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Research Article

**PREMENOPAUSAL AND POST MENOPAUSAL IMPACT OF  
SERUM ESTROGEN LEVELS ON FEMALES SLEEP ROUTINE****Dr. Anood Ijaz, Dr. Muhammad Abdul Rehman, Dr. Marjan Haider**  
Services Hospital, Lahore**Abstract:**

**Purpose:** To assess habits of sleep in pre and post-menopausal women and to know the correlation between sleep habits and sex hormones.

**Operational Design:** Cross-sectional study.

**Location and Time:** The study was conducted in Obstetrics and Gynecology department in collaboration with physiology department of Services Hospital, Lahore for the period of one year from June 2015 to June 2016.

**Methods:** Sixty five women were randomly selected, 33 were menopausal (group) and 32 were post-menopausal women (Group B). Sleep habits were evaluated using the questionnaire on sleep habits and blood samples were taken to assess estrogen serum levels and assessed by enzyme linked fluorescence immunoassay (ELFA).

**Results:** Compared to postmenopausal and premenopausal women, sleeping habits and significant statistically outcome proved that postmenopausal women had a low sleep latency ( $p = 0.011$ ) in premenopausal women. Postmenopausal women woke up early in the morning without an alarm ( $p = 0.000$ ), and postmenopausal women woke up early in the morning and before menopausal women when the postmenopausal women were more likely to awaken premenopausal women ( $p < 0.01$ ) earlier witnesses ( $p = 0.000$ ). Estrogen Serum levels were lower in women who are postmenopausal than in premenopausal women ( $p = 0.000$ ).

**Conclusions:** The study showed that serum estrogen levels affect women's sleep patterns throughout the menstrual cycle and menopause.

**Keywords:** Estrogen, Sleeping habits, replacement estrogen therapy, menopause.

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**INTRODUCTION:**

Sleep is indispensable process of biological in nature everywhere; there is little handling of information on sensory and no interconnection with environment or conspecifics because of the newspaper's idle state. It is often said that sleep is ideal for adults and tonics that are considered eight hours of health and well-being. Sleep difficulty is much common in females than in males, and the incidence of this strain become greater with aging. Women 2 to 3 times more middle-aged in Insomnia men 4. Indications that the report is likely to be due to the female predominance of self-reported sleep problems. Alterations in hormone levels during menopause and during the menstrual cycle have been related with differences in the onset of sleep disorders, often in sleep patterns. When a woman reaches the age of 40; Your ovaries start closing, producing less estrogen. Estrogen progressive decline causes various changes in tissues such as vulva, vagina, bladder, uterus, breast, urethra, heart, bone, brain, blood vessels, skin, estrogen response, mucous membranes and hair. Estrogen deficiency for a long time even more a woman of osteoporosis and a variety of heart disease and other symptoms such as insomnia, hot flashes, nervousness, mood, concentration or memory impairment, depression and fatigue. variations in hormones including the menstrual cycle in normal affect sleep. The longest onset of sleep delay (SOD) and sleep poor quality occur in the luteal late phase. The area, estrogen, sleep initiation delay (LE) is reduced to reduce the number of wake after sleep, prolong the total sleep duration and reduce the number of spontaneous cyclic stimulation. In mammals, estrogen is a thermostating hormone that helps to regulate the duration of low body temperature overnight. In premenopausal women, during the luteal phase (low estrogen level), there is an increase in the number of stimuli twice.

**METHODOLOGY:**

The study was conducted at the Obstetrics and Gynecology department of Services Hospital, Lahore for the period of one year from June 2015 to June 2016 in collaboration with Physiology department. The study was a cross-sectional randomized study in which 2 female groups were evaluated according to sleeping habits and serum estrogen levels. Sixty female volunteers ( $n = 60$ ) were included in the study. Subjects were divided into two groups (A and B). There were 30 people in each group. Group A; A total of thirty women were included ( $n_1$ ). All cases were normal menarche onset, well-developed secondary sexual characteristics, premenopausal women between 18-24 years of age with regular

menstrual cycles. Group B had 30 postmenopausal women between 40 and 65 years of age. Natural menopause was onset, there was no postmenopausal bleeding, and apparently they were healthy. According to the serum estrogen levels, these 60 women were divided into four categories. Category 1 includes women with serum estrogen levels less than 30 pg / ml, which coincides with postmenopausal status. Category 2 includes women with serum estrogen levels greater than 30 pg / ml and less than 100 pg / ml, and these levels overlap with those in the early follicular phase. Women with serum estrogen levels between 100 pg / ml and 200 pg / ml were included in category 3, and these levels corresponded to the follicular phase. Females whose serum estrogen levels were higher than 200 pg / ml were included in category 4, and these levels corresponded to the pre-spawning phase. Patients receiving sedative, anxiolytic, antidepressant, anticonvulsant, steroid or hormone replacement therapy were not included in the study. In addition, patients with irregular menstrual cycles, polycystic ovarian disease, or any other recent surgery were also excluded from the study. Serum estrogen levels of all women were measured to assess women's pre- and postmenopausal variations. The written permission has been obtained from the participants. The sleep questionnaire was filled with discussion. The questionnaire consists of two parts. The first section contains demographic details. The second part consisted of 29 questions, which were the sleep time, the duration of waking, the duration of sleep, the way of waking, the number of night waking, the memory of dreams, and the frequency of sleep. and morning and evening fatigue. Blood sampling was done with phlebotomy. All samples were taken between 8:00 am to standardize sampling techniques. and 9:00 in the morning after breakfast. All subjects' pulse, temperature and blood pressure were recorded during sampling. Menopausal women were asked about the date of the last menstrual period (LMP) to know the phase of the menstrual cycle. The samples were sent to the laboratory for evaluation of serum estrogen levels by enzyme linked fluorescence immunoassay (ELFA) performed on a coded and automated VIDAS instrument. Data were assessed with SPSS 17 and compared between sleeping habits and serum comparison. Estrogen levels were assessed in premenopausal and postmenopausal women by using variance analysis (ANOVA). Smaller values of  $p < 0.05$  were considered significant. Sleep habits of the two groups were analyzed using Student's t-test. Analysis of more than one group was performed using ANOVA. Mean, standard error of F and p values was assessed by Bonferroni use. The

percentage and the number of women were determined by the use of cross eyelashes.

### RESULTS:

Table I shows the comparison of sleeping habits between two groups of women. Women's sleeping habits were compared in two groups, assessing nighttime sleeping times, nightly sleep-wake counts, total hours of sleep at night, and wake-up times in the morning. The comparison of the number of wake-ups between the two groups is statistically significant at 0.000 p-value, indicating that post-menopausal

women have more nightly awakening than premenopausal women. Comparisons of total sleep duration were also statistically significant ( $p = 0.011$ ), indicating that sleep duration was different in premenopausal women and that sleep duration in postmenopausal women was lower than in women. premenopausal The mean time of awakening in the morning of N1 was  $6.32 \pm 0.07$  and the value of n2 was  $5.11 \pm 0.21$  p. A statistically significant value of 0.000 indicates that postmenopausal women awaken earlier than menopausal women in the early morning.

TABLE - I: COMPARISON BETWEEN PREMENOPAUSAL AND POSTMENOPAUSAL FEMALES ON THE BASIS OF THEIR SLEEP HABITS (n= 60)

Groups	Time to go to bed $\pm$ SEM	Number of awakenings per night $\pm$ SEM	Duration of sleep in hours $\pm$ SEM	Time of rise in morning $\pm$ SEM
Premenopausal females (n=30)	10.26 $\pm$ 0.56	1.4 $\pm$ 0.10	6.66 $\pm$ 0.18	6.21 $\pm$ 0.06
Postmenopausal females (n=30)	9.58 $\pm$ 0.59	2.7 $\pm$ 0.11	5.93 $\pm$ 0.21	5.09 $\pm$ 0.21
p value	0.413*	0.000****	0.011***	0.000****

Table II shows that serum estrogen levels in women in the study sample correlate with sleeping times (a), sleep duration (b) and waking time. morning (c). Women were divided into four categories according to serum estrogen levels. Category 1 includes women with serum estrogen levels less than 30 pg / ml, which coincides with postmenopausal status. Category 2 includes women with serum estrogen levels greater than 30 pg / ml and less than 100 pg / ml, and these levels overlap with those in the early follicular phase. In category 1, there were 32 women

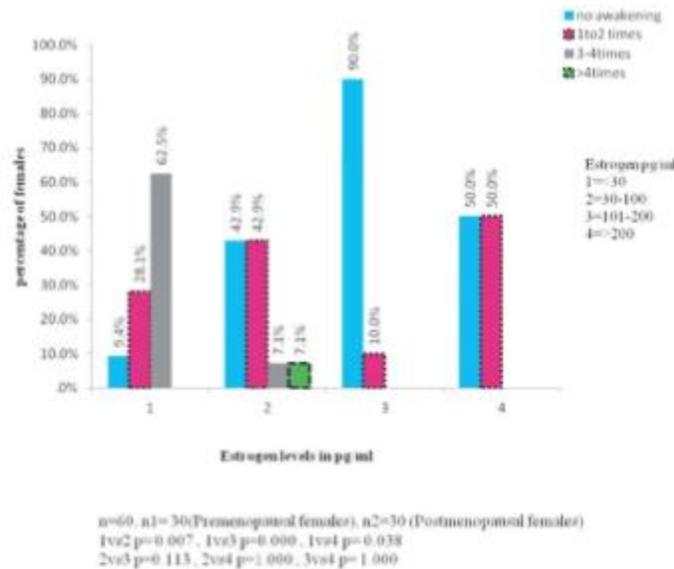
with 30 postmenopausal and 2 premenopausal women. 14 women in the category 2 category, 10 women in the category 3, 4 women in the 4 categories and all were menopausal. It's time to go to bed and sleep. The Post Hoc test was performed for the wake-up time in the morning and the p-value was found to be significant for group 1 versus 3 versus 3 for group 1, but this was not significant for the rest of the groups. women in category 1 woke up before the women in the rest of the categories.

TABLE - II: RELATIONSHIP OF SERUM ESTROGEN LEVELS WITH SLEEP HABITS OF FEMALES (n= 60)

Estrogen categories	Number of females	Time to go to Bed (a)	Sleep duration in hrs (b)	Time to Wake up (c)	p value of Groups	pa	pb	Pc
1	32	9.82 $\pm$ 0.57	5.97 $\pm$ 0.19	5.21 $\pm$ 0.19	1 vs 2	1.000*	0.668*	0.016**
					1 vs 3	1.000*	0.546*	0.017**
2	14	10.58 $\pm$ 0.74	6.54 $\pm$ 0.26	6.12 $\pm$ 0.18	2 vs 3	1.000*	1.000*	1.000*
					2 vs 4	1.000*	1.000*	1.000*
3	10	8.96 $\pm$ 1.27	6.65 $\pm$ 0.36	6.24 $\pm$ 0.16	3 vs 4	1.000*	1.000*	1.000*
4	04	10.82 $\pm$ 0.49	7.25 $\pm$ 0.59	6.15 $\pm$ 0.08	1 vs 4	1.000*	0.188*	0.333*

\*p>0.05 (Non Significant), \*\*p<0.01

Figure -1 The ratio of estrogen levels per night to serum estrogen levels in women included in the study. While the percentage of teeth is plotted against the Y axis, it represents serum estrogen levels on the x-axis milliliter (pg / ml) blood markers.



**Figure-1: Comparison between Estrogen levels and number of awakenings per night in females**

### DISCUSSION:

In this pilot study, community based cross-sectional sleep disturbances and estrogen serum levels were assessed in pre- and post-menopausal women. The relationship between estrogen levels and women's sleeping habits was also assessed. Sleep difficulty is more common in women than in men, and this difficulty increases as women approach menopause. The data obtained from the NIH State-of-the-Science Conference on the treatment of symptoms related to menopause indicated that sleep problems were reported by 16-42% of premenopausal women and 39-47% among 35-60% of postmenopausal women. During the assessment of women's sleeping habits before and after menopause, it was found that there was a significant difference over time for women to go to bed at night between two groups. Postmenopausal women's waking hours in the morning were earlier than menopausal women, i.e., 5.11 a.m. postmenopausal women and 6.32. for premenopausal women. These results were obtained from Chol Shin et al. Middle-aged Korean women showing that early morning awakening is more common in postmenopausal women than in pre- and perimenopausal women. Postmenopausal women were found to have a significantly higher number of nightly awakenings than premenopausal women. This finding, Howard M. et al. worse sleep care and more widespread night wakes are among the 18 most common postmenopausal women during menopause transition women's day. Antonijevic IA et al. pre- and post-menopausal women, similar findings were

observed in 21 cases of REM sleep and reduction in frequency of REM sleep and reduction, but not in pre-menopausal women. In another study of women with post-menopausal women with irony RW in 2000, estrogen replacement showed that these women caused hot-press 22 and decreased frequency, resulting in better sleep quality.

In the study, serum levels of estrogen in women were also found to have affected their sleeping habits. the number of wake-ups in the morning and the number of nights in the morning before the total sleeping period, the serum estrogen level is lower. These findings indicate that treatment of postmenopausal women with replacement therapy estrogen (ERT) has reduced the frequency of treatment REM sleep, night waking and healing. Shechter et al. it has been shown that during the different phases of the menstrual cycle women's menstrual habits decrease the frequency of REM sleep compared to the average follicular phase in the menstrual cycle at a high level of estrogen in the mean leuteal phase of menstrual cycle. Women's memory was also compared with estrogen serum levels with dreams and dreams that memory was with lower estrogen levels.

### CONCLUSION:

This study demonstrates that serum estrogen levels affect women's sleep patterns during menstrual cycle and menopause. As serum estrogen levels decrease after menopause; Women's sleeping habits are affected. The study suggested that postmenopausal

women had more nightly awakening, early morning sleep, more fatigue at night, shorter sleep times, and more imagination. Estrogen levels in serum are also related to sleep quality. The better the estrogen levels are, better sleep quality.

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