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Unusual Mood Stability in Patients Taking Lithium

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Summary: The Visual Analogue Mood Scale (VAMS) was completed for 30 consecutive days by 124 psychiatric patients and 36 non-patient control subjects. The 65 euthymic manic-depressive patients on chronic lithium therapy had similar mean mood ratings to the non-patient controls, but had lower mood variability as measured either by standard deviation of the mood rating or by a measure of the mean successive differences between consecutive mood ratings (delta squared). This unusual mood stability appears to be an effect of lithium therapy. This study thus offers some empirical support for the 'mood stabilizer' psychological model of lithium's effects in patients. It is also noted that this effect may be perceived in well patients as an undesirable effect of lithium treatment.

One approach to self-rating of mood is a direct scaling of mood by means of analogue graphic rating scales. The principle is the same as that used in psychophysical settings in which a subject is required to rate the stimulus intensity directly. This technique was first used in the 1920's and subsequently has been employed for a variety of states. We have used these scales for a number of years and have demonstrated their reliability, validity and clinical utility as a repeated measurement.

Initially we used the VAMS to measure the mood of patients with manic-depressive disorder (Folstein and Luria, 1973). When the VAMS was combined with the digit symbol test, a linkage between mood and cognition in patients with manic-depressive disorder was found. Validity of the scales in that population was established by correlation with Clyde Mood scale and Zung scales (Zung, 1965). Test re-test reliability was also established. Subsequently Luria (1979) demonstrated the capacity for scales assessing mood and alertness to distinguish a group of patients diagnostically who demonstrated the characteristics of manic-depressive disorder phenomenically and demographically. Slavney and Rich (1980) have used the VAMS to demonstrate an increased variability of mood in subjects with hysterical personality. Similar scales have been used to measure a variety of other internal states such as appetite.

Since these scales can be administered serially to patients with mood disorder, they permit the description of the mood of patients taking lithium. The purpose of the current study was to apply the analogue scale method to patients taking lithium in order to compare their mood to the mood of patients not taking lithium and to the mood of non-patients. The hypothesis to be tested was that the patients taking lithium would be similar in mood to non-patients and dissimilar in mood to patients not taking lithium but with manic-depressive disorder or other psychiatric disorders.

Methods and Sample

Inpatients and outpatients of the Westchester Division of the New York Hospital were studied. Age, sex and diagnosis are shown in Table I. One hundred twenty-eight patients and 36 non-patients were tested.

Subjects were given a supply of mood slips in a specially designed envelope which allowed them access to blank slips and provided a slot through which completed slips could be inserted, and through which completed slips could not easily be retrieved by patients. Patients were instructed to complete one mood slip each morning and return the completed pack to the clinic at the time of lithium check. Slips were scored and the mean and standard deviation (SD) for each patient was calculated. Because the standard deviation is a conservative measure of variability, a delta square statistic was also calculated for a subsample of the population. The delta square calculation describes the mean squared consecutive difference of a series of measurements.

Results

Mean mood in lithium-treated patients was similar to non-patients' mean mood and was different from that of manic and depressed patients (Table I). However, patients taking lithium were less variable in

TABLE I

Summary of descriptive characteristics and mood ratings in subjects studied

	Lithium clinic	Manic depressive depressed	Manic depressive manic	Neurotic	Non-patient controls
Total (N)	65	32	8	19	36
Male (N)	21	8	4	2	13
Female (N)	44	24	4	17	23
Age (yrs) ±SD deviation	42±15	51±19	25±12	30±17	38±13
Mean VAMS (mm)	57	48	70	49	63
SD VAMS (median)	8	14	11	16	15
SD Males (median)	7	12	6	13	12
SD Females (median)	9	15	15	16	16
SD vs age (r)	−.12	−.001	.57	−.21	−.50*

* $P < 0.01$.

their mood as assessed by the distribution of the standard deviations of their mood ratings than were non-lithium treated comparison groups. Seventeen of sixty-five (26 per cent) lithium-treated patients had mood standard deviation (SD) values less than 5, while only 4 of the 97 (4 per cent) other subjects had mood SD values less than 5. The distribution of the SD mood values for lithium-treated patients was significantly skewed towards zero as compared to the distribution of the SD mood values of every other group (excepting the manic group) by 5 by 2 chi-squared analyses (Table II).

Delta square values were also calculated in male patients using only the first 5 days of mood rating. The delta square value for 70 per cent (14 of 20) of the euthymic men taking lithium was less than 200. None of the 13 normal male control subjects had delta square values below 200. This difference was statistically significant at the $P < 0.001$ level by the Fisher's Exact Test.

Females were more variable in their moods as assessed by the median SD mood values across diagnostic groups (Table I). The Wilcoxon signed rank test was significant at the $P < 0.05$ level.

The variability of mood was related to age in the non-patients but not in the patient groups. Older non-

TABLE II

Comparison of SD of mood ratings by diagnostic group and by duration of lithium treatment

N		Ranges of mood rating SD with the number of subjects in each range					
		0–4.9	5.0–7.9	8.0–9.9	10–13.9	14+	Median standard deviation
	Group						
65	Lithium clinic*	17	8	12	16	12	8.1
8	Affective manic**	1	2	1	1	3	11.1
32	Affective dep.	2	4	5	5	16	14.4
19	Neurotics	1	1	2	4	11	15.7
36	Non-patient controls	0	6	2	10	18	14.9
	Duration of lithium						
21	Under 6 mos. on Li	6	4	2	6	3	8.2
36	Over 6 mos. on Li	9	7	3	8	9	9.3
28	Under 1 yr. on Li	7	5	2	6	8	9.5
29	Over 1 yr. on Li	8	6	3	6	6	8.1

* Chi-squared analysis of frequency of subjects (a 5 by 2 table) with SD Mood values across the ranges 0 through 14+: Lithium clinic vs. Affective manic, χ^2 is NS; Lithium clinic vs. affective depressed, $\chi^2 = 23.27$, $P < 0.01$; Lithium clinic vs. neurotic, $\chi^2 = 20.67$, $P < 0.01$; Lithium clinic vs. Non-patient control subjects, $\chi^2 = 32.75$, $P < 0.01$.

** Most affective manics were treated with lithium during all or part of the mood testing.

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patients tended to have lower mood SD values than younger subjects (Table I). The variability of mood was unrelated to lithium level or duration of lithium treatment.

Discussion

The experimental group of patients in this study were representative of patients chronically taking the lithium. All had taken lithium for more than 30 days and some had taken lithium for up to 5 years. Of the 30 patients who refused to participate in the study, no difference in age, sex, diagnosis or length of lithium treatment could be determined. All patients in the lithium clinic suffered from manic-depressive disorder and had had at least one episode of mania; thus, all patients could be considered to be bipolar manic-depressive patients. None of the other comparison groups of patients or normal controls were taking lithium with the exception of the patients with manic-depressive disorder manic type who were inpatients and were taking lithium. None of the lithium clinic patients were thought to be manic or depressed during the time of the study.

The method used in the study, that of the visual analogue scale, has been found to be reliable and valid in other settings and not to be vulnerable to response set in short duration studies. This method did demonstrate unusual mood stability in the population of patients taking lithium and none of the comparison groups. However, this fact alone does not allow us to conclude that this mood stability is morbid, that it is the cause of concern of suffering to patients, or that it is caused by the taking of lithium. However, this finding is consistent with several other clinical reports.

Schou (1968) noted that the occasional patient on therapeutic doses of lithium complained of "feeling internally curbed and unable to talk, think and move as fast as they would like". He also reported that this effect "disappears after a certain time even when lithium treatment is continued". In our sample the curbing of mood persisted in some patients up to several years after taking lithium. Schou also reported a number of observations of the effect of lithium on the mood of non-patients. They reported "feeling that mental effort was needed to undertake any physical task" although they did not feel weaker or more easily fatigued. When Schou and his colleagues took took lithium, both emotional lability and diminished responsiveness to environmental stimuli were reported. The latter phenomenon was like the feeling of being separated by "a glass wall" from the environment. Thus, our data could be interpreted as suggesting that subjects taking lithium experience a lessened responsiveness of mood to environmental stimuli. Judd *et al* (1977) reported mood lowering effects of lithium in a 2-week study of normal male volunteers. These subjects also reported "they did not want to deal with the demands of the environment" while on lithium. Kropf and Miller-Oerlinghausen (1979) recently reported a study of the administration of lithium to normal male volunteers, who reported decreased social involvement, concentration and activity, and increased boredom and tiredness while on lithium. Perhaps more directly related to our results are those of Rifkin *et al* (1972), who reported that lithium reduced mood variability in patients with emotionally unstable character disorders.

Thus, from this review of other studies and our own data, we feel warranted in concluding that lithium has a direct effect on mood, which is experienced in the euthymic state of some bipolar patients. This conclusion invites the speculation that lithium normalizes mean mood but suppresses normal variability of mood. Perhaps in this way lithium prevents the wide fluctuations of mood resulting in the symptoms of a manic-depressive disorder. However, further work is needed to specify which individuals will develop unusual mood stability while taking lithium.

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