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A Note on the Disposition of Brain-damaged Inpatients with Mental Deterioration

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ABSTRACT. We have made a survey of the dispositions of brain-damaged patients with mental deterioration admitted to the Department of Rehabilitation Medicine of Kawasaki Medical School Hospital between October, 1983 and September, 1985.

A multivariate statistical analysis was done to discover some determinant factors for the length of the hospital stay of the patients and their destinations after leaving the hospital.

Key words : Rehabilitation — Brain-damaged — Disposition

After every means of medical treatment has been employed to help a patient, his or her main goal is to regain the ability to lead a normal daily life through rehabilitation and, of course, to return home. Frequently, however, such a goal is difficult to achieve, especially if the patient suffers mental disturbance.

We know from experience that the destination of a brain-damaged patient after leaving the hospital is almost always determined by residual ability and home conditions for receiving him or her. In this short report, we discussed the hospital stays and dispositions of brain-damaged patients in relation to their final physical state and family composition.

MATERIALS AND METHODS

We have reviewed admission histories and chosen 27 cases of brain disease associated with mental problems admitted to the Department of Rehabilitation Medicine of Kawasaki Medical School Hospital between October, 1983 and September, 1985. This group is composed of fifteen lt. hemiplegics, six multiple cerebral infarctions, three rt. hemipareses without aphasia, and three traumatic brain injuries.

These subjects include sixteen cases that presented with clinically overt spatial agnosia and six cases that presented with night delirium. Cases which presented with Parkinson's syndrome, aphasia, hydrocephalus, or serious visceral complications were excluded.

The age, sex, family composition, duration of suffering, and score on Hasegawa's mental scale for each case were taken from the admission charts.

The final functional levels of four self-care items were respectively rated in three ranks from the evaluation charts of nurses (See Table 1 for the criteria).

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TABLE 1. Criteria for rating of functional abilities.

	Totally dependent	Partially dependent	Independent
Mobility	Need assist for transfer (W/C⇄Bed)	Need assist or close supervision for ambulation	Independent walking (in a room)
Dressing	Impossible	Dressing change partially possible	Functionally independent
Feeding	All assisted	Partially assisted or need supervision	Always by oneself
Excretion	Incontinence, Need diaper or collecting device	Need assist to use lavatory	Independent

RESULTS

The subjects were divided into the following two groups.
Group 1 (16 cases) : Discharged to home.
Group 2 (11 cases) : Discharged to another institution.

The average age was somewhat older and the average length of hospital stay was shorter in group 1 than in group 2 (Tables 2, 3). To discover some effective factors for discriminating between the two groups, a multivariate statistical analysis was done using Hayashi's second method of quantification (Table 4).

TABLE 2. Average age of the subjects.

	Average age (years old)	S.D.
All subjects	61.7	8.9
Group 1	65.4	6.7
Group 2	56.4	9.1

TABLE 3. Average length of hospital stay.

	Average stay (days)	S.D.
All subjects	139.5	85.9
Group 1	106.9	47.5
Group 2	187.0	105.0

Following comparison of the ranges of the weights of categories within the items, it is suggested that the destination of each patients is under the considerable influence of sex, final mobility, and number of family members.

As can be seen in Table 5, the percentage of patients who could not return home was larger among men than among women. This tendency was the same regardless of whether the spouse was alive or not (Table 6).

Figure 1 illustrates the relation between the number of family members (other than the spouse) and the percentage of patients who returned home.

TABLE 4. Results of analysis : the influence of each item on disposition.

Items		Weight of each category		Range
1	Age	~ 59 60 ~	−0.0359 −0.0211	0.0570
2	Sex	male female	−0.01477 0.2954	0.4431
3	Spouse	+ −	0.0382 −0.1680	0.2068
4	Hasegawa's score	0 ~ 10 10.5 ~ 21.5 22 ~ 29.5	0.0897 0.1929 −0.2149	0.4078
5	Mobility	total partial independent	−0.3513 0.2505 −0.0122	0.6018
6	Dressing	total partial independent	0.0313 −0.1116 0.0562	0.43482
7	Feeding	total partial independent	0.4104 −0.1538 0.0022	0.5642
8	Excretion	total partial independent	−0.1870 0.0648 0.0203	0.2538
9	Duration of suffering	0 ~ 3 M 3 M ~ 1 Y 1 Y ~	−0.0432 0.0327 0.0381	0.0813
10	Number of family other than the spouse	0 1 2 3 4 5 6	−0.4241 −0.0308 0.0407 −0.0756 0.0087 −0.0139 0.03317	0.7558

Discrimination ratio : $26/27 \times 100 = 96.3$ (%)
Correlation ratio : $\eta^2 = 0.8855$
Total : represents totally dependent
Partial : represents partially dependent

TABLE 5. Number of cases of each sex.

	Male	Female
Group 1 : To home	8	8
Group 2 : To another institution	9	2

In the results of the analysis, the ranges of weights in Hasegawa's score, dressing and feeding also showed significantly large values, but the weights of each category were not arranged in order in each item. Therefore such items can hardly be regarded as good factors for the prediction of dispositon.

In the next place, to estimate the length of hospital stay, from the rated

TABLE 6. Number of caces : Marital status and disposition.

	Spouse alive		Single	
	Male	Female	Male	Female
Group 1 : To home	9	5	0	2
Group 2 : To another institution	6	2	2	1

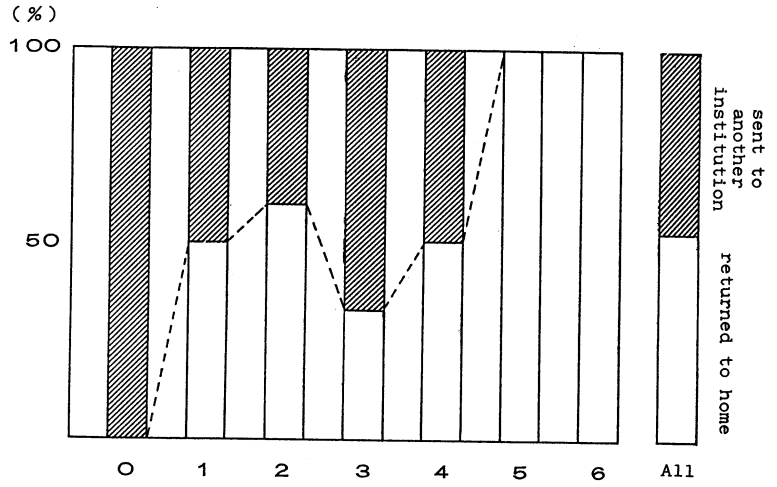

Fig. 1. Relation between number of family (other than the spouse) and the levels of self-care ability.

factors, a multivariate analysis was carried out using Hayashi's second method of quantification (Table 7). After comparison of the partial correlation coefficients of the items, it is suggested that the functional levels of mobility, feeding, and Hasegawa's mental score have considerable influence on determining the length of stay.

Here again, the weights of each category of Dressing and feeding showed a divergent pattern.

It seems peculiar to us that the persons most disabled in regard to dressing and feeding are apt to be discharged a bit earlier.

For reference, the rated functional levels are presented separately based on each rank of mentality in Figure 2.

DISCUSSION

In these analyses, a strongly definitive factor was not found, but the final function levels (especially mobile independence) and number of family members were revealed to be suggestive factors for prediction of the destination of the patient after leaving the hospital, and the degree of mental disturbance was a suggestive factor for the length of stay as well as functional abilities. Before interpretation of these observations, however, it should be emphasized that the

TABLE 7. Results of analysis : the influence of each item on the length of hospital stay.

Items		Weight of each category		Partial correlation coefficient
1	Age	~ 59 60 ~	0.37 −0.22	0.005
2	Sex	Male Female	−2.68 5.35	0.079
3	Spouse	+ −	4.84 −21.31	0.200
4	Hasegawa's score	0 ~ 10 10.5 ~ 21.5 22 ~ 29.5	108.15 −191.36 87.74	0.725
5	Mobility	total partial independent	179.35 −8.77 −83.10	0.837
6	Dressing	total partial independent	−279.01 47.60 50.25	0.606
7	Feeding	total partial independent	−253.96 283.50 −25.94	0.809
8	Excretion	total partial independent	52.42 −14.22 −9.61	0.227
9	Suffering duration	0 ~ 3 M 3 M ~ 1 Y 1 Y ~	16.47 −5.50 −28.52	0.342
10	Number of family other than the spouse	0 1 2 3 4 5 6	261.60 210.08 −64.06 −49.31 −104.94 −140.04 −84.04	0.755

Multiple correlation coefficient : $R = 0.8855$
Coefficient of determination : $R^2 \times 100 = 78.4$ (%)
Total : represents totally dependent
Partial : represents partially dependent

Department of Rehabilitation Medicine of Kawasaki Medical School Hospital is a central institution for aggressive rehabilitation service and many of its inpatients are sent from emergency wards.

This may be the reason for the shorter average duration of suffering before entrance and the younger average age of the subjects as apposed to the figures for patients in hospitals for the senile and stroke clinics.

Although the items of dressing, feeding and Hasegawa's mental score were thought to be significant factors, the sequentially rated categories for these factors did not exhibit sequentially proportional weights on disposition and hospital stay. The explanation for such a finding may be as follows. Feeding and dressing are the most fundamental self-care functions and patients who are totally dependent even in feeding or dressing are regarded as the most disabled

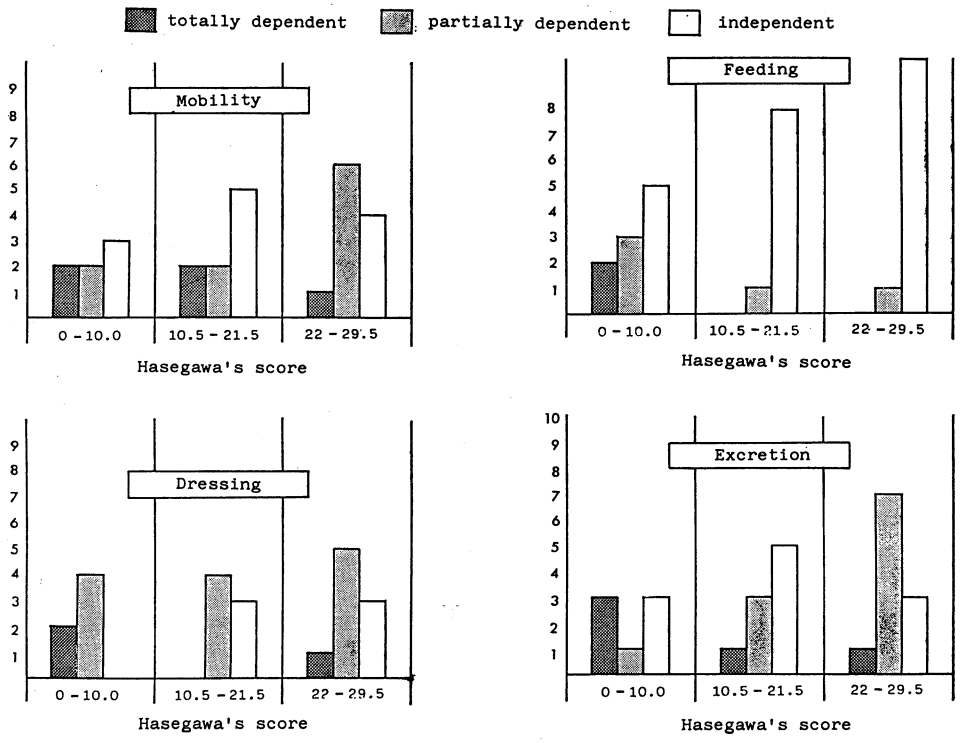

Fig. 2. Histograms of ranked Hasegawa's score in relation to the levels of self-care ability.

patients. In addition, such patients frequently experience severe mental disturbance. Therefore, very low goal levels are usually set for them, and they are frequently discharged a bit earlier than partially dependent patients.

As for the composition of a family, we think what is important is who is at home during the daytime, not the mere number of family members.

In this report, we have discussed, so to speak, some clear cut rating factors. But some other factors (psychological aspects, financial condition, etc.) may require analysis.

In any case, comprehensive consideration of the factors which may influence the final disposition of a brain-damaged patient is necessary in order to carry out rehabilitation efficiently and to avoid longer hospital stays than required.

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