



## Short communication

## Psychotropic drugs and personality changes: A case of lithium



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## ABSTRACT

**Background:** The effect of psychopharmacological treatment on personality has been mostly studied with antidepressant drugs. Previously, we demonstrated an association between long-term lithium response and affective temperaments measured by the Temperament Scale of Memphis, Pisa, Paris and San Diego-Autoquestionnaire (TEMPS-A), and schizotypic traits, measured by the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE). Therefore, we were interested whether long-term lithium treatment per se may influence personality traits measured by these scales.

**Methods:** The study was performed on 40 patients with bipolar mood disorder (16 male, 24 female) with a mean age of  $46 \pm 10$  years, either hospitalized or attending the outpatient clinic, Department of Adult Psychiatry, Poznan University of Medical Sciences. Among them, twenty patients (8 male, 12 female) have received lithium for 10–33 years, and twenty (8 male, 12 female) have never been exposed to lithium and have been given other mood-stabilizing drugs. Each patient, had the assessment made by the TEMPS-A and O-LIFE, during euthymic state.

**Results:** Patients on long-term lithium treatment were significantly older and had longer duration of bipolar illness compared with non-lithium patients. Lithium-treated patients obtained significantly lower scores of cyclothymic and irritable temperaments on the TEMPS-A, and of unusual experiences, cognitive disorganization and impulsive nonconformity on the O-LIFE.

**Conclusions:** It is hypothesized that the differences in personality, revealed by the TEMPS-A and O-LIFE scales, are related to the long-term treatment with lithium. The decrease in cyclothymic temperament and in cognitive disorganization trait were previously shown to be associated with the therapeutic effect of lithium.

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## Introduction

Can the use of psychotropic drugs change personality in psychiatric patients? The speculations on this topic appeared after the introduction of novel antidepressants such as selective serotonin reuptake inhibitors (SSRIs) in the early 1990s, and have been followed by a number of experimental studies, mainly for SSRIs, using various personality measures. The assessment of personality by the Temperament and Character Inventory (TCI) resulted in a finding, showing that antidepressant treatment can bring about a decrease in a feature of harm avoidance. Such an effect was observed by Hellerstein et al. [1] for sertraline, in dysthymia, and by Agosti and McGrath [2] for fluoxetine and imipramine, in atypical depression. Also, Brody et al. [3] demonstrated such a phenomenon for paroxetine, in responders among major depression and obsessive-compulsive disorder. The

assessment of personality by the NEO-Five Factor Inventory (FFI) has showed that antidepressant treatment resulted in a decrease of neuroticism and an increase of extraversion. Bagby et al. [4] found a decrease in neuroticism and anger hostility, and an increase in extraversion and gregariousness after treatment with antidepressants, both noradrenergic, such as desipramine, as well as serotonergic, i.e. paroxetine and sertraline. Changes in neuroticism and extraversion correlated with changes in depression severity. Also, lower neuroticism and increased extraversion was found after 24-week treatment of depressed patients with fluoxetine, mainly in responders to this drug [5]. A placebo-controlled study with paroxetine performed by Tang et al. [6] confirmed a drug-induced lowering of neuroticism and increased extraversion compared to placebo. Finally, recent five-year observational study by Finnish researchers [7] showed that the changes in personality such as rising extraversion and declining neuroticism were connected with decrease of depression scores and not directly with changes in antidepressant pharmacotherapy.

The use of lithium for a prevention of recurrences in bipolar disorder has been performed for a half of decade. Such a procedure

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is a long-term and it is possible that this pharmacologic management may bring about the changes in personality. However, so far, studies on the effect of lithium on personality have been only performed for a short-term period. Judd [8] found no differences on the California Psychological Inventory after giving lithium for 14 days. Lithium treatment of patients with borderline personality by 6 weeks resulted in an improvement of impulsive symptoms [9].

Previously, we assessed temperamental affective profile using the Temperament Scale of Memphis, Pisa, Paris and San Diego-Auto-questionnaire (TEMPS-A), and schizotypic traits by means of the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE) in 71 patients treated with lithium carbonate for 5–37 years (mean 18 years). The scores obtained on these scales were correlated with the assessment of prophylactic lithium efficacy by means of the Alda scale. The TEMPS-A measures five temperaments: depressive, cyclothymic, hyperthymic, irritable and anxious and the O-LIFE assesses such schizotypic traits as unusual experiences, cognitive disorganization, introversion/anhedonia and impulsive nonconformity. The response to lithium correlated significantly positively with hyperthymic temperament score, and negatively with anxiety, cyclothymic and depressive temperament scores. Also, a significant negative correlation of lithium efficacy was found with cognitive disorganization [10,11]. Recently, using the TEMPS-A scale, similar findings to ours, obtained with lithium, were observed for the response to antidepressant drugs in bipolar and unipolar depression. De Ayuilar Ferreira et al. [12] showed that antidepressant response in such patients correlated negatively with depressive and anxious temperament and, in major depressive disorder patients, complete antidepressant response was associated with hyperthymic temperament.

In view of these observations, we were interested whether long-term lithium treatment per se may influence personality traits as measured with the TEMPS-A and O-LIFE scales. Therefore, the aim of this study was a comparison of affective temperament and schizotypy traits, assessed by these scales, between two groups of sex-matched bipolar patients, one using lithium for more than 10 years and the second, which has never been exposed to lithium.

## Subjects and methods

### Patients

The study was performed on 40 patients with bipolar mood disorder (16 male, 24 female) with a mean age of  $46 \pm 10$  years, either hospitalized or attending the outpatient clinic, Department of Adult Psychiatry, Poznan University of Medical Sciences. The time of recruitment include period between 2012 and 2014. Among the patients studies, twenty (8 male, 12 female) have received lithium for 10–33 years (mean 17 years), and twenty (8 male, 12 female) have never been exposed to lithium and have been given other mood-stabilizing drugs. Psychometric assessment was performed during euthymic state of the patients.

Clinical characteristics of these two groups of patients are presented in Table 1.

Patients in lithium group were significantly older and had longer duration of bipolar illness. The study complied with the principles of the Declaration of Helsinki and was approved by the Bioethics Committee, Poznan University of Medical Sciences. All the patients gave their informed consent after the nature of the procedures had been fully explained to them.

### Psychometric methods

The Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto-questionnaire has been introduced by Akiskal et al. [13],

**Table 1**

Clinical characteristics of experimental and control group. The values are given as mean  $\pm$  SD (range).

	Lithium group N=20	Non-lithium group N=20
Sex	8 males, 12 females	8 males, 12 females
Age (years)	$51.5 \pm 7.9$ (36–62)*	$41.9 \pm 12.3$ (23–60)
Duration of illness (years)	$23.5 \pm 7.0$ (13–40)**	$14.2 \pm 8.1$ (5–35)
Duration of lithium treatment (years)	$16.9 \pm 5.3$ (10–33)	–

\* Significant difference between groups  $p < 0.01$ .

\*\* Significant difference between groups  $p < 0.001$ .

and its Polish version was verified on a large group of college students [14]. In this study, the 110 questions version of the TEMPS-A questionnaire has been used. The evaluation of five temperament domains: depressive (items 1–21), cyclothymic (items 22–42), hyperthymic (items 43–63), irritable (items 64–84) and anxious (items 85–110) was performed. The scoring for each scale was calculated using the mathematical rule: sum of scoring of the variables belonged to such category/number of variables ( $nv$ ):  $(v_1 + v_2 + v_3 + \dots + v_x)/nv$

The O-LIFE scale was proposed by Mason and Claridge [15] and the Polish translation made in the Department of Adult Psychiatry, Poznan University of Medical Sciences was approved by one of the founders of the scale (GC). In the study, the short version of the O-LIFE was used which consists of 43 questions and a tendency to unusual experiences is evaluated on the basis of answers to 12 questions, cognitive disorganization of 11 questions, introvertive anhedonia of 10 questions, and impulsive nonconformity of 10 questions. The scoring for each domain was done in similar way as for the TEMPS-A.

### Statistical methods

Calculations were performed using the Statistica version 7.1 statistical package. Distribution of the results was tested with Shapiro–Wilk test. Since the results were normally distributed, parametric statistical tests were employed. Comparisons of two groups (lithium and non-lithium group) were performed by non-paired Student test. Statistical significance was set at  $p < 0.05$ .

## Results

The scores of affective temperaments and schizotypic traits in two groups studied are shown in Table 2.

In the TEMPS-A, lithium group showed significantly lower scores of cyclothymic and irritable temperament compared with non-lithium group. As to O-LIFE, lithium group had significantly

**Table 2**

Scores (mean  $\pm$  SD) of affective temperaments and schizotypy traits in experimental and control group.

	Lithium group N=20	Non-lithium group N=20
TEMPS-A		
Depressive	$0.47 \pm 0.21$	$0.48 \pm 0.19$
Cyclothymic	$0.38 \pm 0.21$ *	$0.55 \pm 0.27$
Hyperthymic	$0.36 \pm 0.18$	$0.41 \pm 0.29$
Irritable	$0.21 \pm 0.15$ *	$0.33 \pm 0.21$
Anxious	$0.40 \pm 0.27$	$0.47 \pm 0.25$
O-LIFE		
Unusual experiences	$0.17 \pm 0.17$ *	$0.30 \pm 0.22$
Cognitive disorganization	$0.37 \pm 0.24$ *	$0.53 \pm 0.24$
Introversion/anhedonia	$0.37 \pm 0.15$	$0.36 \pm 0.20$
Impulsive nonconformity	$0.21 \pm 0.14$ *	$0.38 \pm 0.24$

\* Significant difference between groups  $p < 0.05$ .

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