

A Comparison Between the Hamilton Rating Scale and the Beck Inventory in the Measurement of Depression

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Summary. Correlations were made between ratings on the Hamilton Rating Scale for depression and the Inventory for measuring depression devised by Beck. Satisfactory and significant correlations were observed in only two-thirds of the patients, and often very divergent results were found in the remaining third.

In most clinical and research work concerned with affective illness it is essential to assess the severity of depression in the patient. It is advantageous to use measures which are widely known so that results can be compared. Two of the most widely used scales are the Inventory for the Measurement of Depression (DI) developed by Beck (Beck *et al.*, 1961), where the patient rates himself, and the Hamilton Rating Scale (HRS) where the patient is rated by the psychiatrist.

The DI—an American scale—was validated in this country (Metcalf and Goldman, 1965) against the criterion of clinical judgement by a psychiatrist. It consists of 21 groups of items related to a common symptom of depressive illness. The patient has to indicate which statement in each group describes best how he feels at that moment. Each statement is graded according to severity from 0 to 3 and the total score can range from 0 to 60.

The HRS consists of ratings made by a clinician interviewing the patient. Each rating is graded according to severity from 0 to 2 or from 0 to 4. In this study the first 16 items only were used: the maximum total score is 50.

PATIENTS AND METHODS

In the present study 42 patients were assessed by both scales administered on the same day, and on at least seven separate occasions; they were all in-patients of our neuropsychiatric investigation ward and were suffering from a depressive illness (38 unipolar and 4 bipolar in a depressive episode).

The assessments were made at the time of the patients' admission and then over a period of three or six weeks, during which time most of them were successfully treated and were improving. Twenty-four of these patients continued to be assessed on both scales until the time of their discharge from hospital. The clinical states to be assessed ranged, therefore, from severe depression to clinical recovery with loss of most or of all of the main symptoms.

The conditions under which the scales were administered were kept as constant as possible. When completing the DI the patients sat alone or in a small group, in a quiet room under the supervision of a nurse. For the HRS the patients were interviewed by a psychiatrist. Hamilton recommends that two psychiatrists should assess the patient simultaneously and that the score should be the sum of their two assessments. In many reports where the HRS was used by only one psychiatrist the total score was doubled. In the present investigation, only one psychiatrist at a time assessed the patient and the score has not been doubled. The psychiatrist was not aware of the DI score at the time of the HRS rating. Three psychiatrists took part in the investigation.

RESULTS

Our results are based on the product-moment correlation between the total rating scores on each scale. There were 25 occasions when both scales were given to the same patient on the same day, and thus there were 425 pairs of rating scores.

Overall correlation

The overall correlation covering the 425 pairs of scores is statistically highly significant ($r = 0.68, p < 0.001$).

Successive correlations

The correlations obtained on admission and during the first four weeks in hospital are shown in Table I. The two scales correlate less well on admission than at any other time. This may mean that on admission neither of the two scales can adequately reflect the patient's clinical condition. The DI, when presented to very depressed patients for the first time, may be confusing in spite of explanations; and the HRS, when the psychiatrist interviews his patient for the first time and with very scanty background information, will obviously be based on a very incomplete clinical picture. The correlation between admission DI and first week DI was 0.65 and that between HRS on admission and at the first week was less than 0.50.

The correlations between the two scales improve as time goes on and reach a high level of significance in the fourth week after admission. Twenty-four of the 42 patients were assessed regularly on the two scales until the time of their discharge. The correlations for these 24 patients are shown in Table II.

TABLE I
Correlation between scales on admission and thereafter at weekly intervals

| N = 42 | On admission | 1st week | 2nd week | 3rd week | 4th week |
|--------|--------------|----------|----------|----------|----------|
| $r =$ | 0.33 | 0.71 | 0.51 | 0.77 | 0.79 |
| $p =$ | <0.05 | <0.001 | <0.001 | <0.001 | <0.001 |

TABLE II
Correlation between scales on admission, at 4 weeks and at discharge

| N = 24 | On admission | At 4 weeks | At discharge |
|--------|--------------|------------|--------------|
| $r =$ | 0.21 | 0.63 | 0.58 |
| $p =$ | NS | <0.01 | <0.01 |

Assessment of change

Fig. 1 shows the correlations between HRS and DI in individual patients. There is a significant correlation between the two scales in only two-thirds of the cases; in the others the correlation is low or even negative. We looked at various aspects of these patients—severity of their depression, and personality as measured by the Eysenck Personality Inventory (Eysenck, 1959) or the Marke-Nyman Temperament Scale (Coppén, 1966), but we could not find any significant differences from those patients in whom a significant positive correlation was found.

As would be expected from the previous figures, the two scales correlated well in the way they measured the difference between the admission score and a later score. This difference was calculated as a percentage of the initial score. Table III shows these changes at four weeks and at discharge. It should be noted here that the DI shows less percentage change than does the HRS.

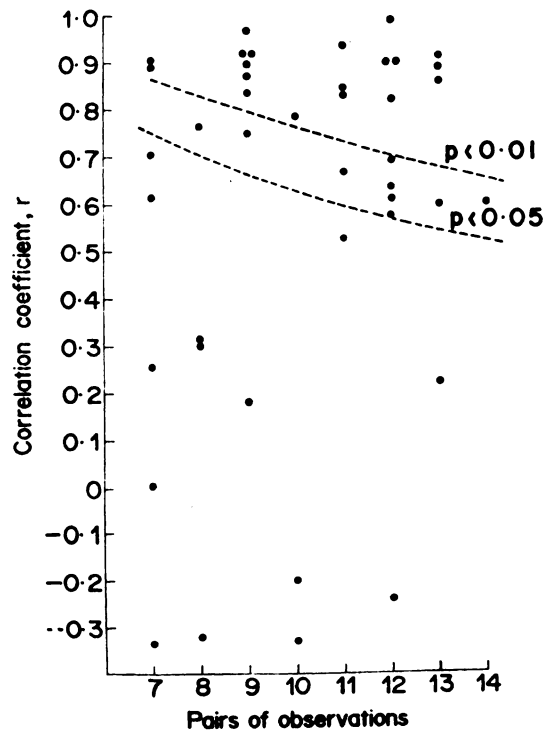


FIG. 1.

TABLE III
Correlation between percentage changes in scales from admission, 4 weeks and discharge

| | N | Mean % change DI | change HRS | r | p |
|---------------------------------|----|---------------------|---------------|------|--------|
| Between admission and 4 weeks | 42 | 37% | 53% | 0.72 | <0.001 |
| Between admission and discharge | 24 | 60% | 80% | 0.55 | <0.01 |

Distribution of scores

In this population of depressed in-patients the highest score obtained on the DI was 56 (maximum score possible = 60) and the highest HRS score was 33 (maximum score possible = 50).

Table IV shows the mean and standard deviation of scores on both scales at various points in time.

Fig. 2 shows the frequency distribution of scores on the two scales on the seventh day after admission when most patients were still ill (although some had already improved) and the overall correlation between the scales was quite high.

Use of rating scores (on admission and after one week) as predictors of clinical outcome

A comparison between the scores on admission or at one week and the score on discharge is shown in Table V.

There is obviously no way of predicting from the HRS on admission, or at one week after admission, the scores the patient will rate on discharge. However, there is a small correlation between the admission or one week score and the discharge score on the DI. It may be that on a self-rating questionnaire which he completes twice a week the patient will remember his answers and tend to reproduce them on subsequent occasions.

DISCUSSION

The results of this investigation have shown a satisfactory concordance between HRS and DI in two-thirds of the cases but a rather poor correlation in the others. There were no obvious

TABLE IV
Scores on DI and HRS (mean and standard deviation) at admission, 7 days and discharge

| | | Admission (N = 42) | At 7 days (N = 42) | Discharge (N = 24) |
|-----|------|-----------------------|-----------------------|-----------------------|
| DI | Mean | 22.0 | 20.6 | 7.1 |
| | SD | 10.6 | 11.8 | 8.0 |
| HRS | Mean | 19.2 | 14.4 | 3.5 |
| | SD | 4.9 | 5.5 | 3.1 |

TABLE V
Correlation between admission and discharge scores on DI and HRS

| | N | Admission/Discharge | | One week/Discharge | |
|-----|----|---------------------|-------|--------------------|-------|
| | | r | p | r | p |
| DI | 42 | 0.31 | <0.05 | 0.33 | <0.05 |
| HRS | 24 | -0.10 | NS | 0.13 | NS |

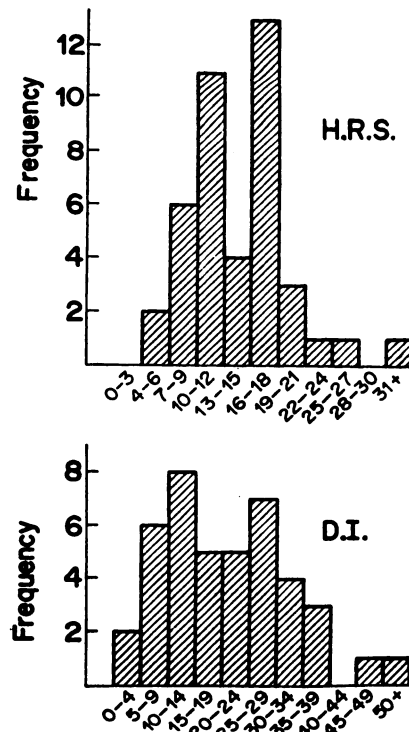


FIG. 2.

characteristics of this latter group that distinguished them either in personality or in severity of illness.

There is no absolute measure of severity of illness, although trained psychiatrists can reach a high degree of reliability in the use of a rating scale like the Hamilton. There are obvious factors that invalidate either clinical interview or self-rating, such as a deliberate denial or exaggeration of the illness, lack of knowledge by the doctor, and so on. In most studies we would feel it useful to have both forms of measurement. The DI has the advantage that it is a standardized form of measurement, enabling comparisons to be made between different centres without the special training in rating needed to give comparable results with the HRS. The time needed for an accurate HRS to be completed is considerable, whereas

the DI can be completed rapidly by a patient under the supervision of a nurse in a few minutes.

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