

Original article

# Sleep complaints in women of ages 40–64 years in relation to sleep in their parents

Ragnar Asplund<sup>a,b,\*</sup>, Hans Åberg<sup>a</sup>

<sup>a</sup>Family Medicine Stockholm, Karolinska Institutet, SE 141 57, Huddinge, Sweden

<sup>b</sup>Center for Studies in Health and Quality of Life (CSL), Mid Sweden University, SE 831 25, Östersund, Sweden

Received 27 October 1999; received in revised form 25 May 2000; accepted 25 May 2000

## Abstract

**Objective:** To study the occurrence of sleep complaints in women in relation to such complaints in their parents.

**Background:** Sleep complaints are common and may be affected by many somatic, mental, and life-style and environmental factors.

**Methods:** A cross-sectional questionnaire survey was undertaken among 3669 randomly selected women of ages 40–64 years. The women were asked about their own health and sleep and their recollection of the sleep of their parents.

**Results:** The frequency of poor sleep was low among women reporting that neither parent had sleep disturbances. Sleep disturbances in the father, mother and both parents implied a 2.5 (95% confidence interval, 2.0–3.2), 2.5 (2.1–3.0) and 4.8-fold (3.4–6.8) increase in sleep complaints in the investigated women, respectively. The frequencies of numerous awakenings, difficulty in falling asleep again and too little sleep increased similarly. A series of logistic regression analyses revealed that all sleep characteristics were evaluated more negatively in women who reported sleep disturbances in their parents and also reported themselves to be in poor health. All sleep variables deteriorated with age. Because data regarding parent sleep was based on subjects' recall of that sleep, the results should be interpreted with some caution.

**Conclusions:** The frequency of sleep complaints in women aged from 40 to 64 years was increased if sleep disturbances were reported in their parents. © 2001 Elsevier Science B.V. All rights reserved.

**Keywords:** Familial aggregation; Middle age; Sleep complaints; Sleep quality; Women

## 1. Introduction

Sleep complaints may be caused by a number of somatic diseases and symptoms, by certain mental disorders and by medications and life-style factors [1]. Sleep is also influenced by genetic dispositions. Narcolepsy and sleep-walking, as well as nightmares, show hereditary traits [2–4]. Seriously disturbed sleep occurs in some hereditary diseases, such as fatal

familial insomnia, the Norrie disease, the Prader–Willi syndrome and the Moebius syndrome [5]. Great similarities in sleep length and the occurrence of sleep disturbances have also been found in human twins [6].

The present study is part of a comprehensive investigation of middle-aged women. The aim of this study was to determine whether women whose parents had sleep disturbance differ from women whose parents did not have sleep disturbance. Furthermore, we evaluated whether any other possible influences on sleep, such as health and age, might have affected the rela-

\* Corresponding author. Tallvägen 3, 833 34 Strömsund, Sweden.  
Tel.: + 46-670-100-07; fax: +46-63-16-56-26.

E-mail address: rasplund@telia.com (R. Asplund).

tionships between sleep in the women under investigation and the recalled sleep of their parents.

## 2. Materials and methods

The study was carried out in the County of Jämtland in Northern Sweden, with a total population of 135 910 in 1993. There were 19 639 women of ages 40–64 years. Of these, a stratified, random selection of 1200 women in every 5-year age interval received a questionnaire during the first 3 months of 1993. One more questionnaire was sent to those who did not respond within 1 month.

The questionnaire was answered initially by 3019 women. After a reminder a further 650 answers were received. Forty-three women declined to participate. The response rate was thus 60.4% for the whole group and decreased from 66.2% in the 40–44-year age group to 55.8% in the 60–64-year age group.

The women were asked about their general state of health, and diseases and symptoms. One section of the questionnaire dealt with sleep-related symptoms during the last three months. Sleep was analyzed by four statements viz: 'I have a good night's sleep', 'I often wake up at night', 'I easily fall asleep again after a nocturnal awakening' and 'I am often troubled with nightmares' with the alternative answers 'yes' or 'no'.

In relation to this information on sleep, two statements on the parents' sleep were analyzed: 'My father has/had a good night's sleep', and 'My mother has/had a good night's sleep', both with the alternative answers 'yes' or 'no'. The women were also asked about the sleep of their children. The participants' own sleep complaints were analyzed in relation to sleep disturbances in their parents and their offspring.

The study was approved by the Ethics Committee of the University of Umeå.

### 2.1. Statistical methods

Standard methods were used for calculating mean values and standard deviations. Group comparisons of non-numerical data were performed with the chi-square test. The unpaired *t*-test was used for comparison of two groups of numerical data, and analysis of variance (ANOVA) for three or more groups. Crude odds ratios (OR) with 95% confidence intervals (CI) were calculated. For simultaneous evaluation of the

influence of more than one independent variable on sleep, logistic regression analysis (StatView 5.0 for Macintosh) was performed.

## 3. Results

### 3.1. General

Of the total population, 90.2% reported good health, 77.3% were married or cohabiting and 82.8% were gainfully employed.

### 3.2. Sleep in relation to sleep in the parents

Information about sleep in both parents was given by 87.8%, in the father by 89.2% and in the mother by 91.5%. There were no differences in age (Table 1) or in health between the group which reported sleep disturbances in the parents and women who did not. Nor were there any differences in the percentage number of being married or cohabiting, number of children living at home, working hours or the occurrence of night work between them.

Sleep disturbances in the mother were reported four times more frequently than those in the father. Investigated women who answered yes to the statement 'I have a good sleep' had less common one parent with sleep disturbances, and this was even more marked when both parents were reported to be poor sleepers (Table 1). Sleep disturbances in the father, mother and both parents implied a 2.5 (2.0–3.2) (OR; CI 95%), 2.5 (2.1–3.0) and 4.8-fold (3.4–6.8) increase in sleep complaints in the investigated women, respectively.

Among the women who themselves had sleep

Table 1

The age of the investigated women and their own evaluation of their night's sleep in relation to the reported occurrence of sleep disturbances in their parents<sup>a</sup>

Sleep disturbances in parents	No.	%	Age	Good night's sleep (%)
Neither	2034	(62.4)	51.4 ± 7.2	87.7
Father	213	(6.5)	51.0 ± 7.3	72.4
Mother	871	(26.7)	51.1 ± 7.1	73.6
Both	142	(4.4)	50.6 ± 7.1	59.8
Total	3260	(100.0)	51.2 ± 7.2	81.8*

<sup>a</sup> \**P* < 0.0001.

complaints, 19.7% reported sleep disturbances in their father and 48.7% in their mother. Among the women whose parents had no sleep disturbances, 2.8% had had difficulty in sleeping at night on all or most nights during the last three months. In the groups reporting sleep disturbances in the father, mother and both parents, the corresponding frequencies were 7.8, 5.2 and 8.7%, respectively ( $P < 0.0001$ ). The frequencies of numerous awakenings, difficulty in getting back to sleep and insufficient sleep increased similarly.

The total sleep time and the length of time up to the first awakening were shorter among women reporting that either parent had sleep disturbances, and were even more shortened when this applied to both parents. Moreover, the interval between going to bed and going to sleep (the latency time) was prolonged, the number of awakenings was larger and it took longer to fall asleep again after waking in the night. Sleep disturbances in the father, mother and both parents implied a 2.0 (1.6–2.5), 1.8 (1.6–2.1) and 3.9-fold (2.7–5.5) increase in frequent awakenings in the investigated women.

Among the women whose parents had no sleep disturbances, 9.7% had woken up much too early on most or all mornings during the last 3 months. In the groups reporting sleep disturbances in the father, mother and both parents, the corresponding frequencies were 12.1, 12.6 and 17.0%, respectively, ( $P < 0.0001$ ). In the same groups 0.9, 2.4, 1.3 and 2.2% ( $P < 0.0001$ ), respectively, had woken up with a feeling of despair on most or all mornings during the last 3 months.

### 3.3. Nightmares

Of the investigated women, 8.0% reported nightmares. Among those whose parents had not had sleep disturbances this frequency was 5.7%, and in the groups reporting such disturbances in the father, mother and both parents the corresponding figures were 13.4, 10.7 and 16.8%, respectively ( $P < 0.0001$ ). Nightmares 6–7 times per week occurred in 0.3, 2.5, 1.3 and 2.2% of these four respective groups ( $P < 0.0001$ ).

### 3.4. Sleep in offspring of index persons

Sleep disturbances in their children were reported by 4.8% of the women with good sleep and 13.2% of

those with poor sleep ( $P < 0.0001$ ). If the father, mother and the index woman herself had sleep disturbances, sleep such disturbances in the index woman's children were 8.2 (4.4–18.1) times more likely than if the father, mother and index woman all had good sleep.

### 3.5. Multiple logistic regression analysis

A series of logistic regression analyses was performed with sleep, frequent awakenings, difficulty in falling asleep, and nightmares as the dependent variable and age, general health and parents' sleep as explanatory variables. The analysis indicated that all sleep characteristics of the index women were more negatively influenced by the simultaneous occurrence of sleep disturbances in their parents than by age or poor health, respectively (Table 2).

## 4. Discussion

This questionnaire study showed that women aged 40–64 years more often had sleep complaints when they reported that their parents had sleep problems. Sleep complaints were generally more pronounced in the women who reported that both parents had sleep disturbances than in those with only one parent with such disturbances, and were least pronounced in women whose parents had had a good night's sleep.

In spite of the distinct data obtained in this study on the relationship to sleep in the parents it is important to be cautious in the interpretation. Some weaknesses in a study like ours will be dealt with below.

The participation was 60% of a relatively large initial population, but still the non-response rate was fairly high. On the other hand, the non-response rate for questions in the questionnaire was low. Information on the parents' sleep was given in 90% of the questionnaires and the response rate for the other questions was generally more than 90%.

Two important questions are whether the questionnaire method gives reliable information on sleep and whether one's parents' sleep behaviour is easily recalled. Some support for the fact that questionnaires can be used to get reliable data on sleep is available. For example, there is a consistent correspondence between reports on sleep complaints and findings at different sleep measurements [7] and laboratory

Table 2

The variables night's sleep, frequent awakenings, difficulty in falling asleep again and frequent nightmares in relation to reported sleep disturbances in the parents and to the age and health of the index women. Odds ratios and 95% confidence intervals for each of the variables included in the logistic model are given<sup>a</sup>

Variables	Night's sleep		Frequent awakenings		Difficulty in falling asleep again		Frequent nightmares	
	OR	(CI 95)	OR	(CI 95)	OR	(CI 95)	OR	(CI 95)
<i>Sleep disturbance in father (no = 1.0)</i>								
Yes	2.33	(1.77–3.06)	1.86	(1.47–2.35)	1.61	(1.26–2.05)	2.07	(1.46–2.93)
<i>Sleep disturbance in mother (no = 1.0)</i>								
Yes	2.54	(2.08–3.11)	1.74	(1.48–2.05)	1.96	(1.66–2.31)	1.93	(1.48–2.53)
<i>In good health (yes = 1.0)</i>								
No	4.59	(3.52–5.99)	2.94	(2.29–3.77)	2.38	(1.86–3.05)	2.88	(2.06–4.04)
<i>Age (40–44 years = 1.0)</i>								
45–49 years	1.31	(0.94–1.84)	1.41	(1.11–1.80)	1.17	(0.91–1.52)	1.30	(0.83–2.03)
50–54 years	1.68	(1.21–2.33)	1.87	(1.47–2.37)	1.34	(1.04–1.73)	1.47	(0.95–2.29)
55–59 years	2.14	(1.55–2.96)	2.28	(1.79–2.91)	1.84	(1.43–2.36)	1.50	(0.96–2.34)
60–64 years	2.83	(2.05–3.92)	2.50	(1.95–3.22)	2.25	(1.74–2.92)	1.86	(1.19–2.90)

<sup>a</sup> Answer 'no' on the statement 'I have a good sleep'.

examinations [8]. Could the seemingly strong relationship between the sleep behaviour in the group of questioned women and their parents be a recall bias? The women who felt they had sleep complaints might be more likely to report these in their parents.

The logistic regression analyses showed that both frequent awakenings and difficulty in falling asleep after waking were more prevalent in women reporting sleep disturbances in their parents (Table 2). Concordance in difficulties both in falling asleep and in staying asleep have been reported in twins, and this was more common in monozygotic than in dizygotic twins [9].

It was considered of interest to ask about the sleep of the index persons' children, in order to see whether they also were poorer sleepers if their mothers and grandparents had sleep disturbances. The recall bias regarding the offspring (most of whom were still healthy, and some of whom were living at the index person's home) should probably be lower than that regarding the parents (some of whom were disabled or deceased). The results obtained concerning the offspring clearly support a familial aggregation of sleep characteristics.

There are some interesting findings in our study related to gender. Sleep disturbances in the mother were reported four times as often as those in the father. This finding is in accordance with results in other reports [10,11]. Among the women of the present study who slept badly, one-fifth reported

sleep disturbances in the father and half in the mother. In a study by Kahn et al. [12], 23% of boys with poor sleep had fathers with sleep problems. On the other hand, there was no increase in the occurrence of sleep problems in relation to the mothers' sleep, and sleep in the girls was unrelated to that in either of the parents.

A common symptom in sleep disorders is nightmares. The frequency found among this population of women was twice as high in women reporting sleep disturbances in one parent, and three times as high in those who stated that both parents slept badly. A hereditary increase in the occurrence of nightmares has recently been reported in a twin study [2].

In conclusion, the observed familial aggregation of sleep complaints, to our knowledge not previously reported in women, deserves further investigation. The results should be interpreted with caution with regard to the above-mentioned weaknesses of the study. However, the findings point to a possible role of genetics in the overall sleep behaviour.

## References

- [1] Rajput V, Bromley SM. Chronic insomnia: a practical review. *Am Fam Physician* 1999;60:1431–1438.
- [2] Hublin C, Kaprio J, Partinen M, Koskenvuo M. Nightmares: familial aggregation and association with psychiatric disorders in a nationwide twin cohort. *Am J Med Genet* 1999;88:329–336.

- [3] Hublin C, Kaprio J, Partinen M, Heikkila K, et al. Prevalence and genetics of sleepwalking: a population-based twin study. *Neurology* 1997;48:177–181.
- [4] Kaprio J, Hublin C, Partinen M, Heikkila K, et al. Narcolepsy-like symptoms among adult twins. *J Sleep Res* 1996;5:55–60.
- [5] Parkes JD. Genetic factors in human sleep disorders with special reference to Norrie disease. Prader–Willi syndrome and Moebius syndrome. *J Sleep Res* 1999;9(Suppl 1):14–22.
- [6] Heath AC, Eaves LJ, Kirk KM, Martin NG. Effects of lifestyle, personality, symptoms of anxiety and depression, and genetic predisposition on subjective sleep disturbance and sleep pattern. *Twin Res* 1998;1:176–188.
- [7] Morgan K, Healey DW, Healey PJ. Factors influencing persistent subjective insomnia in old age: a follow up study of good and poor sleepers aged 65–74. *Age Aging* 1989;2:117–122.
- [8] Kawada T, Suzuki S, Aoki S, Ogawa. Relationship between subjective sleep rating and objective sleep parameters: a case study. *Environ Res* 1993;60:136–144.
- [9] McCarren M, Goldberg J, Ramakrishnan V, Fabsitz R. Insomnia in Vietnam era veteran twins: influence of genes and combat experience. *Sleep* 1994;17:456–461.
- [10] Asplund R. Are sleep disorders hereditary? A questionnaire survey of elderly persons and their parents. *Arch Gerontol Geriatr* 1995;21:221–231.
- [11] Klink ME, Quan SF, Kaltenborn WT, Lebowitz MD. Risk factors associated with complaints of insomnia in a general adult population. Influence of previous complaints of insomnia. *Arch Int Med* 1992;152:1634–1637.
- [12] Kahn A, Van de Merckt C, Rebuffat E, Mozin MJ, et al. Sleep problems in healthy preadolescents. *Pediatrics* 1989;84:542–546.