

## PROGNOSIS OF DEPRESSION

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### SUMMARY

Relationship of different symptoms, personal history, some measures of Rorschach, neuroticism, ego strength score with prognosis of depression was studied. Out of 60 items studied in 60 cases, eleven were found to have statistically significant association with improvement. Multiple regression of percentage of improvement on 25 items (12 from personal and family history and 13 measurable items of Rorschach) was determined. To check the ability of this multiple regression to explain differences in responsiveness, predicted values were obtained for 24 cases (not included in the previous regression analysis). In most cases considerable differences were found in observed and predicted values. Then a regression coefficient using only 12 items (other than 13 Rorschach items) was determined similarly. Using this regression equation, predicted values for percentage of improvement were obtained for the same 24 cases. There was insignificant association between observed and predicted values. Thereafter only five measurable characteristics strongly related with percentage of improvement were taken and multiple regression on these items was determined and checked similarly on the same 24 cases. This also showed insignificant association between observed and predicted values. Linear regression is unable to explain the difference in prognosis of population very similar to one on which it was developed. Inclusion of more history and social interaction factors might lead to more fruitful results.

During the last few decades studies have been conducted to assess the prognosis of depressive illness (Abraham *et al.*, 1963; Kay *et al.*, 1969; Kiloh and Ball, 1961 and Kendell and Gourlay, 1970). Because of a discrepancy in diagnostic types such prognostic studies have not yielded worthwhile results. We have tried to study the outcome of depressive illness in terms of present symptoms and personality of the individual. No attempt was made to determine any relation between type of depression and results of drug treatment.

### METHODS AND MATERIAL

The patients included in the study were out-patients attending a private psychiatric clinic. All the patients received imipramine 100 mg in two equally divided doses for six weeks (except for the first two days when they received 50 mg in two divided doses).

All the consecutive patients suffering from depressive illness were included in the study. Schizoaffective patients and patients with severe anxiety than depression were excluded. Patients with associated organic syndrome or who were receiving antidepressants during last three months were also excluded. Patients whose illness was so severe that immediate E. C. T. was indicated, were not included in the study.

Every probable case of depression was examined by two psychiatrists independently and only when a complete agreement existed between the two, was the case included. No attempt was made to divide these patients further into different types of depression. The following tests were applied to the cases so diagnosed:

- 1) Adapted version of Beck's Inventory for measuring depth of depression (Ajmany and Nandi, 1973).

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- 2) Adapted version of Barron's Ego Strength Scale (Sachdev and Nandi, submitted for publication).
- 3) Kundu's Neurotic Personality Inventory (Kundu, 1963; 1966).
- 4) Rorschach Ink Blot Test.

In addition, a thorough psychiatric examination was conducted in each case and the results recorded in case record schedules specially designed for the purpose.

The adapted version of Beck's Inventory was readministered to each patient after 3 weeks and 6 weeks of drug therapy. Reduction in score on the Inventory was taken as the criterion of improvement.

#### RESULTS AND DISCUSSION

Out of 60 cases reported, 21 males and 15 females belonged to the age group 20-39 years while 18 males and 6 females were in the age group 40 yrs. and above. In all 45 were married, 14 unmarried and 1 widow.

To find the relationship of different symptomatic, demographic and personality factors with the extent of improvement, correlation and  $X^2$  (chi-square) measures of association were calculated, depending on whether a factor was quantitative (variable) or qualitative (attribute). The usual t-test for significance of correlation was carried out. Out of the 60 variables studied, 11 were found to have significant association/correlation with extent of improvement. These are—

- 1) Age of onset of present illness,
- 2) Age of onset of illness,
- 3) Presence of history over one year with no symptom free period,
- 4) Onset (Gradual),
- 5) Sleep disturbances,
- 6) Adequate premorbid personality,
- 7) Absence of adequate psychogenesis,
- 8) Low first day score on Beck's Inventory,

- 9) Low score on KNPI (Kundu's Neurotic Personality Inventory).
- 10) Absence of agitation
- 11) High W% (Whole responses).

Once some of the factors or traits were identified to have significant association or correlation with prognosis, a multiple linear regression of prognosis on such factors was determined by the usual method of least squares using standard programme on a computer (IBM 1130).

Twelve items including symptoms and demographic data of depressives and all thirteen measurable items of Rorschach were taken for calculation of multiple regression. These twelve items are :

- 1) Type of onset,
- 2) Duration,
- 3) Age at time of present onset,
- 4) Age at time of first onset,
- 5) History over one year with no symptom-free period,
- 6) Adequate premorbid personality,
- 7) Agitation,
- 8) Adequate psychogenesis,
- 9) Hypochondriasis,
- 10) 1st day's score on Beck's Inventory,
- 11) Score on Kundu's Neurotic Personality Inventory,
- 12) Score on Barron's Ego Strength Scale.

All the above items have statistically significant association with the prognosis (except duration, hypochondriasis and ego strength). Sleep disturbances which also had statistically significant association have not been included for regression analysis because information on this item cannot be converted into the required numerical form. Duration with product moment correlation of  $-0.199$ , hypochondriasis with point biserial correlation of  $+0.21$  and ego-strength with product moment correlation of  $+0.24$  were included in the analysis, because their association is high (though not statistically significant; correlation of  $+0.25$  is statis-

tically significant here) and other studies also have found them to be of value in predicting response.

Regression co-efficients for different factors taken as independent explaining variables were determined. The usual t-test for significance of partial regression co-efficient was applied. Out of 25 items studied, significant dependencies were found on 14 items. To check the ability of this multiple linear regression to explain differences in responsiveness, predicted values were obtained for 24 cases (not included in previous calculations) whose age, sex and marital status is presented in Table 1. In most of the cases, there was

TABLE 1. *Showing Age, Sex and Marital Status of the cases not included in multiple regression analysis*

Age (Years)	Sex		Marital Status	
	Male	Female	Married	Single
20-39 (N=14)	8	6	9	5
40-59 (N=10)	5	5	10	0
Total (N=24)	13	11	19	

considerable difference in observed and predicted values. To test the agreement

TABLE 2. *Showing differences in observed and predicted percentage of improvement (prediction based on regression co-efficient of 25 factors)*

		Predicted percentage of improvement		
		Above the median	Below the median	Total
Observed percentage of Improvement	Above the median	6	6	12
	Below the median	6	6	12
	Total	12	12	24

between observed and predicted values, a two way table (Table II) classifying the cases as having prognosis value above and below the median for observed and expected values was prepared. This table (No. I) shows insignificant association between observed and predicted values.

Thus these 25 factors have been found to be of not much value in explaining prognosis. Factors from Rorschach (with exception of one viz. W%) are related insignificantly with prognosis and these have usually not been included in the development of weightage scales for predicting response to type of treatment (Kiloh *et al.*, 1962; Mendels, 1965 and 1968; Carney *et al.*, 1965). As a check against the argument that failure of the scale development in the present study might perhaps be due to presence of these 13 Rorschach factors in the multiple regression analysis, it was decided to take into account only the remaining 12 factors (other than the 13 Rorschach factors included in the first multiple regression). Regression co-efficients of these 12 factors as independent explaining variables was determined (Table III) using the regression equation so developed, predicted values for percentage of improvement were obtained for the same 24 cases. To test the agreement between observed and predicted values, a two-way table classifying the cases as having value "above the median and below the median for observed and predicted values" was prepared (Table IV).

This table, however, also shows insignificant association between observed and predicted values.

Since these 12 factors were also found to be of not much value in explaining prognosis and since the validity of including categorical data in a multiple linear regression is not beyond doubt, it was further decided to take into account only five measurable characteristics signifi-

**TABLE 3.** *Showing regression co-efficient and t-value of 12 items included in multiple regression of prediction of improvement*

Item studied	Regression co-efficient	t-value
1) Type of onset (gradual)	-23.167	1.06
2) Duration	- 0.033	0.11
3) Age at time of present onset	+ 3.164	3.71**
4) Age at time of first onset	- 3.662	3.44**
5) History over one year with no symptom free period	-11.675	3.20**
6) Agitation	-16.837	3.39**
7) Adequate premorbid	+31.348	6.76**
8) Adequate psychogenesis	-24.404	5.73**
8) Adequate psychogenesis	-24.404	5.73**
9) Hypochondriasis	- 0.023	0.004
10) 1st day's score on Beck's inventory	+ 0.1095	0.06
11) Score on Barron's ego strength scale	+ 0.504	0.36
12) Score on KNP I	+ 0.670	0.14

\*\* significant at .01 level

**TABLE 4.** *Showing differences in observed and predicted percentage of improvement (prediction based on regression co-efficient of 12 factors)*

		Predicted percentage of improvement		
		Above the median	Below the median	Total
Observed percentage of improvement	Above the median	8	4	12
	Below the median	4	8	12

cantly correlated with percentage of improvement. Regression co-efficients for these five factors taken as independent explaining variables were determined (Table V). Using this equation, pre-

**TABLE 5.** *Showing regression co-efficient and t-values of 5 items included in multiple regression of percentage of improvement*

Item studied	Regression co-efficient	t-value
Age at time of present onset	+0.2503	0.19
Age at time of first onset	-0.1433	0.11
1st day score on Beck's Inventory	+0.2307	0.34
Score on Barron's ego strength scale	-0.1944	0.21
Score on KNP I	-0.2646	1.58

dicted values for percentage of improvement were obtained for the same 24 cases. To test the agreement between observed and predicted value, a two-way table classifying the cases as having values above and below median for observed and predicted values was prepared. This table (Table VI) shows insignificant association between observed and predicted values.

**TABLE 6.** *Showing differences in observed and predicted percentage of improvement (prediction based on regression co-efficient of 5 factors)*

		Predicted percentage of improvement		
		Above the median	Below the median	Total
Observed percentage of improvement	Above the median	7	5	12
	Below the median	5	7	12
Total		12	12	24

Many other authors (Kiloh *et al.*, 1962; Mendels, 1965 b and 1968; Carney *et al.*, 1965) have developed a weightage scale for predicting response to the type of treatment (imipramine in Kiloh *et al.*'s case, E. C. T. in Mendel's and Carney's study). For the scale of Kiloh *et al.* and Mendels, Ability of the scale on new cases (not included in the group, whereupon the weightage are based) has not been tested. No such study testing validity of the scales has been reported. Carney and Sheffield (1972) has reported a study indicating the positive validity of their scale.

But the scale developed in the present study was unable to predict the prognosis of new cases. Here the linear regression is unable to explain the difference in prognosis of a population very similar to one on which it was developed. Though there are many factors related with prognosis (like age of onset, neuroticism, type of onset etc.), it is very difficult to assign them proper weights.

The scale so developed failed to predict the prognosis of the new cases because perhaps there are many other variables (other than the variables studied which are already 60 in number) from social life of an individual which interact to alter the type of response of the patient to the same drug. These variables are not the subject matter of the study, excepting as included in adequate psychogenesis.

It is interesting to observe that factors found to be related with prognosis (with the exception of sleep-disturbances, agitation and depth of depression) are not symptoms of depressive illness; rather these are history factors (like, age of onset, present and first history over one year with no symptom-free period, sudden onset of illness, adequate premorbid personality, adequate psychogenesis) and personality factors (like neuroticism, ego strength). Results of the study therefore suggest that

inclusion of more history and social interaction factors might lead to more fruitful results by way of a better prognosis. Either this is true or one has to admit that the development of such a scale is a very difficult (if not impossible) task. Accordingly, while using such scales (developed by other authors), one must be aware of the limitations of the scales so developed.

#### REFERENCES

- ABRAHAM, H. C., KANTER, V. B., ROSEN, I. AND STANDED, J. L. (1963). A controlled clinical trial of Imipramine (Tofranil) with outpatients. *Brit. J. Psychiat.*, 109, 286.
- AJMANI, S. AND NANDI, D. N. (1973). Adaptation of A. T. Beck et al's "An inventory for measuring depression". *Ind. J. Psychiat.*, 15, 386.
- BARRON, F. (1953). An ego strength scale which predicts response to psychotherapy. *J. Consult. Psychol.*, 17, 327.
- BECK, A. T., WARD, C. H., MENDELSON, M. AND ERBOUGH, J. (1961). An inventory for measuring depression. *Arch. Gen. Psychiat.*, 4, 561.
- CARNEY, M. W. P., ROTH, M. AND GARSIDE, R. F. (1965). The diagnosis of depressive syndromes and the prediction to E.C.T. *Brit. J. Psychiat.*, 111, 659.
- CARNEY, M. W. P. AND SHEFFIELD, B. F. (1972). Depression and Newcastle scale: Their relationship to Hamilton's scale. *Brit. J. Psychiat.*, 121, 35.
- CARNEY, M. W. P. AND SHEFFIELD, B. F. (1974). The effects of pulse E.C.T. in neurotic and endogenous depression. *Brit. J. Psychiat.*, 125, 91.
- KAV, D. W. K., GARSIDE, R. F., BEAMISH, P. AND ROY, J. R. (1969). Endogenous and neurotic syndromes of depression: A factor analytical study of 104 cases: Clinical Features. *Brit. J. Psychiat.*, 115, 377.
- KENDELL, R. E. AND GOURLAY J. (1970). A clinical distinction between Psychotic and neurotic depression. *Brit. J. Psychiat.*, 117, 257.
- KILCH, L. G. AND BALL, J. R. B. (1968). Depression treated with Imipramine: A follow up study. *Brit. Med. J.*, 1, 168.
- KILOH, L. G., BALL, J. R. B. AND GARSIDE, R. F. (1962). Prognosis factors in treatment of depressive states with Imipramine. *Brit. Med. J.*, 1, 1225.

- KUNDU, R. (1963). Item analysis of a new neurotic personality inventory. *J. of Psychol. Research.*, 7, 103.
- KUNDU, R. (1966). A new psychoneurotic inventory for adults. *Indian J. of Psychol.*, 41, 17.
- MENDELS, J. (1965a). Electroconvulsive therapy and depression I. The prognosis significance of clinical factors. *Brit. J. Psychiat.*, 111, 675.
- MENDELS, J. (1965b). Electroconvulsive therapy and depression II Significance and endogenous and reactive syndrome. *Brit. J. Psychiat.*, 111, 682.
- Mendels, J. (1968). Depression : The distinction between syndrome and symptom. *Brit J. Psychiat.*, 114, 1549.