple aphasia ($p<0.05$), as well as in aphasia with intermittent auditory imperception ($p<0.001$).

3) Sex differences and miscellaneous differences

The ratio of males to females among the 585 patients was 2.4 to 1. The mean age of male patients (59.1 years) was significantly lower than that of the female patients (61.4 years) ($p<0.05$). As is obvious from Figure 5, the frequency distribution of the type of aphasia in the males was different from that in the females. The number of patients with irreversible aphasia as well as aphasia with sensorimotor impairment was lower in the males than in the females. A significant difference in mean age between the Broca's aphasics and the Wernicke's aphasics was found in the males (50.2 years vs. 62.2 years, respectively), while this tendency was not evident in the females (57.3 years vs. 59.3 years, respectively).

The number of patients with other communicative disorders, such as a general intellectual deficit, increased with age (Fig. 6).

(2) Recovery process[12,13]

Figure 7 shows the recovery pattern of patients with simple aphasia in terms of comparison between the two age-groups. The abscissa indicates the months post onset, the ordinate shows the overall test score percentage, and each solid line represents one patient, respectively. In the majority of patients of this type, a conspicuous improvement in language function occurred during the first 6 months post onset. Since then, the recovery rate decreased with time, and finally improvement was hardly observed around after one year post onset. The recovery rate appeared to be smaller in the aged group compared to the younger group. Particularly, the aged patients with conduction aphasia, and with aphasia with intermittent auditory imperception made a slow recovery. As for the remaining types, no age difference in the recovery rate was observed, though the recovery pattern differed according to type. Aphasics with persisting dysfluency made the quickest recovery and reached a plateau condition around 6 to 9 months post onset. Aphasics with sensorimotor impairment showed a substantial improvement for a longer period of time (1 to 2 years), although their recovery rate was much smaller. On the other hand, patients with irreversible aphasia (Figure 8), whose performance level on the test was significantly lower than that in any other type both at the beginning and termination of therapy, showed no change in performance level throughout treatment. Among patients with an unclassified type of aphasia, recovery patterns varied from patient to patient.

Generally speaking, there was a tendency for improvement through language therapy to gradually become less remarkable with time except in a small number of cases with considerable individual differences. Figure 9 represents the recovery patterns of 12 patients (the aged group --- 5 cases, the younger group --- 7 cases) who showed improvement even after 2 years post onset. Among these, 2 had continued to receive treatment after two months post onset.

An investigation of the time period of the treatment of the patients was made on 111 patients who reached a plateau of improvement after language therapy. On these 111, patients with irreversible aphasia were not included because none of them showed an improvement. The 111 patients were considered to be the most appropriate for this study because they showed the maximal effect through language therapy using the stimulation method. The period required to reach the plateau condition was relatively shorter in the aged group than in the younger group (6.5 months vs. 7.8 months, respectively: Table 3). With respect to type, the period of treatment in simple aphasia was 3.9 months, which was significantly shorter compared to the following three types: aphasia with sensorimotor impairment (11.6 months, $p<0.001$), aphasia with intermittent auditory imperception (9.4 months, $p<0.001$), and unclassified aphasia (8.8 months, $p<0.05$). An age difference was evident only in aphasia with sensorimotor impairment where the period of treatment was significantly shorter in the aged group than in the younger group (4.7months vs. 14.1 months, respectively) ($p<0.05$).

(3) Prognosis of language deficit[14)]

1) Patients showing improvement

A substantial improvement in language function (defined as an improvement in a patient's overall test scores) was observed in 140 out of the 303 subjects (46.2 %) through language therapy. Figure 10 shows the incidence of improvement in each age-group. As is obvious from this figure, the number of patients showing an improvement decreased with age. Although the incidence of improvement differed neither among the three age-groups below 59 years nor between the two age-groups above 60 years, it was significantly lower in the aged group than that in the younger group ($p<0.001$).

The number of patients showing an improvement also differed significantly depending on the type of aphasia (Figure 11). The highest incidence of improvement after treatment was found in aphasics with persisting dysfluency, while the lowest was found in patients with irreversible aphasia, in which none showed improvement. The rank order of decreasing level of improvement was: (aphasia with persisting dysfluency = conduction aphasia) > (simple aphasia = aphasia with sensorimotor impairment = unclassified) ($p<0.05$) > (irreversible aphasia) ($p<0.001$). (The symbol ">" represents a significant difference).

Figure 12 illustrates the incidence of improvement after treatment for each type of aphasia in terms of a comparison between the aged and the younger group. The number of patients showing an improvement was closely related to age in some aphasic types but not in other types. Aphasia with sensorimotor impairment as well as aphasia with intermittent auditory imperception belonged to the former type, and the number of these patients who showed an improvement was significantly smaller in the aged group than in the younger group.

2) Performance level through language therapy

Figure 13 shows a comparison of the performance level on the test after language therapy between the two age-groups. It should be noted that in the aged group as well as the younger group the number of aphasic patients whose performance level reached a level of functional communicative ability for daily living (more than 80 % of the overall test score) was significantly greater at the termination of treatment (at the top of the figure) than at the beginning of treatment (at the bottom of the figure) ($p<0.001$). The ratio of patients whose performance level reached such a level at the termination of treatment was significantly smaller in the aged group than in the younger group (23.4 % vs. 50.0 %, respectively) ($p<0.001$). On the other hand, the ratio of patients who remained at a level of greatly difficult communicative ability (less than 40 % of the overall test score) in the aged group was more than twice as large as that in the younger group. This difference was also statistically significant ($p<0.001$).

The performance level on the test at the termination of treatment differed according to aphasia type (Figure 14). A significant age difference in the final outcome was seen for simple aphasia, aphasia with intermittent auditory imperception and conduction aphasia. Among patients belonging to these three types, the number of patients whose performance level on the test reached a level of functional communicative ability was significantly smaller in the aged group.

3) Relationship between initial and final performance level on the test

The relationship between the patients' initial and the final performance on the test was examined for the 111 patients who reached a plateau condition, as well as for the patients with irreversible aphasia.

First, the degree of improvement, which was indicated as a gain in the overall test score percentage before and after treatment, was significantly smaller in the aged than in the younger group (20.4 % vs. 25.3 %, respectively) ($p<0.005$).

Figure 15 shows the relationship between type of aphasia and degree of improvement, which ranged from 17.9 % to 27.8 %. A significant difference in the degree of improvement among the types of aphasia was observed only between simple aphasia and aphasia with sensorimotor impairment ($p<0.05$). Incidentally, the degree of improvement in irreversible aphasia was only 5 %, which was markedly low compared with that of the other types. Although there was a tendency for the aged group to show a consistently smaller degree of improvement in all the types of aphasia, no statistical difference was found.

Second, the correlation between the initial and the final performance level on the test was examined (Table 4). As is obvious from the table, higher correlation coefficients were found in aphasia with intermittent auditory imperception ($r=0.83$) and in aphasia with sensorimotor impairment ($r=0.78$). On the other hand, the initial severity of the language deficit was scarcely related to the final outcome in aphasia with persisting dysfluency ($r=-0.03$). The highest correlation coefficient correlation was observed in irreversible aphasia ($r=0.87$). An age difference was noted in aphasia with intermittent auditory imperception and in conduction aphasia, in which the correlation coefficient was greater in the aged group (0.93 and 0.84, respectively).

(4) Prognosis for vocational adjustment[15)]

Table 5 shows the prognosis for social adjustment in the 303 patients. Out of 192 cases who had had paid jobs at their onset of aphasia, 7 were omitted because they could not be contacted. Of the remaining 185, 52 cases (28.1 %) returned to paid jobs excluding house work (return to a previous job -- 29 cases, 15.7%; either transferred to another section within the same

company or changed companies -- 23 cases, 12.4 %). On the other hand, the rest of the 128 cases had no paid job. The social adjustments of these 128 were divided into three groups, namely, transferred to nonresidential sheltered workshops (2 cases, 1.1%), returned home or to institutions for the aged (111 cases, 60.0 %), and transferred to hospitals or rehabilitation settings (15 cases, 8.1 %).

Figure 16 represents the relationship between vocational adjustment and age in 180 aphasic patients after treatment. Twelve out of the 192 having had paid jobs at their onset of aphasia, were excluded because of death or because they could not be contacted after termination of language therapy. As is shown in the figure, it was evident that the ratio of return to paid jobs was closely related to age. That is, the ratio was more than 50 % in the two groups of below 39 years and below 50, whereas the ratio fell to 27 % in the group over 50, and to 10 % in the group over 60, and decreased further with advancing age.

The relationship between vocational adjustment and aphasia type is indicated in Figure 17. The highest ratio of return to paid jobs was 75 % in aphasia with persisting dysfluency, 67 % in conduction aphasia, and 41 % in simple aphasia. In irreversible aphasia no patient returned to a paid job. In addition, the highest ratio of return to previous jobs was 53 % in conduction aphasia and 27 % in simple aphasia. It is worth noting that in aphasia with persisting dysfluency the ratio of return to previous jobs was rather low in contrast to the high ratio of return to paid jobs.

4. Concluding remarks

The present investigation revealed that the symptoms (type and severity), recovery process and prognosis of aphasia differed according to age. Specifically, type and severity of aphasia were closely related to our patients' age. The recovery pattern of the aphasia and the prognosis of the language deficits, as well as vocational adjustment, differed depending on the clinical type of aphasia. Furthermore, a close relationship between age and the recovery pattern or prognosis of the patients was found in some aphasic types but not in other types. Thus, the relationship between the type of aphasia and age was highly complicated.

Our data suggest that not only type of aphasia but also age strongly affects the clinical performance of aphasic patients. The present results shed new light on aphasia diagnosis, prognostic judgments, planning of language therapy and family counselling.

The present results can be explained at least in part by the following: (1) the nature of the CVA resulting in aphasia may have been different in the aged group and the younger group. For example, the incidence of infarcts may have been higher in the former, while that of hemorrhages have been higher in the latter

(Davis & Holland[6], Basso, et al.[9], Kertesz & Sheppard[17]). (2) An increase in age could bring about gradual pathophysiological changes in the brain (Sokoloff[18]). (3) Functional lateralization in the brain representing language may differ according to age (Brown & Jaffe[19]). (4) Aged patients with aphasia may suffer more frequently from perception disorders (Watamori, et al.[20]). Any of these explanations, however, does not seem to completely explain the nature of the age effect, and further studies are necessary.

References

1) Eisenson, J.: Prognostic factors related to language rehabilitation in aphasic patients. J. Speech and Hearing Dis., 14, 262-264, 1949.
2) Marks, M., M. Taylor and H.A. Rusk: Rehabilitation of the aphasic patients; a summary of three years experience in a rehabilitation setting. Arch. Phys. Med. Rehabil., 38, 219-226, 1957.
3) Godfrey, C.M. and E. Douglass: The recovery process in aphasia. Canad. M. A. J., 80, 618-624. 1959.
4) Vignolo, L.A.: Evolution of aphasia and language rehabilitation; a retrospective exploratory study. Cortex, 1, 344-367, 1964.
5) Sarno, M.T.: Language rehabilitation outcome in the elderly aphasic patient (Obler, L.K. and M.L. Albert (eds.): Language and Communication in the Elderly). D.C. Health and Company, Lexington, 1980.
6) Davis, G.A. and A.L. Holland: Age in understanding and treating (Beasley, D.S. and G.A., Davis (eds.): Aging--Communication Processes and Disorders). Grune and Stratton, New York, 1981.
7) Darley, F.L.: Aphasia. W.B. Saunders Company, Philadelphia, 1982.
8) Obler, L.K., M.L. Albert, H. Goodglass and D.F. Benson: Aphasia type and aging. Brain and Language, 6, 318-322, 1978.
9) Basso, A., E. Capitani, M. Laiacona and C. Luzzatti: Factors influencing type and severity of aphasia. Cortex, 16, 631-636, 1980.
10) Harasymiw, S.J. and A. Halper: Sex, age, and aphasia type. Brain and Language, 12, 190-198, 1981.
11) Sasanuma, S., M. Itoh, T.S. Watamori, Y. Fukusako and H. Monoi: Language Therapy for Aphasia. Igaku Shoin Ltd. Tokyo, 1978.
12) Fukusako, Y. and H. Monoi: The influence of age and sex on the type and severity of aphasia. Jpn. J. Logop. Phoniatr., 25, 1-12, 1984a.
13) Fukusako, Y. and H. Monoi: The recovery pattern in treated aphasic patients (1)-- particularly differences depending on the clinical type of aphasia and the age of patients. Jpn. J. Logop. Phoniatr., 25, 295-307,1984b.
14) Fukusako, Y. and H. Monoi: The recovery pattern in treated aphasic patients (2)-- particularly cases in which a plateau of improvement was reached. Jpn. J. Logop. Phoniatr., 25,

308-320, 1984c.
15) Fukusako, Y. and H. Monoi: The prognosis of treated aphasic patients; A comparison aged with younger adult patients. Jpn. J. Logop. Phoniatr., 26, 145-158, 1985.
16) Fukusako, Y. H. Monoi, T. Suzuki and K. Endo: Prognosis of vocational adjustment in treated aphasic patients. Jpn. J. Rehab. Med., 23, 219-227, 1986.
17) Kertesz, A. and A. Spheppard: The epidemiology of aphasic and cognitive impairment in stroke-age, sex, aphasia type and laterality differences. Brain, 104, 117-228, 1981.
18) Sokoloff, L.: Effects of normal aging on cerebral circulation and energy metabolism. (Hoffmeister, F. and C. Muller (eds.): Bayer-Symposium 7: Brain Function in old Age-evaluation of Changes and Disorders). Springer-Verlag, Berlin, 1978.
19) Brown, J.W. and J. Jaffe: Hypothesis on cerebral dominance. Neuropsychologia, 13, 107-111, 1975.
20) Watamori, T.S., Y. Fukusako, H. Monoi and S. Sasanuma: The relationship between the age of onset and nonverbal perception in aphasic patients. Jpn. J. Rehab. Med., 26, 383 -384 1989.

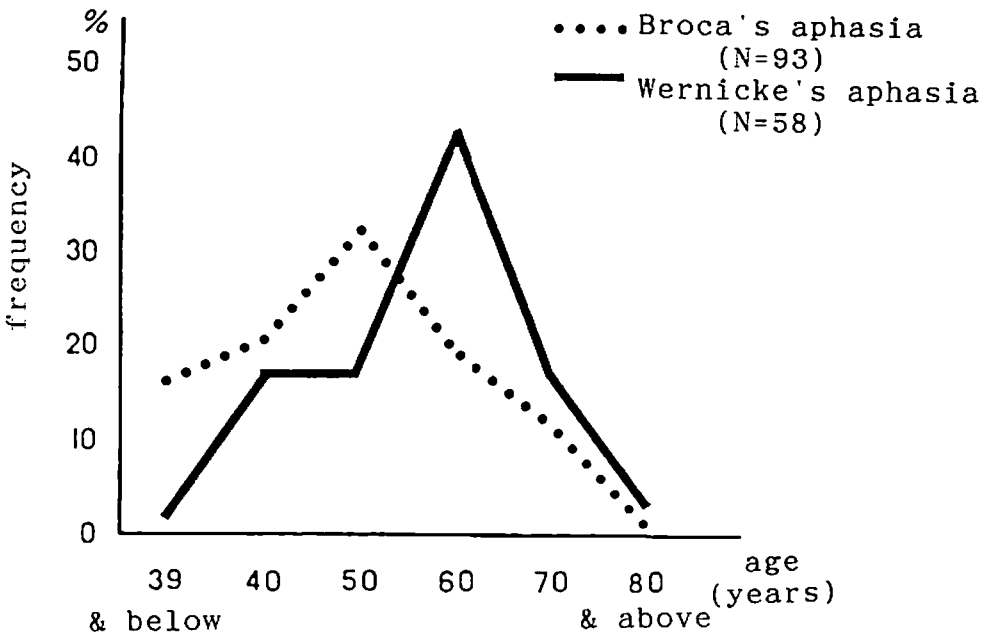


Fig.1 Frequency distribution of type of aphasia in each age-group ---Comparison between Broca's aphasia and Wernicke's aphasia

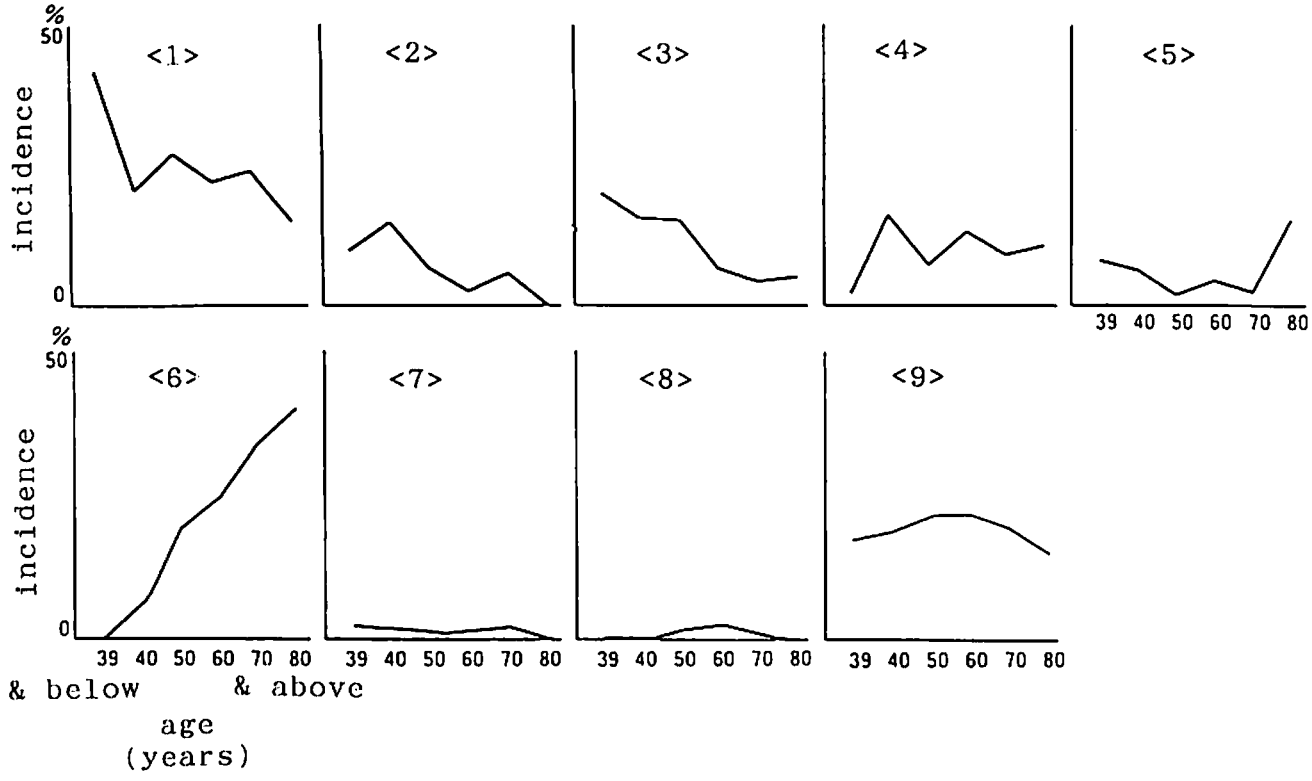


Fig.2 The relationship between incidence of type of aphasia and age

1:Simple aphasia
2:Aphasia with persisting dysfluency
3:Aphasia with sensorimotor impairment
4:Aphasia with intermittent auditory imperception
5:Conduction aphasia
6:Irreversible aphasia
7:Aphasia with visual processes impairment
8:Aphasia with scattered findings
9:Unclassified

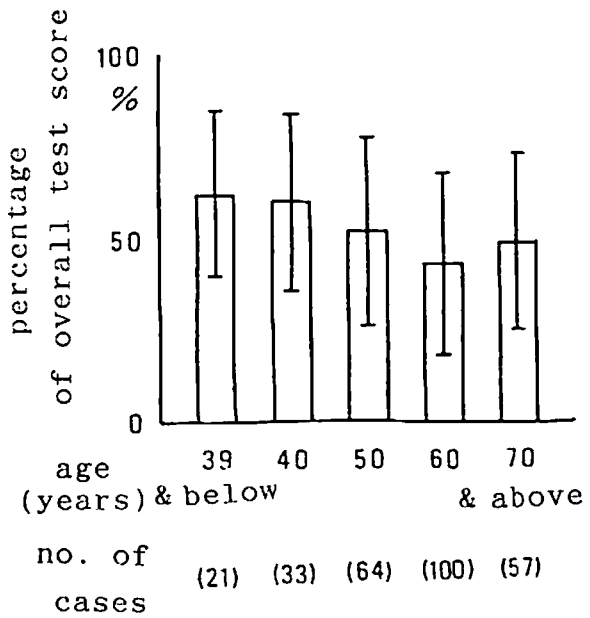


Fig.3 The relationship between the severity of aphasia and age

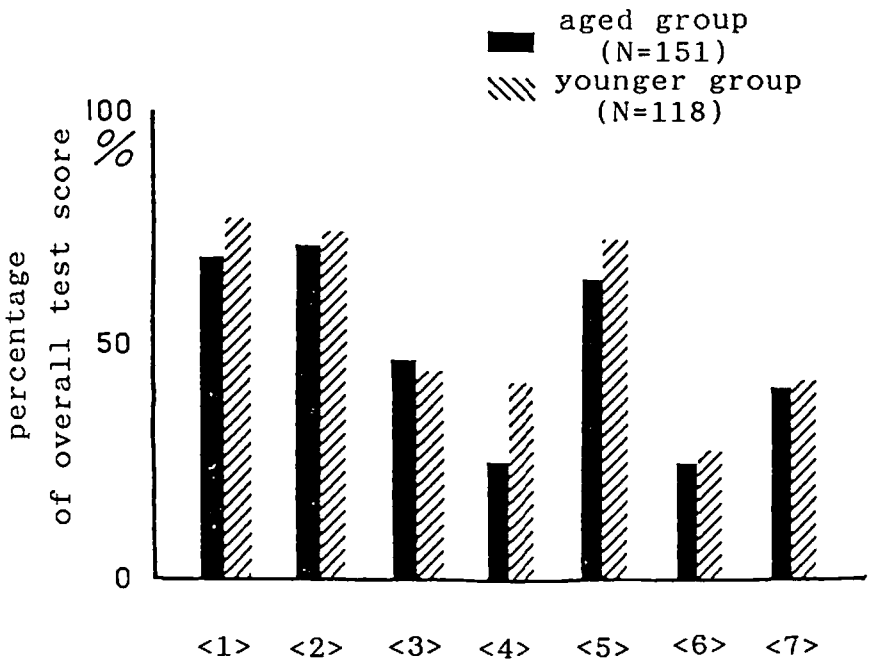


Fig.4 Severity of each type of aphasia
---Comparison between the aged group and the younger group

1:Simple aphasia
2:Aphasia with persisting dysfluency
3:Aphasia with sensorimotor impairment
4:Aphasia with intermittent auditory imperception
5:Conduction aphasia
6:Irreversible aphasia
7:Unclassified

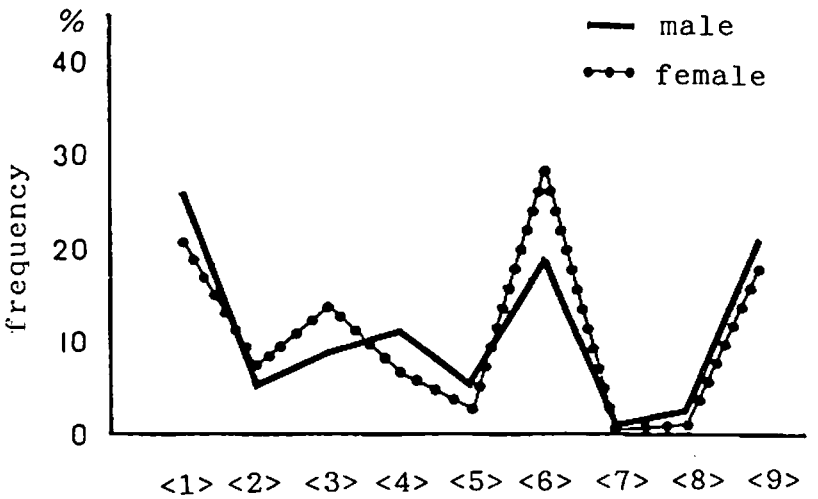


Fig.5 Frequency distribution of type of aphasia in male and female patients

1:Simple aphasia
2:Aphasia with persisting dysfluency
3:Aphasia with sensorimotor impairment
4:Aphasia with intermittent auditory imperception
5:Conduction aphasia
6:Irreversible aphasia
7:Aphasia with visual processes impairment
8:Aphasia with scattered findings
9:Unclassified

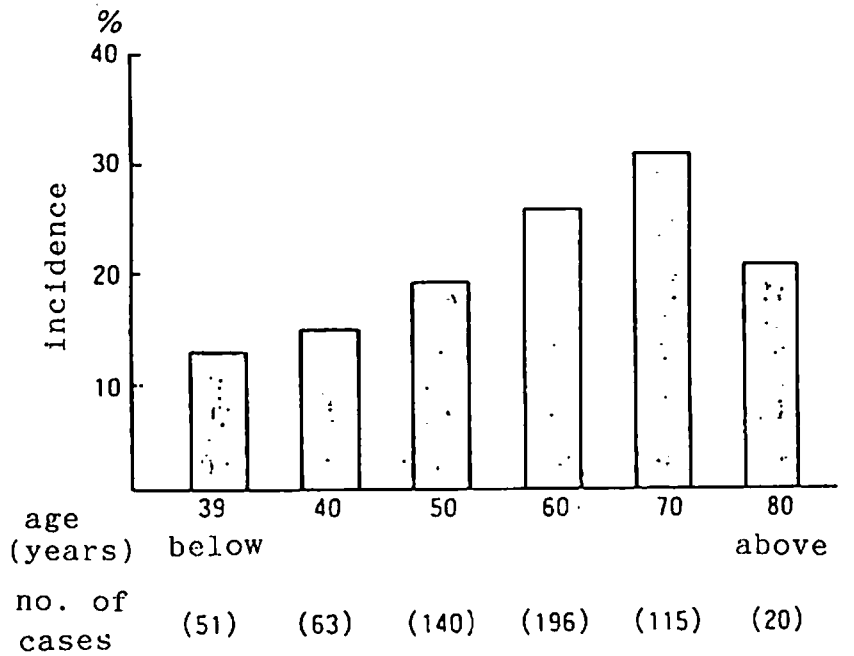


Fig.6 The relationship between the incidence of aphasic patients with a general intellectual deficit and age

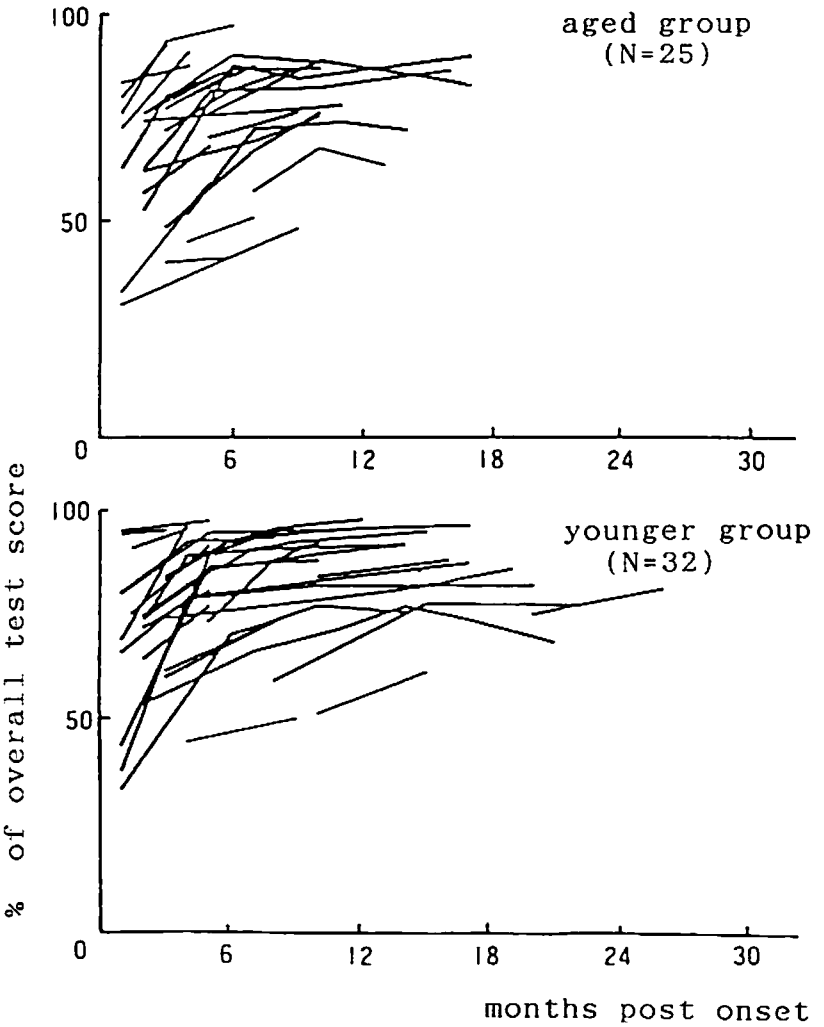


Fig.7 Recovery pattern of patients with simple aphasia

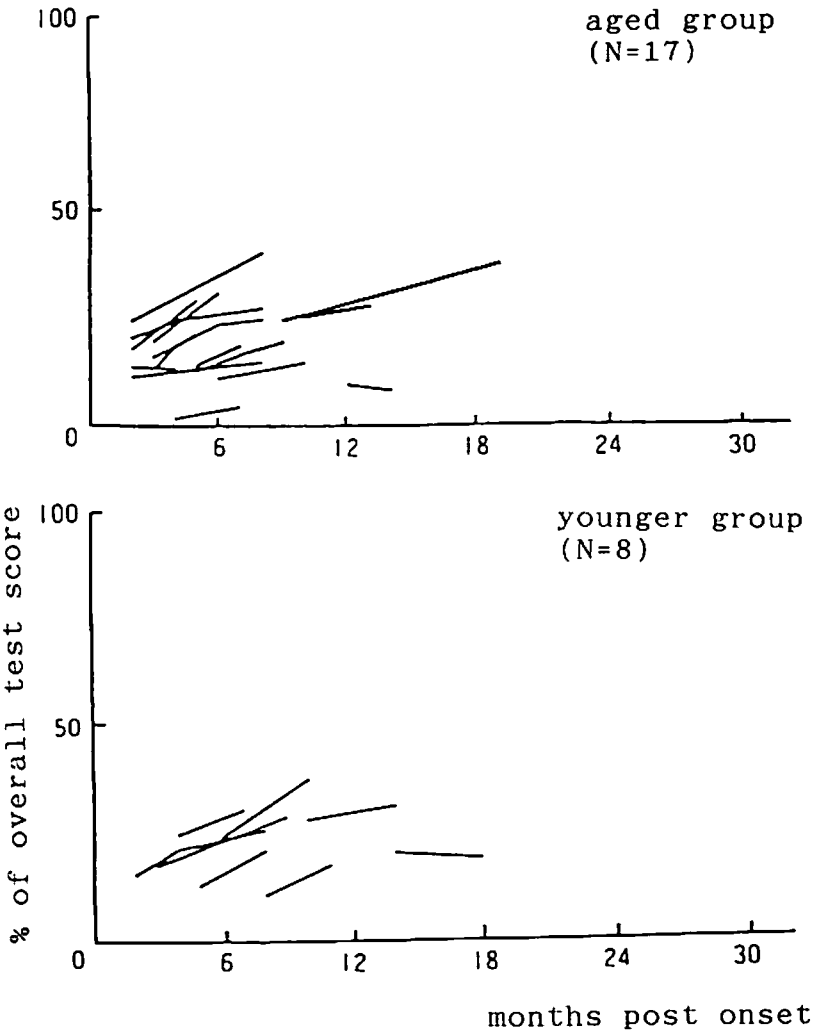


Fig.8 Recovery pattern of patients with irreversible aphasia

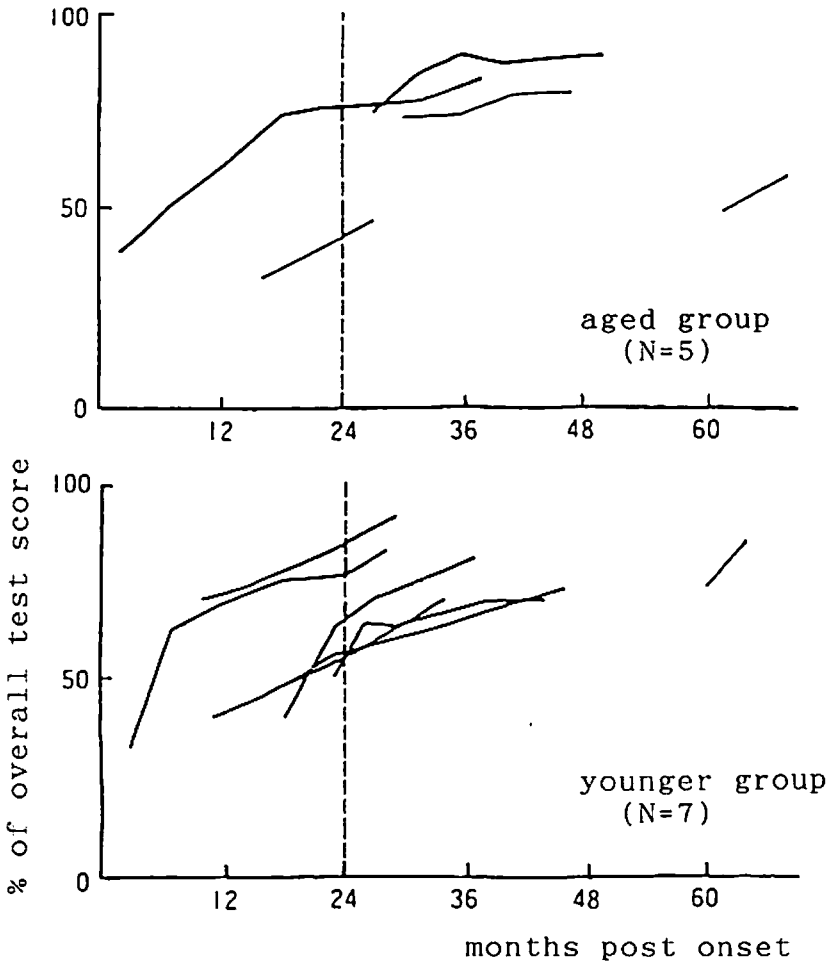


Fig.9 Recovery pattern of patients showing an improvement even two years post onset

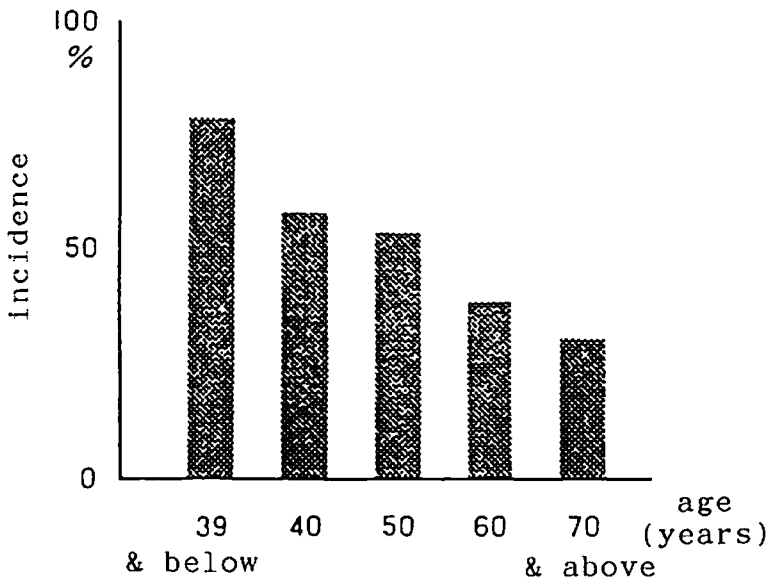


Fig.10 Incidence of improvement* in 303 aphasic patients after treatment in each age-group

*: "Improvement" means a gain in the overall test score above 10 (or 20) % in patients whose overall test score had been more than (or less than) 50 % at the beginning of therapy.

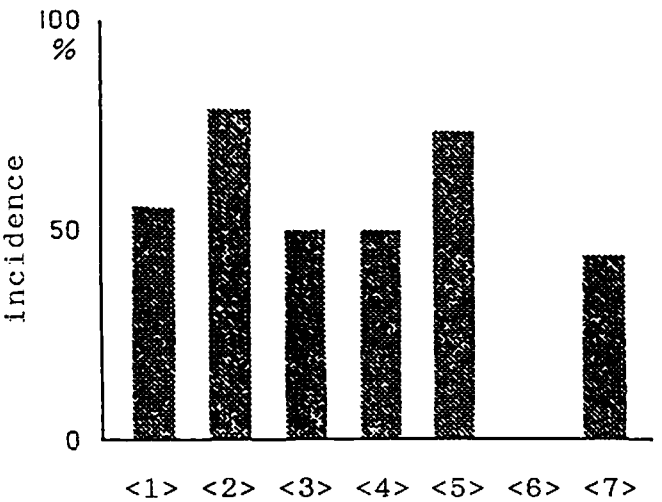


Fig.11 Incidence of improvement after treatment in each type of aphasia

1:Simple aphasia
2:Aphasia with persistent dysfluency
3:Aphasia with sensorimotor impairment
4:Aphasia with intermittent auditory imperception
5:Conduction aphasia
6:Irreversible aphasia
7:Unclassified

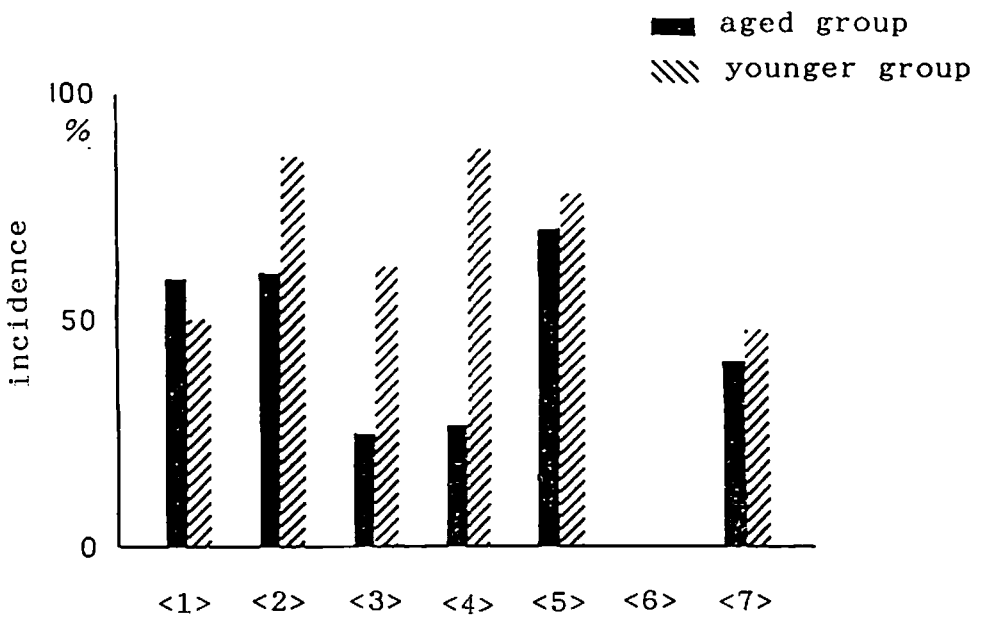


Fig.12 Incidence of improvement after treatment in each type of aphasia ---comparison between the aged group and the younger group

1:Simple aphasia
2:Aphasia with persisting dysfluency
3:Aphasia with sensorimotor impairment
4:Aphasia with intermittent auditory imperception
5:Conduction aphasia
6:Irreversible aphasia
7:Unclassified

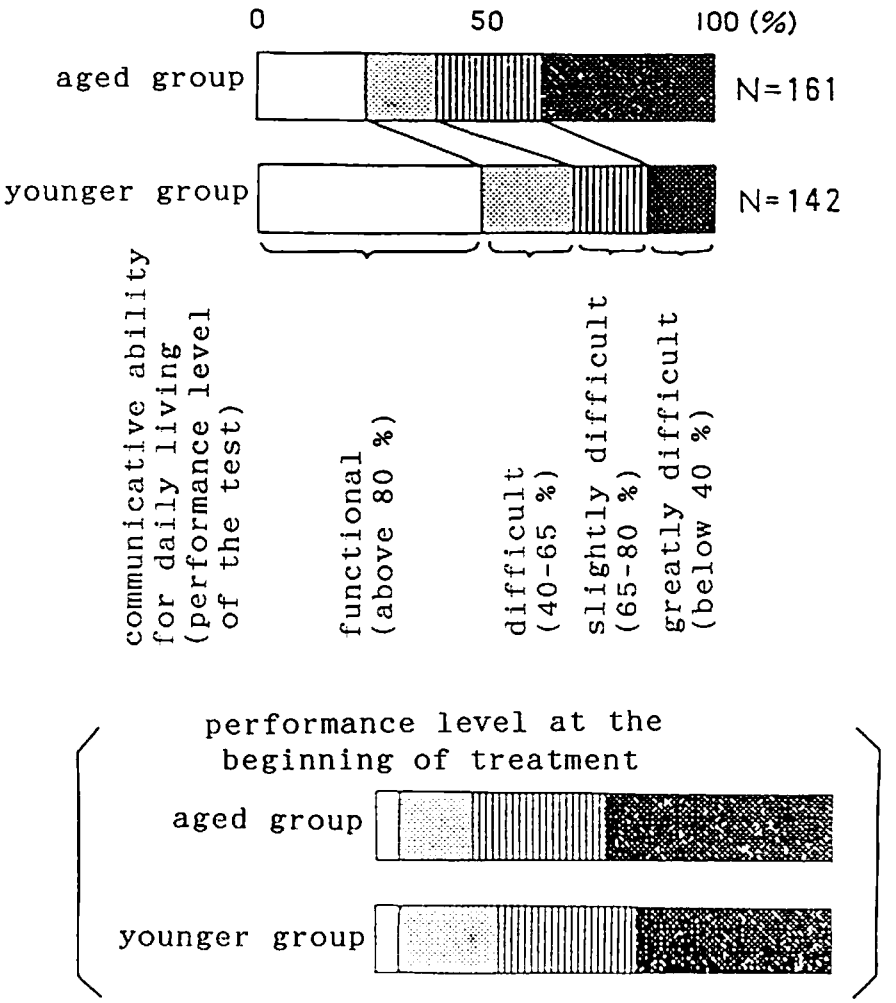


Fig.13 The performance level on the test after treatment---comparison between the aged group and the younger group

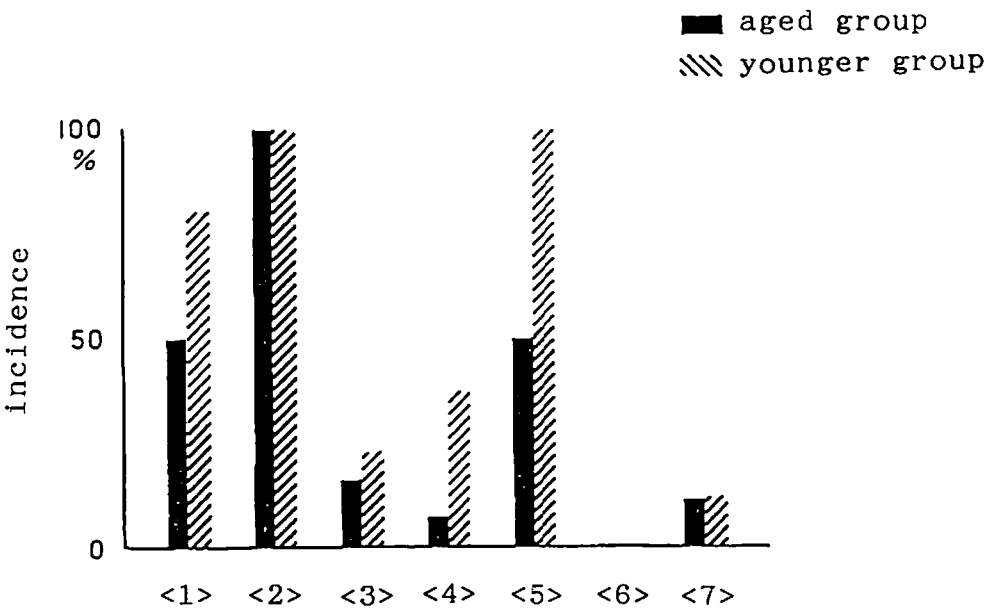


Fig.14 Incidence of patients reaching functional communicative ability for daily living* after treatment in each type of aphasia ---Comparison between the aged group and the younger group

*: "Functional communicative ability for daily living" means a performance level above 80 % for the full score on the test.

1:Simple aphasia
2:Aphasia with persisting dysfluency
3:Aphasia with sensorimotor impairment
4:Aphasia with intermittent auditory imperception
5:Conduction aphasia
6:Irreversible aphasia
7:Unclassified

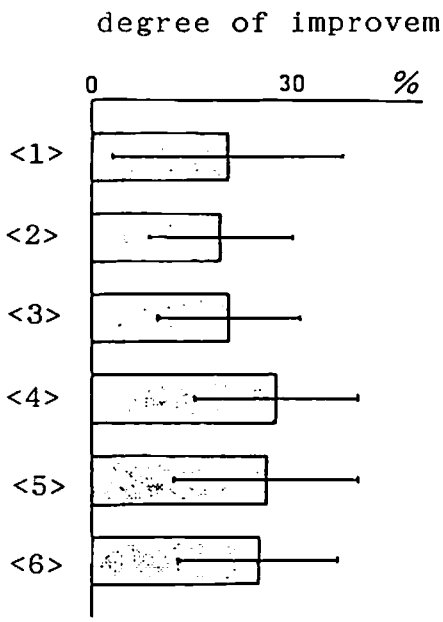
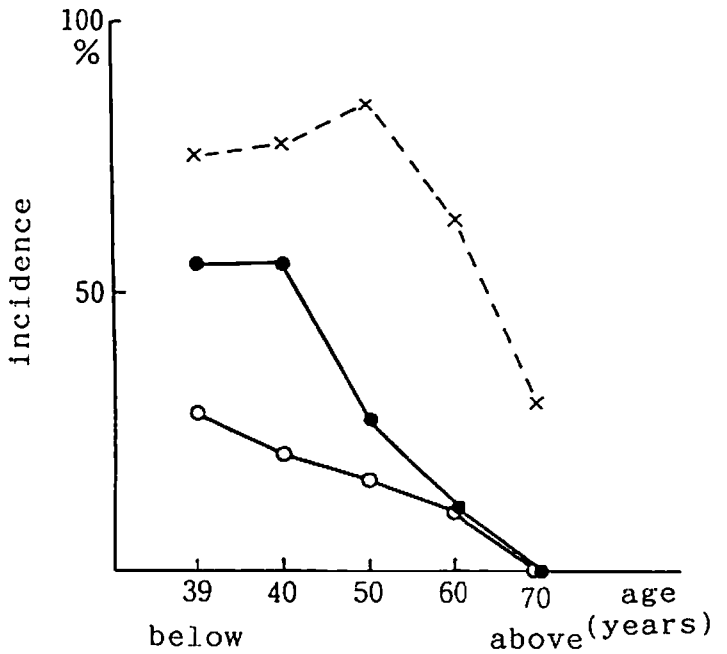


Fig. 15 The relationship between degree of improvement* and type of aphasia

*: "The degree of improvement" means a gain in the overall test score after treatment.

1:Aphasia with persisting dysfluency
2:Simple aphasia
3:Conduction aphasia
4:Aphasia with sensorimotor impairment
5:Unclassified
6:Aphasia with intermittent auditory imperception



no. of cases (24) (45) (72) (102) (60)

×--× incidence of patients having had paid jobs at the onset of aphasia

●—● incidence of return to a previous job after the termination of treatment

o—o incidence of a return to a previous job and transfer to another section, or a change in jobs

Fig.16 The relationship between vocational adjustment and age in 180* aphasic patients having had paid jobs at the onset of aphasia

*: Twelve out of 192 patients were excluded because of death or because they could not be contacted after the termination of treatment.

Fig.17 The relationship between vocational adjustment and type of aphasia in patients having had paid jobs at onset of aphasia

1:Simple aphasia
2:Aphasia with visual processes impairment
3:Aphasia with persisting dysfluency
4:Aphasia with scattered findings
5:Aphasia with sensorimotor impairment
6:Aphasia with intermittent auditory imperception
7:Irreversible aphasia
8:Conduction aphasia
9:Unclassified

Table 1 Subjects

Age	Male	Female	Total
-39years	42	9	51cases
40	39	24	63
50	105	35	140
60	141	55	196
70	73	42	115
80-	12	8	20
Total	412	173	585

Table 2 The mean age in each type aphasia

Type of Aphasia	No. of cases	Mean age	Standard deviation
Simple aphasia (Amnestic aphasia)	144	58.2years	13.2
Aphasia with visual processes impairment	7	60.3	14.4
Aphasia with persisting dysfluency (Broca's aphasia -mild)	34	52.9	15.6
Aphasia with scattered findings	13	63.7	5.8
Aphasia with sensorimotor impairment (Broca's aphasia -moderate to severe)	59	53.1	13.6
Aphasia with intermittent auditory imperception (Wernicke's aphasia)	58	61.6	10.3
Irreversible aphasia (Global aphasia)	126	66.3	8.8
---------- (Conduction aphasia)	26	57.9	15.7
Unclassified	118	59.6	11.9

Table 3 The period of language therapy required to reach a plateau of improvement

Type of Aphasia \ Age group	aged	younger	Whole
			months
Simple aphasia	3.2	4.3	3.9
Aphasia with persisting dysfluency	4.0	6.3	5.8
Aphasia with sensorimotor impairment	4.7*	14.1*	11.6
Aphasia with intermittent auditory imperception	7.8	10.7	9.4
Conduction aphasia	6.0	6.4	6.2
Unclassified	9.2	8.0	8.6
Whole	6.5	7.9	

*: A significant difference was found between the aged and the younger group ($p<0.05$).

Table 4 Correlation coefficient between the initial and the final performance level on the test

Type of Aphasia \ Age group	aged	younger	Whole
Simple aphasia	0.66	0.66	0.63
Aphasia with persisting dysfluency	-*	-0.25	-0.03
Aphasia with sensorimotor impairment	-*	0.85	0.78
Aphasia with intermittent auditory imperception	0.93	0.66	0.83
Conduction aphasia	0.84	-0.11	0.41
Unclassified	0.48	0.67	0.59
Irreversible aphasia	0.90	0.74	0.87

*: Correlation coefficient was not calculated because of the small number of cases

Table 5 Social adjustment in 303 aphasic patients

	Presence or absence of job* at the onset of aphasia			
	paid job	no job	unknown	total
				cases
return to the previous job	29 (15.7%)**	0	-	29 (10.1%)
transferred to another section or changing the job	23 (12.4%)	0	-	23 (8.0%)
transferred to nonresidential sheltered workshop	2 (1.1%)	0	-	2 (0.7%)
return to home or institution for the aged	111 (60.0%)	95 (93.1%)	-	206 (71.8%)
transferred to hospital or rehabilitation setting	15 (8.1%)	4 (3.9%)	-	19 (6.6%)
dead	5 (2.7%)	3 (2.9%)	-	8 (2.8%)
unknown	7	0	9	16
total	192	102	9	303

*: Excluding house work.
**: The ratio of the patients in each group was calculated excluding the unknown cases.