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Journal search and commentary

Twins are not always the best method to evaluate sleep in psychiatric disorders

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1. Article reviewed

Title: Seasonal changes, sleep length and circadian preference among twins with bipolar disorder.

Authors: Hakkarainen R, Johansson C, Kieseppa T, Partonen T, Koskenvuo M, Kaprio J, Lonnqvist J.

Journal: BMC Psychiatry 2003;3:6 [<http://www.biomedcentral.com/1471-244X/3/6>].

2. Objectives

To determine the seasonal changes in mood and behaviour and the persistence of the circadian type for mono- and dizygotic twins discordant for bipolar disorder.

3. Study design

Clinical case study based on questionnaires.

4. Study population

Study participants were searched within the Finnish Population Register to locate twins born between 1940 and 1969. Patients were identified with ICD-8 codes 296.10 or 296.30 in 1969–86 [21], or DSM-III-R codes 296.4, 296.5 or 296.6 in 1987–91. From 67 subjects there were 13 for whom only one of the twin pair participated and 54 (27 twin pairs) for whom both twins participated. These 54 included 20 dizygotic and six monozygotic twin pairs for which the proband twin had bipolar disorder (BP). One pair of monozygotic twins who were both healthy was also included. For the 20 dizygotic pairs two were concordant for BP and 18 discordant, with the other twin diagnosed with alcohol abuse for two, depression for two and considered healthy for 14. For the six monozygotic twin pairs with both twins participating three were concordant for

BP and two discordant, with the other twin diagnosed as schizophrenia for one and healthy for the other. Among the 13 subjects with only one of the twins participating there was only one monozygotic twin pair where the twin without BP was diagnosed with depression. The remaining 12 dizygotic twins included three concordant for BP and nine discordant (4 healthy, 2 schizophrenia, 1 alcohol abuse, 1 depression and 3 healthy).

5. Methods

Diagnosis was assessed by interviewers, blind to zygosity in each of the probands, by the structured clinical interview for DSM-IV diagnoses. The zygosity determination was based on genetic marker analysis and by the questionnaire on resemblance during childhood. The analysis was based on the self-report Seasonal Pattern Assessment Questionnaire (SPAQ), which includes six subscales to assess the seasonal variation in the length of sleep, social activity, mood, weight, appetite and energy level. The sum of these six scales yields the Global Seasonality Score (GSS), ranging from 0 to 24. The SPAQ also investigates changes in well being attributed to local weather conditions. The sum of these 10 scales yields a global score, designated as the Global Weather Score (GWS), ranging from –30 to +30. Of the 61 subjects 36 (62%) sent back the Morningness–Eveningness Questionnaire (MEQ). Sleep length and subjective feelings of sleep debt were studied using the data derived from the Finnish Twin Cohort Questionnaire (FTCQ) administered in 1975, 1981 and 1990.

6. Results

The final analyses included 39 subjects with bipolar disorder and 20 healthy subjects. Twins with bipolar disorder had most (31%) of their hospital admissions during

autumn, but the seasonal distribution of hospital admissions did not match with the self-reports of feeling worse. The period of sleeping most did coincide with the admissions, whereas the period of sleeping least did not.

There were significant differences in the extent of seasonal changes in mood, weight, appetite, and levels of energy, as well as in the GSS, between the bipolar and healthy twins with greater changes in the bipolar twins.

In the pairs discordant for bipolar disorder, there were greater seasonal changes in sleep length and mood, and the GSS in the bipolar twins compared with their healthy co-twins. In addition, sunny days had a greater positive effect on well being in the bipolar than in the healthy co-twins.

The bipolar twins slept longer compared with healthy twins.

There was stability of circadian preference, and the preference for morning activities tended to become slightly more prevalent with ageing. There were no significant associations between the circadian type and the seasonal changes in length of sleep, weight, or appetite.

7. Conclusions

The data confirm the existence of seasonal variation in bipolar disorder and that the exposure to natural light appears to have a substantial effect on well being. Patients with bipolar disorder were not more often evening types.

8. Comment

This study confirms the existence of changes in circadian rhythms in patients with bipolar disorder and the effect of natural light, especially on sunny and dry days, on the well-being of patients and to lesser extent healthy subjects. The analysis of twin pairs discordant for bipolar disorder seems particularly valuable. Bipolar twins show greater seasonal changes in sleep length and mood compared with their healthy co-twins.

However, the study is limited by a number of methodological problems. The authors do not distinguish between bipolar I and II disorder, which may be due to the more than 20 years covered by the study and the change of diagnostic systems therein. The study aimed to investigate twin pairs, but since some of the co-twins refused to participate, all subjects were included in an analysis of bipolar patients versus healthy controls. Therefore, the authors presented data on patients with bipolar disorder,

healthy probands, and twin pairs dis- and concordant for bipolar disorder. They further included in the study data from another survey completed many years before. From Section 5 it seems likely that all the recruited probands were already investigated decades ago, but it is not clear whether all, or only a fraction of the probands presented here were included in the former study. No information is given as to whether/how many of the probands were already ill at the time points of the former study. More problematic is constructing relations between results spanning decades, as has been done in this paper; sleep is known to undergo age and specific disease-related changes such as disturbances in falling asleep, increases in intermittent awakenings, and early morning awakening.

Unfortunately, the authors were not able to provide information on the medication of the patients. Sleep length and well being in particular would be affected by psychopharmacological treatment.

The most interesting results—those on the twin-pairs dis- or concordant for bipolar disorder—play only a minor role in that paper. This may be partly due to the small sample size, e.g. no monozygotic twin-pair completed all questionnaires. Therefore most of the results of the study were obtained by comparing patients with bipolar disorder with healthy controls. This presentation of the data, however, leads one to question why the authors did not increase the number of bipolar patients and unrelated healthy controls instead of choosing twins, which would have also circumvented the uncertainty about whether the discordance for bipolar disorder of the twins was stable. An apparently healthy twin might already have a predisposition to bipolar disorder, although the disease is usually diagnosed before the age of 30 and the study patients were well beyond that age.

Another factor that might interfere with results is substance abuse, which is extremely common among patients with bipolar disorder. Alcohol dependence has been reported in approximately one third of those with bipolar I and one fifth of those with bipolar II disorder. The authors do not report any co-morbidity; therefore it is unclear whether any such secondary disease existed in the study population.

Obviously the authors made large efforts to recruit subjects, and it is therefore a pity that they did not provide more information about sleep and did not include more specific, sleep related questionnaires and objective measurements such as actigraphy.

In summary, the paper yields some interesting results, especially in documenting that those with bipolar disorder show greater seasonal changes in sleep length and mood compared to their healthy co-twins.