Eur Arch Psychiatr Neurol Sci (1986) 235:339–341

European Archives of Psychiatry and Neurological Sciences

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Sleep During Mania in Manic-Depressive Males

P. Linkowski, M. Kerkhofs, C. Rielaert, and J. Mendlewicz

Department of Psychiatry (Sleep Laboratory), Erasme Hospital, Free University of Brussels, B-1070 Brussels, Belgium

Summary. Sleep polygraphic recordings were performed in six unmedicated male manics, in age and sex matched unipolar and bipolar depressives and in normal controls. No difference was evidenced between manics, depressives and controls when percentages of sleep stages 1, 2, 3, 4 and REM were considered. Manics demonstrated poorer sleep efficiency, longer sleep onset latency and reduced sleep period time than normal controls but no more so than in our depressed patients. None of the classical sleep disturbances reported in depression (short REM latency, decreased delta sleep and increased REM density) were observed in mania suggesting that with the exception of sleep continuity disturbances, sleep in mania is comparable to sleep in normal subjects.

Key words: Sleep – Manic-depressive illness – Depression – REM sleep

Introduction

Until now, little data exist on sleep disturbances in manic patients. Difficulties in obtaining a valid set of EEG recordings in unmedicated manic or hypomanic patients are probably responsible for this lack of information.

Some results are available from case reports (Mendels and Hawkins 1971), studies of medicated manics (Hartmann 1968; Muratorio et al. 1968), hypomanic personalities (Akiskal and Lemmi 1983) or longitudinal investigations of manic depressive patients who switch in either mania or depression (Bunney et al. 1972; Kupfer and Henninger 1972; Gillin et al. 1977; Post et al. 1977; Mendelson et al. 1977; Knowles et al. 1979).

In a study of 5 manic patients, Muratorio et al. (1968) observed a marked reduction of total sleep time and stage 4 as well as an increase in awake time, a finding replicated by Mendels and Hawkins (1971) and Hartmann (1968); Akiskal and Lemmi (1983) however found no difference in total sleep time and percentage of delta sleep in 12 hypomanic patients.

Data on REM sleep variables are also ambiguous. REM latencies have been found to be normal during hypomania or mania (Hartmann 1968; Muratorio et al. 1968; Mendels and Hawkins 1971; Gillin et al. 1977) while Post et al. (1977) and Akiskal and Lemmi (1983) reported shortened REM latencies in their patients, similar to that observed in depression.

REM densities during mania and/or hypomania were low to normal in the study of Gillin et al. (1977) and Post et al. (1977) while Akiskal and Lemmi (1983) found no difference in REM density between hypomanic, depressed and control subjects.

In the present study, we report EEG sleep findings in manic bipolar and depressed bipolar males, age and sex matched to unipolar depressed patients as well as to normal controls.

Offprint requests to: P. Linkowski at the above address

Methods

We studied six manic bipolar patients aged 26 to 67 years (mean ± SD 51 ± 14 years). These patients were age and sex matched as closely as possible to six male depressed bipolars (BP1) (aged 31 to 60, mean 49 ± 13), to six male depressed unipolars (aged 31 to 60 mean 44 ± 5) and to six male controls (aged 26 to 62 mean 44 ± 6). All patients fulfilled the Research Diagnostic Criteria for manic disorder, bipolar depression with mania as well as recurrent unipolar major depressive disorder (Spitzer et al. 1978) after completing the Schedule of Affective Disorders and Schizophrenia (Spitzer and Endicott 1978). All patients and controls were interviewed by the same psychiatrist (P. L.).

Severity of depression was assessed by the Hamilton Rating Scale (24 items NIMH version) (Hamilton 1960). Manic behaviour was quantitated using the Beigel-Murphy manic scale (Beigel and Murphy 1971; Murphy et al. 1974).

Controls were paid volunteers free of any current or past mental illness and had no family history of psychiatric disorders. All patients and controls were in good physical health according to somatic examination and routine laboratory tests. Manic patients were studied after a drug wash-out period of a least 8 days; none of the patients presented a drug-induced manic switch. None of the patients had received regular lithium treatment during a 3-month period before admission nor presented with a marked admixture of manic and depressive symptoms. Duration of the manic episode ranged from 4 to 15 days before admission. Depressed patients were studied after a drug wash-out of at least 2 weeks. All patients were inpatients hospitalized for an acute episode of their illness. Patients and controls were investigated in the Sleep Laboratory of the Department of Psychiatry, Erasme Hospital, Free University of Brussels between February 1981 and June 1984.

The protocol consisted of an accomodation night and 3 recording nights. Sleep EEG recordings were usually scored following standard criteria (Rechtschaffen and Kales 1968) by an experienced rater not aware of the diagnosis of the patient. The following sleep variables were analyzed: time in bed,

Time in bed (TIB) (min): time from the lights out until standing up
Sleep onset latency (SOL) (min): time from lights out until the appearance of the first 20 s of stage 1.
Sleep period time (SPT) (min): TIB − (SOL + time awake before standing up)
Total sleep time (TST) (min): SPT − awake time during the night
Number of stage shifts: NSS
Sleep efficiency index (SEI): ratio of TST to TIB × 100
Percentage of each stage of sleep expressed as a ratio to TST
REM latency: minutes from the first stage 2 until the first REM epoch
REM density (RD): ratio of REM activity to the total duration of REM sleep

Fig. 1. EEG sleep variables

sleep period time, total sleep time, sleep efficiency, sleep onset latency, number of stage shifts, percentage of stage awake, 1, 2, 3, 4, REM, REM latency and REM density. All these variables have been previously defined (Kerkhofs et al. 1985) (see Fig. 1). In particular, REM latency was defined as the interval between first epoch of stage 2 and first epoch of REM. Due to technical difficulties and variable compliance to the protocol, a total of 14 nights were obtained in our six manic patients (the more severely manic patient had 1 recorded night while two other manics had 2 recorded nights). All other patients and controls had 3 recording nights.

Statistical analysis was performed using non-parametric (Kruskall-Wallis) analysis of variance (Marascuillo and McSweeney 1977); Mann-Whitney tests were used in post hoc group comparisons.

Results

Severity of the clinical state of our manic patients, as measured by the Beigel-Murphy scale, ranged from 114 to 355 (mean 196 ± 88). No significant difference was observed in the severity of depression between unipolar (Hamilton score 36 ± 6) and bipolar depressed patients (35 ± 3).

Table 1 shows the sleep EEG results in the four groups of subjects.

No difference was observed for time in bed between all subgroups. Sleep period time was however significantly reduced in manic patients when compared to controls ($P < 0.02$). An overall reduction in the total sleep time was present in the three patients groups, manic patients spending significantly less time asleep than controls ($P < 0.02$) while no significant differences were observed between manic, unipolar and bipolar depressed patients. Sleep efficiency was significantly reduced in manics ($P < 0.05$), unipolars ($P < 0.05$) and bipolars ($P < 0.02$) than in controls but was comparable in all the patients. Longer sleep latencies were present in manic patients ($P < 0.02$) and unipolars ($P < 0.05$) than in controls.

Percentages of stages 1, 2, 3, 4 and REM did not differ among subgroups although a trend towards a reduction of slow wave sleep (stage 3 and 4) was observed in the two depressed subgroups. REM latencies were shorter in unipolars when compared to controls ($P < 0.05$) and to manics ($P < 0.05$). Manic and bipolar depressed patients showed normal REM latencies i.e. similar to these observed in our controls.

The statistical analysis failed to show a significant difference for REM density measurements ($P = 0.07$), unipolars patients showing however a trend towards greater REM density values.

Discussion

Our data are in good agreement with previous reports of Muratorio et al. (1968), Hartmann (1968), Mendels and Hawkins (1971) and Knowles et al. (1975) showing reduced sleep period time but normal REM latencies during mania. With a careful control for age and sex and matching of our manic pa-

Table 1. Sleep variables in patients and controls[a]

	Mania	Bipolar depression	Unipolar depression	Controls	Kruskall-Wallis
Sleep architecture ($X \pm SD$)					
Percentage stage A	15 ± 15	23 ± 15	27 ± 19	10 ± 5	N.S.
Percentage stage 1	15 ± 11	34 ± 14	20 ± 9	21 ± 8	N.S.
Percentage stage 2	51 ± 20	47 ± 9	47 ± 8	52 ± 7	N.S.
Percentage stage 3 + 4	11 ± 13	4 ± 4	4 ± 7	11 ± 20	N.S.
Percentage stage REM	14 ± 8	17 ± 8	23 ± 8	15 ± 2	N.S.
Sleep continuity ($X \pm SD$)					
Time in Bed (min)	401 ± 122	490 ± 51	449 ± 19	468 ± 34	N.S.
Sleep period time (min)	324 ± 121	431 ± 24	410 ± 29	448 ± 38	$P < 0.05$
Total sleep time (min)	254 ± 115	279 ± 76	292 ± 79	400 ± 31	$P < 0.05$
Sleep efficiency (%)	65 ± 21	68 ± 11	64 ± 16	86 ± 4	$P < 0.05$
Sleep onset latency (min)	40 ± 29	35 ± 22	28 ± 15	10 ± 11	$P < 0.05$
Number of stage shifts	143 ± 90	237 ± 51	190 ± 28	216 ± 80	N.S.
REM sleep ($X \pm SD$)					
REM latency (min)	62 ± 15	65 ± 75	32 ± 13	80 ± 47	$P < 0.05$
REM density	0.65 ± 0.44	0.9 ± 0.52	2.1 ± 0.5	0.83 ± 0.5	N.S.

[a] Average values for all nights

tients with both unipolar and bipolar depressives, no difference emerged between manics, depressives and controls, when percentages of sleep stages 1, 2, 3, 4 and REM were considered. Manic patients also demonstrated poorer sleep efficiency and longer sleep onset latency than normals but no more so than in our depressed patients. Furthermore, none of the classical sleep disturbances reported in primary depressives (shortened REM latency, increased REM density and decreased delta sleep) were observed in our group of manic patients; this is in agreement with previous reports (Mendels and Hawkins 1971; Knowles et al. 1975) and suggests that with the exception of sleep continuity disturbances, sleep in mania is comparable to sleep in normal subjects. As previously noted by Feinberg et al. (1982) ,specific sleep disturbances were more often observed in our unipolar than in our bipolar subjects, namely shortened REM latency and higher REM density values. A number of other biological tests, mainly neuroendocrine, have been found to be normal in manic patients. No difference in thyroid stimulating hormone (TSH) response to thyrotropin releasing hormone (TRH) in manics compared to controls was found by Coppen et al. (1980) or Tanimoto et al. (1982) while Extein et al. (1982) found significantly lower TSH responses to TRH in a group of manic patients compared to controls.

The study of cortisol metabolism in mania has also given ambiguous results: Schlesser et al. (1980) found no abnormality of the dexamethasone suppression test (DST) in 60 manics receiving medication, while nonsuppression in the DST was found in 50% of 16 manic patients (Stokes et al. 1984). Inclusion of patients with mixed (manic and depressive) symptomatology could partly explain some of the discrepancies observed in the above studies as suggested by Feinberg and Opler (1984). While our preliminary study suggests that sleep in manics lacks some of the classical sleep disturbances observed in depression further studies of larger samples of "pure manics" could shed more light on putative sleep and biological differences between manics and depressed patients when compared to normal controls.

Acknowledgements. Supported by grants from the F.R.S.M., the University of Brussels and the A.E.S.M., Mrs. A. Chevalier typed the manuscript.

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Received September 1, 1985