

Research Article

## Sleep disturbances in women during menopausal transition and menopause

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### Abstract

**Background:** Sleep disturbances are common in women during menopausal transition and menopause and are characterized by difficulty in falling asleep, staying asleep, problems in waking up and daytime sleepiness. Sleep disturbances occurs despite adequate opportunity for sleep. Vasomotor symptoms like hot flushes, night sweats, fatigue and mood swings also occur along with disruption of sleep architecture.

**Objective:** To assess the sleep pattern in women in menopausal transition and menopause.

**Methods:** A cross-sectional study was done on 270 women who were recruited for the study. They were divided into four groups. A questionnaire based assessment of sleep disturbance was done on these women.

**Result:** Sleep problems were more severe in women in menopausal transition and menopause in comparison to premenopausal women.

**Conclusion:** Fall in estrogen levels leading to vasomotor symptoms in these women which could be the main reason for sleep disturbances.

**Keywords:** Sleep disturbance, Menopausal transition, Menopause, Estrogen

### 1. Introduction

Insomnia is a frequently encountered condition in women during menopausal transition through to menopause when compared to premenopausal period.<sup>1,2</sup> Menopause may be defined as amenorrhea for 12 consecutive months after the last menstrual period in women. The average age of natural menopause remains to be around 51 years.<sup>3</sup> Perimenopause or menopausal transition can begin 8-10 years before menopause and usually starts in early forties and lasts until menopause. Though menstrual cycles continue at this time, many women start experiencing menopausal symptoms. This may be due to gradual decline in the production of estrogen by the ovaries in early stage and this drop in estrogen accelerates in the last 1 or 2 years of perimenopause. Sleep disturbances are common during this time characterized by difficulty in falling asleep, night time awakening, maintaining sleep, problems in waking up and daytime sleepiness.<sup>4,5</sup> Sleep disturbance occurs despite adequate opportunity for sleep.<sup>6</sup> Sleep problems are common during menopause in nearly 25% to 50% of menopausal women and they are 3-4 times more likely to have sleep problems than premenopausal women.<sup>1,2,5,6</sup>

Women also experience vasomotor symptoms like hot flushes, night sweats, fatigue, mood swings, irritability, headache, palpitations along with sleep disorders like disruption of sleep architecture during menopausal transition and early menopause.<sup>1,7</sup> Studies were done previously to know whether sleep disturbances in middle aged women were a consequence of hormonal imbalances due to disruption of hypothalamic-pituitary-ovarian axis or is consequence of morbidities associated with increased age. However, several studies on middle aged women support the hypothesis that sleep disturbances increase as women make the transition into menopause.<sup>8</sup> It is now necessary to address this issue of menopausal symptoms to give a better Quality of Life (QOL) to women as the life expectancy has increased globally as well as in developing countries like India. In recent years, it is seen that a woman spends a reasonable number of years even after menopause, hence, the postmenopausal years become as important as the premenopausal years of life.<sup>9,10</sup>

Very few studies have been conducted to evaluate the sleep pattern in perimenopausal and postmenopausal women. Hence, the present study aims to assess the percentage of women having sleep disorders during menopausal transition and menopause in South India.

### 2. Material and methods

A cross-sectional study was done by recruiting 270 women attending the hospital outpatient departments and was divided into four groups. Group I had 48 subjects who were less than 40 years of age. Group II consisted of 72 women between 41-45 years. Group III had 63 women between the age of 46-50 years and group IV had 87 women who were more than 50 years. In each group, the number of women attained or not attained menopause were tabulated. All the participants were asked to complete a questionnaire consisting of 2 parts. The first part contained information about their age, height, weight and age of attaining menopause. The second part of the questionnaire consisted of 7 questions to assess the symptoms and consequences of insomnia. Questions to know whether it is difficult for them to fall asleep, stay asleep and problems in waking up were included. Information regarding their current sleep pattern, sleep problems interfering with their daily activities and night time awakening were sought. An informed consent was taken from all the participants and the Institute's Ethics Committee permission was obtained.

### 3. Results

Results were analysed and tabulated. Percentages were calculated for various parameters. Table 1 depicts the number in the four groups of participants and their menopausal status. Out of the total 270 participants in the study, none of the group I women had attained

menopause, whereas in group II category 12 women attained menopause and 60 did not. 36 women in group III attained menopause and 27 did not. In group IV, 69 women attained and 18 women did not attain menopause. In these four groups, the sleep pattern was studied.

Table 2 and table 3 show the severity of sleep problems like difficulty in falling asleep, difficulty in staying asleep and problem in waking up among the study participants. The severity was assessed by analysing the response given by the study group. Group I participants had least problems in all the questions asked in this table and group IV had maximum problems. The severity of the sleep problem was increasing from group I to IV.

Table 4 shows to what extent the sleep problems were interfering in social life, whether noticeable to others and interfering with daily activities. Group III and group IV participants were more worried in comparison to group I and II.

Participants were also asked about their worry regarding the current sleep pattern which is depicted in table 5. Though group IV subjects had maximum worry about their current sleep pattern, group I subjects also showed more concern in comparison to group II and III.

Table 6 depicts the frequency of night time awakening which was least (9.52%) in group I subjects and maximum (34.48%) in group IV subjects.

Table 7 depicts anxiety among the subjects associated with darkness. 87.5% of the women in group I did not have significant symptoms, whereas 4.76% participants of group III and 13.79% of subjects in group IV had severe symptoms and even used drugs to get over the anxiety associated with darkness.

**Table 1: Mean age and Age of attainment of menopause of the study participants**

Age (years)	No. of subjects (N=270)	Attained Menopause (N = 117)	Not attained menopause (N=153)
<40 (Group I)	48	0	48
41 – 45 (Group II)	72	12	60
46-50 (Group III)	63	36	27
>50 (Group IV)	87	69	18

**Table 2: Sleep pattern in the 4 groups of participants**

Groups & their responses	Difficulty in falling asleep Percentages (%)				Difficulty in staying asleep Percentages (%)			
	Group I	Group II	Group III	Group IV	Group I	Group II	Group III	Group IV
None	62.5	47.61	37.5	44.83	50	54.16	38.09	44.82
Mild	18.75	28.57	12.5	10.34	31.25	16.66	33.33	13.79
Moderate	18.75	14.28	37.5	20.68	18.75	25	23.8	27.58
Severe	-	9.52	12.5	13.79	-	4.16	4.76	13.79
Very severe	-	-	-	10.34	-	-	-	-

**Table 3: Problem in waking up**

Groups & their responses	Group I (%)	Group II (%)	Group II (%)	Group IV (%)
None	43.75	47.62	37.5	37.93
Mild	25	23.80	33.33	20.68
Moderate	18.75	19.04	20.83	24.13
Severe	12.5	8.33	8.33	17.24
Very severe	-	-	-	-

**Table 4: Sleep problems interfering with social life**

Groups & their responses	Noticeable to others Percentages (%)				Sleep problem interfering in daily activities Percentages (%)			
	Group I	Group II	Group III	Group IV	Group I	Group II	Group III	Group IV
None	56.25	50	47.62	51.72	56.25	41.67	61.90	62.06
Little	18.75	33.33	23.81	20.69	25	37.5	19.04	10.34
Somewhat	25	16.67	19.04	20.69	18.75	12.5	4.76	10.34
Much	-	-	9.52	6.89	-	9.34	14.28	17.24
Very much	-	-	-	-	-	-	-	-

**Table 5: Worried about current sleep pattern**

Groups & their responses	Group I (%)	Group II (%)	Group III (%)	Group IV (%)
None	56.25	41.66	52.38	55.17
Little	25	25	14.28	17.24
Somewhat	12.5	20.16	19.04	13.79
Much	6.25	9	9.52	3.45
Very much	-	4.16	4.76	10.34

**Table 6: Night time awakening**

Response	Group I (%)	Group II (%)	Group III (%)	Group IV (%)
Frequent	9.52	18.75	20.83	34.48
Rare	90.47	81.25	79.16	65.51

**Table 7: Anxiety about darkness**

Responses	Group I (%)	Group II (%)	Group III (%)	Group IV (%)
Not significant	87.5	83.33	66.67	79.31
Significant but not used drugs	12.5	16.66	28.57	6.89
Significant and used drugs	-	-	4.76	13.79

#### 4. Discussion & Conclusion

The severity of sleep problem was more observed in Group III and Group IV women who had difficulty in falling asleep and staying asleep when compared to group I and group II. This may be due to fall in estrogen levels which causes longer sleep latency and shorter REM sleep leading to tiredness after awakening.<sup>11,12</sup> It was also observed that only group IV women had very severe difficulty in falling asleep (10.34%) in comparison to the other three groups who did not have.

Problem in waking up was more prominent in group IV women, probably due to hormonal deficiency. Estrogen has complex effects in CNS with menopausal transition and menopause. Changes in nervous system contribute to dysfunction in numerous brain functions causing sleep disorders, mood changes and even cognitive performances.<sup>13,14,15</sup> Fluctuations in estrogen may also alter ( $\gamma$ -amino butyric acid) GABA function by reducing the number of GABA receptor complexes. Estrogen physiologically has a barbiturate like action on GABA thereby maintaining sleep in premenopausal age. With reduction in estrogen levels during perimenopausal and menopausal periods, GABA activity increases leading to difficulty in initiation and maintenance of sleep.<sup>16</sup> But between group I and groups II and III, the problem of waking up was unexpectedly more severe in group I in comparison to groups II and III which could be due to their lifestyle factors like staying up late by choice or occupation that requires them to meet work or social obligations and may not be due to hormonal deficit in this group.

Sleep problems interfering in social life which the participants thought were noticeable to others and also interfering in their daily activities were more prominent in groups III (14.28%) and IV (17.24%). The severity of the problems in group I and group II were less. Though all 4 groups expressed their worry about the current sleep pattern, it was most evident in group IV (10.34%) who also had severe problems interfering in their social life. This is also attributed to the hormonal imbalance.

The frequency of night time awakening was more (34.48%) in group IV women who did not have sound sleep in comparison to the other 3 groups which is evident from this study and is also in accordance with previous studies.<sup>16,17</sup> This could probably be due to decrease in estrogen levels leading to vasomotor symptoms like hot flushes which have been associated with arousal and disruption of sleep architecture.<sup>5</sup> Anxiety about darkness in the night did not follow a specific pattern as it is more of a subjective feeling of the women. However, few women in group III and group IV were anxious about the darkness and had used drugs. This usage of drugs was more in group IV women (13.79%) in comparison to group III women (4.76%) as the duration and severity of sleep problems were also more in the former group.

It is evident from this study that all aspects of sleep disturbances were more prominent in group IV followed by group III as these women were either in menopausal transition or menopause.

Sleep disorders during menopausal transition and postmenopausal period are common and need careful evaluation to identify the underlying cause as it may be multifactorial. Effective behavioural and pharmacological therapies like hormone replacement therapy may be advised to women to treat sleep disturbances of different etiologies. Overall quality of life of these women may also be improved by appropriate social and emotional support by family members.

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