Sleep disturbance and correlates in menopausal women in Shanghai

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ABSTRACT

Objective: The aim of this study was to investigate the sleep disturbance and its correlates in Chinese middle-aged women.

Methods: A total of 2046 Chinese women 40–60 years of age were recruited in this cross-sectional descriptive study. The subjects were surveyed using the Pittsburgh Sleep Quality Index (PSQI), the modified Kupperman Index (KI), and a general questionnaire to obtain sociodemographic data. Data were analyzed using SPSS 20.0 software.

Results: In this study, the mean (standard deviation) age of the participants was 51.69 (6.54) years and the mean PSQI score was 6.88 (3.20). The prevalence of sleep disturbance was 33.2% (a PSQI global score ≥8). The prevalence of sleep disturbance was higher in women with a menopausal status (from 34.8% in premenopausal women to 40.9% in postmenopausal women, P < .001) and in women with an increased age (from 21.7% in women 40–44 years of age to 41.8% in women 55–60 years of age, P < .001). Vasomotor symptoms (classical menopausal symptoms, VMS) were associated with sleep disturbance. An increase in the severity of menopausal symptoms (higher total KI scores) was observed in women who experienced sleep disturbance. A logistic regression analysis revealed that menopausal status, vasomotor symptoms, modified KI scores, a history of disease, and older age (≥50 years) were significant risk factors for sleep disturbance.

Conclusions: Sleep disturbance was highly prevalent in this large sample of middle-aged Chinese women. Therefore, clinicians should pay more attention to sleep problems in middle-aged Chinese women and measures should be taken to improve the quality of sleep in these women.

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Introduction

Menopause occurs because of the depletion of ovarian follicles, which indicates the end of fertility. The gradual or sudden cessation of estradiol and progesterone production by the ovaries impacts many tissues, from brain to skin [1]. Women may experience somatic, psychological, and urogenital symptoms. Sleep disturbance is one of the most common symptoms in menopause and mainly includes trouble falling asleep, waking up several times during the night, and waking up earlier than planned and unable to fall asleep again [2]. Women who experience a prolonged period of poor sleep are more susceptible to disease, such as depression, cardiovascular disease, and obesity [3–5]. Therefore, it is important for clinicians to consider sleep disturbance in menopausal women.

Epidemiological studies have found that perimenopausal and postmenopausal women reported significantly more subjective sleep disturbance than premenopausal women [6,7]. The increase in sleep disturbance during the menopausal transition is multi-factorial [8]. Several studies have suggested that age, menopause, menopause-related symptoms, mood problems, depression, and chronic illness are factors associated with sleep disturbance [9–11]. However, Kravitz et al. found that a poor health perception and nervousness were the most significant correlates of sleep disturbance during the menopausal transition [12].

Few epidemiological studies have assessed subjective sleep disturbance in Chinese women during the menopausal transition. Kravitz et al. found that Asian women reported less sleep difficulty than Caucasian women [12]. Therefore, this study aimed to investigate sleep disturbance and its correlates in Chinese middle-aged women. Studies in other countries have found that sleep disturbance is closely associated with vasomotor symptoms (classical menopausal symptoms, VMS) [12,13]. We hypothesized that vasomotor symptoms would be associated with sleep disturbance in Chinese women. The results of this evaluation of sleep disturbance in Chinese middle-aged women will be discussed.

Methods

Subjects and study design

From June 2012 to March 2013, a cross-sectional study was performed at the physical examination center, of the Sixth Affiliated People's Hospital of Shanghai Jiao Tong University, in Shanghai, China.

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Women who visited the physical examination center for a routine check-up were recruited. The inclusion criteria of this study were as follows: (1) 40–60 years of age, (2) no oral contraceptive, or hormone therapy, (3) no history of psychiatric illness, and (4) no history of a surgical operation in the last 6 months. A face-to-face survey was conducted by trained personnel to identify women who met the inclusion criteria. Eligible subjects were asked to fill out the Chinese versions of the Pittsburgh Sleep Quality Index (PSQI), the modified Kupperman Index (KI), and a questionnaire to obtain basic personal data. The women were informed about the purpose and content of the research and were asked to give written informed consent before participating in the study. The research protocol was approved by the ethics review board of the hospital.

Instruments

General questionnaire

A questionnaire was used to obtain personal data, including age, education, occupation, family income, menopausal and marital status, parity, body mass index (BMI), age at menarche and menopause, habits (smoking and drinking), and history of chronic disease. Menopausal status was assessed using self-reported menstrual history. Premenopause was defined as the occurrence of a regular menstrual period within the previous 3 months. Perimenopause was defined as the presence of amenorrhea for at least 3 months but less than 12 months or the onset of irregular menstrual periods in the previous 3 months. Postmenopause was defined as the presence of amenorrhea for at least 12 months or a history of bilateral oophorectomy that was performed 6 or more months before the study [6]. Body mass index (BMI) was calculated as weight in kilograms divided by height in meters squared. The BMI values were categorized as low (<18.50 kg/m^2), normal (18.50–24.99 kg/m^2), overweight (25.00–29.99 kg/m^2), or obese (≥30.00 kg/m^2) [14]. Hypertension was defined as a blood pressure ≥140/90 mm Hg or the use of antihypertensive drugs. Diabetes mellitus was identified by the use of hypoglycemic drugs.

Validated tools

The PSQI is a self-rating instrument that measures subjective sleep quality during the previous month [15]. The PSQI includes 19 items that are used to generate scores based on the following 7 components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medications, and daytime dysfunction. Each item can be scored from 0 to 3. The 7 component scores are summed to produce a global PSQI score, which ranges from 0 to 21. A PSQI global score of 8 or higher was defined as poor sleep quality, and higher scores indicated poorer sleep quality.

The modified KI is widely used to evaluate menopause symptoms in the present, which consists of 13 items [16]. The 13 items included hot flushes/night sweats (as vasomotor symptoms, VMS), paresthesia, dizziness, arthralgia/myalgia, headache, palpitations and formication (categorized as somatic symptoms); insomnia/sleep disturbance, depression, irritability, and fatigue (categorized as psychological symptoms); and urinary infection and sexual complaints categorized as urogenital symptoms. The scores range from 0 to 3 (none, mild, moderate and severe). The weighted score for hot flushes and sweating is 4. Paresthesia, insomnia, irritability, sexual complaints, and urinary infection receive 2 points each. The other symptoms receive 1 point each. The total KI score ranges from 0 to 63, and this score is calculated as the sum of all of the scores for each item. Score ranges of 0–6, 7–15, 16–30, and >30 were used to rate the degree of severity as none, mild, moderate, and severe, respectively.

Statistical analysis

The data analysis was performed using SPSS 20.0 for Windows. Descriptive statistics were used to analyze the demographic data and the independent variables. The descriptive results were expressed as the mean (standard deviations, SD) and the percentage (95% confidence intervals, CI). The comparison of the sociodemographic data, the prevalence of sleep disturbance, the sleep variables, and the menopausal symptoms between the pre-, peri- and postmenopausal women was analyzed using one-way analysis of variance (ANOVA) for the continuous variables and chi-squared test for the categorical variables. Post-hoc analyses were performed when ANOVA revealed significant differences between the women according to menopausal status. A multiple logistic regression analysis was performed for the simultaneous assessment of the different variables that influenced sleep disturbance. For all of the calculations, a *P* value < .05 was considered to be statistically significant.

Results

Participants

During the study period, a total of 2068 women agreed to participate. Overall, 1.1% of the women provided incomplete data; therefore, 2046 subjects were available for the final analysis. The demographic characteristics of the subjects are provided in Table 1. The mean age of the subjects was 51.69 (6.54) years, and the ages ranged from 40 to 60 years. The mean age at natural menopause was 50.57 (3.34) years, and the ages ranged from 35 to 60 years in this study.

Prevalence of sleep disturbance

In this study, the mean PSQI score was 6.88 (3.20). Overall, 33.2% of the subjects reported sleep disturbance. The prevalence of sleep disturbance was higher in women with an increased age and in women with a menopausal status. Indeed, the prevalence of sleep disturbance significantly increased from 21.7% in women 40–44 years of age to 41.8% in women 55–60 years of age, and the difference was statistically significant ($x^2 = 62.36$, P < .01). Similarly, only 24.8% of the premenopausal women reported sleep disturbance, whereas 34.8% of the perimenopausal women and 40.9% of the postmenopausal women reported sleep disturbance ($x^2 = 55.70$, P < .01). A similar increasing trend was observed for parity,

Table 1
General demographic data of participants

Variables	n (%)
Age, years	
40–44	392 (19.2)
45–49	413 (20.2)
50–54	348 (17.0)
55–60	893 (43.6)
Educational years	
<10 (primary school)	183 (8.9)
10–15 (middle school)	863 (42.2)
>15 (university)	1000 (48.9)
Marital status	
Married	2011 (98.3)
Divorced/widowed	31 (1.5)
Single	4 (0.2)
Parity	
0	57 (2.8)
1–2	1898 (92.8)
≥3	91 (4.4)
Income (RMB/per month)	
<3000	741 (36.2)
3000–5000	844 (41.3)
>5000	461 (22.5)
Body mass index, kg/m^2	
Low	65 (3.2)
Normal	1501 (73.4)
Overweight	435 (21.3)
Obese	42 (2.1)
Missing	3 (0.1)
Current smoking	8 (0.39)
Current drinking	24 (1.17)
History of disease	
Obesity	42 (2.1)
Hypertension	603 (29.47)
Diabetes mellitus	86 (4.20)
Menopausal status	
Premenopause	930 (45.5)
Perimenopause	141 (6.9)
Postmenopause	975 (47.7)