

## Short Communications

# Maintenance of Antidepressant Effect of Sleep Deprivation with the Help of Lithium

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**Summary.** The antidepressant effect of sleep deprivation is often not longer than 1 or 2 days. Therefore we investigated systematically the combination of lithium and sleep deprivation on 26 depressive patients (ICD/DSM 296). We measured the depression scores with the Hamilton Depression Scale and the Brief Depression Rating Scale on 4 days. A comparison between sleep deprivation with and without lithium showed a highly significant difference on the 2nd and 3rd days after sleep deprivation. The positive antidepressant effect remained with those who received lithium.

**Key words:** Sleep deprivation – Lithium – Antidepressant treatment – Depressive illness

## Introduction

Sleep deprivation as therapy for depressive patients is a useful antidepressant treatment, but the positive response is often not longer than 1 or 2 days (Pflug and Tölle 1969). Therefore it is very important to look for additional ways to maintain this improvement. The combination with tricyclics has shown an improvement in some patients (Amin 1978; Elsenga and Hoofdakker 1983; Gillin 1983; Philipp and Werner 1979; Wirtz-Justice et al. 1976).

The experience with one of our patients, and a remark of Pflug (1989), together with observations of Baxter (1985), led us to investigate systematically the combination of lithium carbonate and sleep deprivation.

The purpose of this preliminary investigation was to explore whether or not the additional application of lithium prolongs the positive effect of sleep deprivation on depressive patients, (including unipolar depression and the depressive phase of the bipolar disease).

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## Patients and Methods

We investigated 26 inpatients (mean age: 53 years; range: 30–77 years; 18 female, 8 male; ICD 9: 296.1, 296.3; DSM III 296.23, 296.24, 296.53, 296.54) who were all treated continuously with antidepressant medication (tricyclics, tetracyclics), which was continued during the sleep deprivation procedure (36 h). Sleep deprivation was started in the 3rd week after admission to hospital.

We measured the depression scores with the Hamilton Depression Scale (HAM-D, Hamilton 1960) and the Brief Depression Rating Scale (BDRS, Kellner 1986) the day before and the 1st, 2nd, and 3rd day after sleep deprivation. Thirteen subjects were given lithium carbonate (levels: 0.4–0.8 mmol/l) beginning 1 week before sleep deprivation therapy began and continuing throughout the period of inpatient treatment. The other 13 subjects had no lithium.

The scores were calculated by analysis of variance (split-plot design with repeated measurements on factor B), factor A with two treatments: A<sub>1</sub> without lithium, A<sub>2</sub> with lithium; factor B with four treatments: B<sub>1</sub> the day before, B<sub>2</sub> the 1st day after, B<sub>3</sub> the 2nd day after, B<sub>4</sub> the 3rd day after sleep deprivation.

## Results

The comparison between sleep deprivation without (A<sub>1</sub>) and with (A<sub>2</sub>) lithium carbonate showed a highly significant difference the 2nd and 3rd day after sleep deprivation. The positive antidepressant effect was maintained on those who were given lithium; this could be seen in both scales (Table 1).

## Discussion

In this preliminary study we found that the relapses after sleep deprivation could be prevented by the addition of lithium carbonate. However, as this was not a double-blind, placebo-controlled study, the results are of limited value from the methodological point of view.

The antidepressant effect of lithium in combination with tricyclics alone should be mentioned here. This can

**Table 1.** Table of variance, simple main effects, means of HAM-D (Hamilton Depression Scale) and BDRS (Brief Depression Rating Scale)

Source		HAM-D		BDRS	
		F	P	F	P
A		5.3	0.03	8.5	<0.01
B		48.8	<0.01	37.0	<0.01
A × B		16.4	<0.01	12.7	<0.01
Simple main effects		HAM-D		BDRS	
Source		F	P	F	P
A on B 1		0.06	0.805	7.3	<0.01
A on B 2		0.3	0.582	1.8	0.18
A on B 3		38.4	<0.01	51.8	<0.01
A on B 4		60.9	<0.01	59.3	<0.01
B on A 1		25.4	<0.01	26.9	<0.01
B on A 2		39.8	<0.01	22.9	<0.01
		B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>
		Before SD	1st day after SD	2nd day after SD	3rd day after SD
A <sub>1</sub>	HAM-D	16.54	9.08	14.38	15.08
Without lithium	BDRS	29.38	19.38	27.46	27.69
A <sub>2</sub>	HAM-D	16.31	8.54	8.46	7.62
With lithium	BDRS	25.69	17.54	17.62	17.15

take place within 48 h, as observed by Schöpf (1989) and Stein and Bernadt (1987). Our hypothesis that sleep deprivation has an additional antidepressant effect in combination with lithium is suggested by the observation that the improved mental state occurred directly after the sleep deprivation and continued for longer than the 3 days on which we tested the patients.

After our systematic empirical study we saw a continuing improvement by repeating this procedure (sleep deprivation and lithium) weekly, especially on chronic depressive patients with mood-congruent delusions and a high suicidal risk. Therefore, its use may be recommended in depressions refractory to conventional thymoleptic drug treatment.

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