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Correspondence

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USE OF 1974 A.A.M.D. CLASSIFICATION IN HOSPITALS FOR THE MENTALLY HANDICAPPED

DEAR SIR,

In July 1964, Mr. B. Benjamin, Chief Statistician to the Ministry of Health, wrote to hospitals for the mentally subnormal asking them to use the clinical section of the Classification devised by the American Association on Mental Deficiency for the completion of Box 16 of the Mental Health Enquiry Hospital Index Card A. This Classification was published in a Monograph Supplement to the *American Journal of Mental Deficiency*, September 1959, under the title *A Manual on Terminology and Classification in Mental Retardation* by Rick Heber. As applied in this country by the Ministry this classification did not involve any component to express the intellectual levels of the patients. The classification had the advantage of incorporating a number of supplementary categories to provide additional information about the patients. These were genetic component, secondary cranial anomaly, impairment of special senses, convulsive disorders, psychiatric impairment and motor dysfunction (type, location and severity) respectively.

In November 1969, Dr. A. A. Baker, then Senior Principal Medical Officer in the Department of Health and Social Security, requested hospitals for the mentally handicapped to use the section on Mental Retardation in the World Health Organization International Classification of Diseases, Eighth Edition 1965, in the completion of the Mental Health Inquiry Index Cards. This classification provides for the expression of the intellectual grade and broad aetiological categories, but does not present any other information about the patients.

The inadequacies of both the above classifications have now been largely overcome by the revised classification published by the American Association on Mental Deficiency (A.A.M.D.) under the title *Manual on Terminology and Classification in Mental Retardation* (1973), edited by Herbert J. Grossman. This new classification uses the same code numbers for the intellectual status as the I.C.D. and the same first digits as the I.C.D. for the aetiological categorization. The addition of 2nd and 3rd digits to the aetiological categorization enables much greater clarification and exactitude to be achieved in the expression of the diagnoses. The classification also includes additional medical information categories, similar to those of the 1959 A.A.M.D. Classification, but with a useful section for Disorders of Perception and Expression inserted between Impairment of Special Senses and Convulsive Disorder.

So far there has been no official recommendation to use this Classification in returns to the Department of Health, but this new revised A.A.M.D. Classification is the most comprehensive now available. In hospitals which have already classified their patients according to the 1959 A.A.M.D. Classification and the I.C.D. Classification this revised 1973 A.A.M.D. Classification can readily be applied.

This Classification meets the objections raised by Dr. J. E. Oliver in Correspondence in this *Journal*, (December 1974, 125, 612) about the I.C.D. (Mental Retardation) used alone, and avoids the need for double diagnoses on the W.H.O. Classification.

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INTRACELLULAR LITHIUM CONCENTRATION AND CLINICAL RESPONSE

DEAR SIR,

The possibility of determining the erythrocyte lithium concentration opens new perspectives in lithium salt therapy. In fact, R.B.C.—having the same enzymatic mechanisms of transferring cations across the cell membrane as the nervous cells have—seem to represent a better predictor of the brain Li concentration (Frazer *et al.*, 1973). Indeed, the clinical application of these experimental results to the screening of responders and non responders to lithium seemed to us of relevant interest. Preliminary data exist (Mendels and Frazer, 1973) suggesting that patients suffering from primary affective disorders having a high R.B.C. Li—plasma Li ratio ($>0{\cdot}50$)

would probably display a positive clinical response to Li salt administration. On the contrary, patients having an R.B.C. Li—plasma Li ratio lower than 0·50 would more probably appear as 'non responders'. Thus it is reasonable to assume that such a different Li distribution may reflect some significant difference in cell membrane functioning between responders and non responders, differences that are probably genetically determined (Glenn and Reading, 1973).

Thus, we have determined the plasma and R.B.C. Li concentrations of 25 primary affective disorder patients treated with Li carbonate at our Lithium Unit: 23 subjects were at their third relapse of the disease at least, and they were easily classified as unipolar (12) or bipolar (11) patients. The last two patients, being at their second morbid episode, were of uncertain classification according to Perris (1973). All patients have been followed for a year; their daily intake of Li carbonate was 750–1,250 mg. Blood samples for the estimation of R.B.C. and plasma Li levels were drawn in the mornings before patients had their first daily dose of Li salt. In all cases the laboratory estimation was conducted, independently of any knowledge of the patient's clinical status, by Frazer's method (1972), and was determined for every patient between three and six times during the observation period. The classification of patients as 'responders' rather than 'non responders' has been made according to: (1) the Aitken's self-rating scale evaluated monthly (Crawford and McPhail, 1973); (2) a relapse followed by admission to hospital and/or treatment with high doses of specific drugs.

On the other hand we did not consider it right to classify as 'non responders' patients who had smaller fluctuations of mood that did not impair their usual activity and were controlled easily by low dosages of the specific drugs (for example: 25–50 mg./day of amitryptyline).

Our results are listed in Table I and suggest the following considerations:

(1) The variations of the individual R.B.C. Li—plasma Li ratio can be considered constant, although they display higher fluctuations than those found by Mendels as it appears from the S.E.M.;

(2) According to the findings of Mendels and Frazer (1973) all three non responders have a lithium ratio lower than 0·50;

(3) A puzzling observation is the high number of responders having a R.B.C. Li—plasma Li lower than 0·50. It has to be considered, however, that a longer investigation period could eventually modify the clinical classification of these patients into 'non responders';

TABLE I

R.B.C. Li—plasma Li ratio in affective disorder patients

Patient	Diagnosis	R.B.C. lithium— / Plasma lithium	Clinical response
S.A.	Unipolar	0.20±0.01*	+†
D.E.	Unipolar	0.29±0.07	+
A.R.	Unipolar	0.30±0.01	+
R.E.	Unipolar	0.35±0.01	+
Z.P.	Unclassified	0.37±0.05	+
B.A.	Unipolar	0.39±0.01	−
G.M.	Bipolar	0.41±0.02	+
A.T.	Bipolar	0.43±0.07	−
S.L.	Unipolar	0.48±0.07	+
L.E.	Unipolar	0.50±0.02	−
G.M.	Unipolar	0.50±0.06	+
C.A.	Bipolar	0.52±0.03	+
B.A.	Bipolar	0.52±0.04	+
G.E.	Unipolar	0.53±0.04	+
A.G.	Unipolar	0.58±0.02	+
M.G.	Bipolar	0.60±0.01	+
Z.F.	Bipolar	0.61±0.01	+
B.L.	Bipolar	0.62±0.05	+
B.A.	Unipolar	0.62±0.06	+
F.F.	Unipolar	0.63±0.04	+
F.L.	Unclassified	0.65±0.01	+
B.G.	Bipolar	0.65±0.01	+
A.R.	Bipolar	0.69±0.01	+
P.F.	Bipolar	0.69±0.06	+
B.C.	Bipolar	0.91±0.01	+

* $\bar{x}$±S.E.M.

† + responders; − non responders.

(4) The subdivision of patients according to the intracellular–extracellular ratio, as well as according to the clinical response, does not follow the clinical classification of unipolar and bipolar patients. However, we can note that there is a larger percentage of unipolar subjects with a ratio lower than 0·50.

We have also investigated, under the same conditions, six subjects affected with mixed psychosis and markedly liable to recurrences of schizoaffective episodes. The results are reported in Table II. It can be seen that there is a higher percentage of non responders among these patients than among the primary affective disordered; and in these cases it is not possible to find any relationship between the R.B.C. Li—plasma Li ratio and the clinical response.

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TABLE II
R.B.C. Li—plasma Li ratio in mixed psychosis

Patient	R.B.C. lithium / Plasma lithium	Clinical response
R.L.	0.29±0.01*	+†
M.M.	0.36±0.02	−
C.G.	0.42±0.01	+
L.T.	0.44±0.01	+
G.A.	0.52+0.07	−
A.R.	0.72±0.05	−

*$\bar{x}$±S.E.M.
† + responders; − non responders.

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INTER-RATER RELIABILITY OF WARD RATING SCALES

DEAR SIR,

The enthusiasm with which Dr. Hall encourages the wider use of the weighted kappa statistic in estimating inter-rater reliability of ward rating scales (*Journal*, September 1974, **125**, 248–55) tends to obscure two features common to many statistical computations—that they are prone to errors of arithmetic (especially when computed by hand) and that they must be interpreted with care.

Evidence of the former is taken from Dr. Hall's illustrative examples, in which at first reading seven mistakes were noted in the calculation. It is simplest to list them.

From the first example (on pp. 251–2), the correctly computed values are:

(i) weighted kappa = +0·6719;
(ii) quantity A = 0·025534 (has some of step 7 been mislaid?);
(iii) quantity B = 0·020621;
(iv) quantity C = 0·95367;
(v) variance of weighted kappa = 0·004685.

In the practical example of observations on 12 patients:

(vi) a marginal frequency was incorrectly summed to 27 (instead of 28), and was the probable cause of
(vii) an inaccurate weighted kappa value, which should have been +0·68557.

Secondly, the relative interpretations to be attached to the three reliability measures given in the practical example were not obvious. The data arose from the pooled observations of 12 patients for 12 items on a five-point scale. An implied comparison was made between the product-moment correlation coefficient (computed from the *total* data to have a value of +0·98) and weighted kappa (calculated from the *pooled* data as 0·68557). Such a comparison may be misleading, unless the weighted kappa is corrected to take account of the effects caused by pooling the data. An approximate correction may be made by application of the Spearman-Brown formula (1) which estimates the reliability, r_n, for a test which is n times the length of a test of known reliability r, by

$$r_n = \frac{n \cdot r}{1+(n-1) \cdot r}$$

Since in the case presented $n = 12$ and $r = 0{\cdot}68557$, the appropriate estimate of the total reliability, r_n, is 0·97, which is a more realistic value for comparison with the other measures of reliability of total scores quoted by Hall.

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