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Changes in Cognitive Functioning in Elderly Psychiatric Patients

By ANTONIA WHITEHEAD

Summary. Elderly psychiatric patients who were in contact with the hospital one year after in-patient admission were retested on a number of clinical and psychometric measures first done soon after admission. In general, changes were small; and for several measures very high correlations existed between the scores gained on the two occasions. When those patients with uncomplicated chronic brain syndromes were considered separately, increasing impairment was demonstrable.

Introduction

Individual decisions are frequently made on the basis of changes in psychometric characteristics. Yet little is known about the magnitude of changes to be expected to occur over time in elderly psychiatric patients. Repeated testing with subtests of the WAIS over a six-year period (Savage, Britton, Bolton and Hall, 1973) has shown that elderly community residents tend to obtain decreasing verbal and increasing performance scale scores. Patients in hospital with affective psychoses differ from the normals in having no tendency towards decreased verbal scores, and schizophrenics in failing to increase their performance scores.

The purpose of the present study was to look at the changes occurring in elderly patients during the year following their admission; clinical and psychometric assessments made shortly after admission were repeated after one year for those patients who attended the hospital as either in- or day-patients. While the use of such a restricted sample precludes generalization of the results to the entire admission cohort, it is justifiable in practical terms since it is about such patients that decisions based on intellectual changes have to be made.

Method

Subjects

The original pool of 200 patients were those included in the study reported by Whitehead (1976) and were a consecutive series of in-patient admissions over the age of 60 years. At the end of one year 64 of these patients were found to be attending one of the admitting hospitals as either in- or day-patients. Of these, 45 were women, and the mean age on admission was 70 years.

Procedure

Patients were approached two to five days after admission and again after twelve months. Those willing, having adequate speech and not undergoing ECT were tested, and following this the psychiatrist's and nurse's ratings were obtained. Full details of all the measures are given in the Appendix.

Results

Main analysis

Psychometric data were obtainable on both occasions of testing for 44 of the 64 patients. The mean scores on admission are shown in the second column of Table I; these are, in general, at a lower level than those for the whole admission cohort, confirming this to be a somewhat impaired subsample. The mean changes over the year can be seen in the next column; it will be noted that these tend to be minimal. Related t-tests (using two-tailed estimates of significance levels) indicate that for only four variables—social functioning, co-operativeness,

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task orientation and fluency—were the changes significant, and all these were in the direction of improved functioning.

In the fourth column of Table I may be seen the correlations between the scores on the two occasions of testing; with a strong expectation of positive correlations, one-tailed tests of significance were made. Most of these correlations are significant, and several are of sufficient magnitude to suggest that they would be of use in the assessment of the individual case, by enabling the prediction of an expected score for comparison with that actually obtained. For this purpose, regression equations were calculated for those variables where the correlation was in excess of 0·7; and the additional information required to estimate a predicted score and the deviation from it of an obtained score (see Payne and Jones, 1957) is given in Table II.

Patients with chronic brain syndrome

Within this mixed group of patients were a number with a diagnosis of chronic brain syndrome, for whom there must be a definite expectancy of declining levels of function. To look at this, patients were selected with this as a definite diagnosis at one year and who were not thought on either occasion of testing to have any additional process (e.g. acute brain syndrome) that might affect the scores. Twenty-two patients fulfilled these criteria, of whom 15 had psychometric results. The mean changes in scores for this group are given in Table I, together with significance levels (using one-tailed tests). It will be seen that for these the tendency is indeed towards increased impairment, and that for several of the variables the decline in scores attains a significant level. This contrasts with the change in performance of the remaining patients, which tends towards improvement; and the significance of the difference between the two subsamples indicates that for the majority of measures the chronic brain syndrome patients were running a deteriorating course compared with that of the remainder of the sample.

Discussion

For the entire sample of patients in contact with the hospital one year after the index

Table I

Mean score on admission, changes at 12-months and test-retest correlations

	Whole group				Chronic brain syndrome	Remaining patients	Comparison of subgroups
	N	Admission score	Change	Test-retest correlation	Change	Change	
Intellectual impairment†	64	1·5	+0·1	·72***	+0·4*	−0·1	*
Mobility†	64	1·6	0	·19	+0·4*	−0·3*	**
Feeding†	64	1·6	+0·1	·24*	+0·2	+0·1	
Dress†	64	2·5	−0·1	·46***	+0·5	−0·4	*
Toilet†	64	1·6	+0·1	·49***	+0·6*	0	*
Social†	64	3·5	−0·5***	·36**	−0·2	−0·6***	
Co-operativeness†	49	2·5	−0·5**	·18	−0·2	−0·7**	
Task orientation	44	2·5	+0·2*	·52***	+0·1	+0·2**	
WAIS Vocabulary	43	8·2	−0·1	·72***	−1·9*	+0·9*	**
Digits forwards	44	5·0	−0·4	·54***	−1·7**	+0·3	***
General orientation	43	4·4	0	·82***	−0·9**	+0·5	*
General events	43	2·7	0	·84***	−0·8**	+0·3	*
Inglis Mediate	42	16·0	+2·5	·72***	−2·1	+5·1**	**
Total learning score	41	47·6	+2·6	·69***	−13·9**	+12·1**	***
Fluency	41	7·0	+1·9*	·52***	−1·5	+3·9***	***
Parietal scale	43	4·3	−0·2	·70***	−1·1*	+0·3	**

Where N < 44, this reflects occasional refusals by patients.
† High scores indicate impairment.
*, **, *** P < ·05, ·01, ·001.

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TABLE II

*Data for prediction of 12-month score from that on admission**

	a	*b*	*r*	SD_y
Intellectual impairment ..	0·380	·797	·716	1·139
WAIS Vocabulary	1·956	·742	·724	4·414
General orientation	0·293	·931	·821	3·246
General events ..	0·061	·984	·845	2·759
Inglis Mediate ..	7·376	·743	·725	12·434
Parietal scale ..	0·333	·891	·703	2·068

* This may be calculated from the following equation (x is the score on admission and y that at one year):

$$\text{predicted score} = \hat{y} = a + bx$$

and to test the significance of the difference between predicted and obtained score:

$$z = \frac{y - \hat{y}}{SD_y \sqrt{1 - r^2}}$$

admission, scores tended to remain fairly stable. For some measures, significant improvements were demonstrable, and these seemed to be on measures which in part reflected the patient's ability to respond appropriately in a social situation. For many of the measures there were substantial correlations between scores on the two occasions of testing. Those for the ratings of self-care skills tended to be rather lower than the others; but it is not known whether this reflects less stability of functioning or merely lower test reliabilities.

Of more theoretical interest was the finding that a subsample of patients could be selected for whom expected declining levels of functioning were demonstrable. Significant decrements were shown not only for the types of material known to be affected by dementing processes and used therefore as diagnostic aids, such as the verbal learning tasks, but also for those considered relatively resistant to change, such as WAIS Vocabulary and digits forwards. As noted in the Introduction, these findings are of restricted generality, since they refer to patients maintaining contact with the hospital who may well be those making relatively poor progress. To assess the extent of the likely bias, records of the remaining patients were scanned; from available data a further 27 patients of the original cohort might have been comparable with the 22 available patients; 9 of these had been discharged from hospital care and the remaining 18 had died. So the results have to be viewed in the context that of the patients surviving for one year three-quarters were reassessed, but that these would be likely to over-represent patients making relatively poor progress.

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APPENDIX

The measures

(a) *Psychiatrist's estimate* of intellectual impairment (4-point scale running from 0 = nil to 3 = severe).

(b) *Nurse's rating* of self-care ability in the areas of mobility, feeding, dress, toilet and social functioning (each had five defined points, e.g. *feeding* 1 = looks after self satisfactorily to 5 = fully spoon fed).

(c) *Response to testing:* (i) co-operation (Huston and Senf, 1952; five defined points running from 1 = active interest and enthusiasm for tests; very good and consistent effort, to 5 = absolutely refuses to co-operate; no results). (ii) task orientation (from 0 = nil, to 3 = full).

(d) *Psychometric tasks:* (i) WAIS Vocabulary (age-corrected score); (ii) digits forwards; (iii) General orientation (adapted from Post, 1965; those failing to score were asked their name and those unable to supply it gained a score of −1); (iv) General events (from Post, 1965; item about recent strike excluded, giving a maximum score of

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10); (v) Short forms of Inglis learning tests (Whitehead, 1973; all subjects were tested on the Mediate pairs and those failing to achieve a criterion of three successive correct responses for at least one pair went on to attempt the Easy pairs, and the total learning score was the sum from these two tests. Those attained criterion went on the Inglis Hard pairs and were credited with a full score for the Easy pairs); (vi) Fluency (Whitehead, 1971; the number of animal names produced in one minute); (vii) Parietal Scale (McDonald, 1969).

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