Original Article

Evaluation of Sleep Problems in Preeclamptic, Healthy Pregnant and Non-Pregnant Women

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Objective: Sleep problems are common complaints among pregnant women. This study was designed to compare subjective sleep problems in non-pregnancy condition, healthy and preeclamptic pregnancy as a major complication of pregnancy. We hypothesized that some sleep problems are more prevalent in females with preeclampsia.
Methods: In this cross-sectional study, 102 women with preeclampsia, 106 healthy pregnant women in the third trimester and 103 healthy non-pregnant women were selected through random sampling. Age and parity were matched in the three groups. We used Global sleep assessment questionnaire (GSAQ) to check the subjective sleep problems, and then we performed statistical analysis using Analysis of variance (ANOVA) and Pearson Chi-square tests.
Results: Our findings revealed significant differences in initial insomnia ($p = 0.034$), fragmented sleep ($p = 0.022$), snoring ($p<0.001$), non-idiopathic insomnia ($p = 0.045$) and sadness and anxiety ($p = 0.001$) between the three groups. Some sleep problems were more common in preeclampctic compared to healthy pregnant women including initial insomnia, fragmented sleep, snoring, sleep apnea and non-idiopathic insomnia. Moreover, the subjects with preeclampsia revealed more fragmented sleep, snoring, sadness and anxiety and lack of getting enough sleep due to other activities compared to non-pregnant women.
Conclusion: Different kinds of sleep problems can occur in subjects with preeclampsia in comparison with the non-pregnant and healthy pregnant subjects. Sleep problems should be evaluated during pregnancy, particularly in pregnant women with preeclampsia, and suitable treatment should be provided for any specific sleep problem.

Key words: *Preeclampsia, pregnancy, sleep problems, Global sleep assessment questionnaire (GSAQ).*

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Sleep disorders are one of the most important problems in human medical care. Sleep disorders are typically classified as disturbed sleep quality, poor sleep continuity, short or long sleep duration, restless legs syndrome and sleep breathing disorder (1). Sleep disturbances such as insomnia, increase in total sleep time and decrease in sleep quality are common in pregnancy and are sometimes associated with poor health outcomes due to the biological and hormonal changes during pregnancy that may affect sleep/wake cycle (2, 3). Up to 75% of women experience different types of sleep disruptions during pregnancy (1).

A common complication of pregnancy is preeclamcia (4, 5). Preeclamcia is one of the most important causes of fetal and maternal morbidity and mortality (6-8). To our knowledge, little is known about the evaluation of sleep problems during pregnancy and preeclampsia in Iranian population. This study was designed to compare the prevalence of subjective sleep problems in non-pregnant, healthy pregnant and preeclamptic women in Kermanshah, Iran.

Material and Methods

This cross sectional study was conducted between October 2008 and February 2010 in Kermanshah

University of Medical Sciences (KUMS) after obtaining the approval of the ethics committee Institution of KUMS. We recruited a total number of 311 subjects. One hundred and two women with preeclampsia, 106 healthy pregnant women in the third trimester (29-40 weeks) and 103 healthy non-pregnant women were enrolled in this study. The subjects were recruited through random sampling from obstetrics and gynecology clinics (Imam Reza and Motazedi hospitals) of KUMS. Preeclampsia was defined by having a blood pressure (BP) > 140/90 mmHg after the 20th week of pregnancy with excess protein in the urine (>300 mg in 24 hours) or 30 mg persistent proteinuria (+1 in dipsticks) in random samples (7,8). Exclusion criteria were as follows: previous or current psychiatric or somatic disorder, recent consumption of psychoactive, sedative or narcotic medications, alcohol consumption, substance and opium dependency and overuse of caffeine (more than 8 cups of coffee or 16 cups of tea per day). We also excluded women with severe preeclampsia and eclampcia. Subjective sleep problems were evaluated using Global Sleep Assessment Questionnaire (GSAQ). GSAQ is a simple, cultural free, reliable and valid tool for screening the potential sleep problems. This questionnaire has several questions and the answers are never, sometimes, usually and always. Roth and colleagues designed GSAQ to have a reliable and valid screening tool to distinguish between the sleep disorders (9). The GSAQ was adapted to Persian by a standard translation-back-translation procedure in our previous study (10). In this questionnaire, choosing "usually" and "always" was considered as a problem and choosing "never" and "sometimes" was considered as a normal condition. After a brief explanation about the study goals, all the subjects provided informed consent and filled out the questionnaire carefully. Data were analyzed by ANOVA to assess the differences between the demographic characteristics between the groups, and Pearson Chi-square tests were used to assess sleep problems between the groups using SPSS 16.0 software. P value of less than 0.05 was considered significant.

Result

Demographic characteristics of the participants including maternal age (years) [non- pregnant (29.3 ± 5.9), healthy pregnant (25.3 ± 5.5), preeclamptic (29.35 ± 6.9)], parity [non- pregnant (1.4 ± 1.02), healthy pregnant (1.36 ± 1.12), preeclamptic(1.62 ± 1.54)], gravidity [non- pregnant (1.47 ± 1.03), healthy pregnant (1.82 ± 1.08), preeclamptic(2.24 ± 1.54)], gestational age (weeks) [healthy pregnant (36.93 ± 1.99), preeclamptic (35.44 ± 2.56)] were matched between all the groups.

The subjective sleep problems based on GSAQ are demonstrated in Table 1. Initial insomnia was significantly different between the groups; it occurred in 21.4% of the non-pregnant, 12.3% of the healthy pregnant and 26.5% of the preeclamptic subjects (p = 0.034). Additionally, significant differences were observed in fragmented sleep (p = 0.022), snoring (p<0.001), non-idiopathic insomnia (p = 0.045) and sadness and anxiety (p = 0.001) between the three groups (Table 1). Comparing non-pregnant and healthy pregnant subjects, we found significant differences in snoring (p = 0.027) and sadness and anxiety (p< 0.001). Statistical evaluation between the healthy pregnant and preeclamptic subjects showed significant differences in initial insomnia (p = 0.009),

Table 1: Prevalence of sleep problems in three groups

Variables	Non-pregnant	Healthy pregnant	Preeclamptic	p-value between 3 groups	Non-pregnant vs. Healthy pregnant	Healthy pregnant vs. Preeclamptic	Non-pregnant vs. Preeclamptic
Initial insomnia	22 (21.4%)	13 (12.3%)	27 (26.5%)	0.034*	0.078	0.009*	0.391
Fragmented sleep	17 (16.5%)	15 (14.2%)	29 (28.4%)	0.022*	0.637	0.012*	0.041*
Snoring	7 (6.8%)	1 (0.9%)	22 (21.6%)	<0.001*	0.027*	<0.001*	0.002*
Sleep apnea	3 (2.9%)	2 (1.9%)	8 (7.8%)	0.073	0.628	0.045*	0.117
Non- idiopathic insomnia	15 (14.6%)	13 (12.3%)	25 (24.5%)	0.045*	0.626	0.022*	0.072
Sadness & anxiety	42 (40.8%)	20 (18.9%)	20 (19.6%)	0.001*	<0.001*	0.892	0.001*
Morning fatigue	37 (35.9%)	28 (26.4%)	30 (29.4%)	0.314	0.138	0.630	0.320
daytime sleepiness	37 (35.9%)	35 (33.0%)	33 (32.4%)	0.847	0.659	0.918	0.590
dysfunction in daily activity	13 (12.6%)	11 (10.4%)	18 (17.6%)	0.293	0.611	0.130	0.315
Prevention of getting enough sleep due to other activities	6 (5.8%)	11 (10.4%)	16 (15.7%)	0.072	0.229	0.225	0.023*
Restless leg syndrom	16 (15.5%)	14 (13.2%)	11 (10.8%)	0.603	0.632	0.591	0.315
Periodic limb movement	9 (8.7%)	8 (7.5%)	9 (8.8%)	0.933	0.753	0.737	0.983
nightmare	12 (11.7%)	6 (5.7%)	7 (6.9%)	0.244	0.123	0.720	0.237
Sleepwalking & anxiety	2 (1.9%)	3 (2.8%)	0 (0.0%)	-	0.674	-	-

* Significant difference (P<0.05)

Fragmented sleep (p = 0.012), snoring (p<0.001), sleep apnea (p = 0.045), non-idiopathic insomnia (p = 0.022). Furthermore, non-pregnant and preeclampsia groups were different in fragmented sleep (P = 0.041), snoring (P = 0.002), sadness and anxiety (P = 0.001) and also their activities could prevent them from getting enough sleep (P = 0.023). On the other hand, no significant differences were found between the groups in terms of feeling tired, daytime sleepiness, dysfunction in daily activities, periodic limb movement, restlessness in legs and nightmares.

Discussion

Sleep disturbances are common during pregnancy (4). A significant increase in total sleep time and a decrease in sleep quality has been reported in pregnancy (2). Poor sleep quality is associated with an increased risk of depression and anxiety (11-13). In our study, breathing disorder such as sleep apnea during sleep was more common in pregnancy, particularly among females with preeclampsia. The present data indicate that snoring during sleep is common among females with preeclampsia in contrast to the females with normal pregnancy and the non-pregnant subjects. Previous studies have indicated that snoring contributes to the development of preeclampsia (14, 15). Lee and Caughey suggested that females with snoring are at the risk of developing preeclampsia (3). Edwards and colleagues reported that preeclamptic women had significantly altered sleep architecture (16). Sleep apnea is a common condition that may have major adverse consequences for women in their childbearing years and it sometimes remains unrecognized and untreated. The reports of clinically significant maternal sleep apnea suggested an association with hypertensive disorders in pregnancy (17, 18). Our findings show a higher rate of sleep apnea in preeclamptic and pregnant females, but it is not statically significant. Lee and Caughey assessed insomnia in pregnancy and concluded that the hypoxia associated with OSA may contribute to maternal hypertension (3).

We have already reported that the prevalence of symptoms and the risk of OSA and its associated factors are noticeable and that snoring rate has a higher frequency among women in the city of Kermanshah (19). Other literature suggested that the prevalence of sleep apnea is likely low among healthy women with normotensive and low-risk pregnancies. In contrast, the prevalence of sleep apnea will vary among the women with hypertensive disorders of pregnancy, with measurement as it is described in the non-pregnant population (17, 18). Chronic hypertensive women should be strongly considered for diagnosis and treatment of sleep problems, particularly sleep apnea so that their blood pressure could be controlled. Increasing awareness of sleep apnea among maternal health care providers seems very important in women primary care; it has potential benefits for pregnancy and other health-related outcomes associated with identification and treatment of sleep apnea (17). Our findings also revealed higher fragmented sleep in women with preeclampsia in comparison to the other two groups. Previously, it has been shown that fragmented maternal sleep is strongly correlated with depressive symptoms at three months postpartum (20, 21). Hence, mothers with complaints of difficulty in falling asleep at bedtime should also be evaluated more precisely for postpartum depression .

Conclusion

This study suggested that differnt types of sleep problems can occur in pregnancy particularly in the subjects with preeclampsia. Therefore, we suggest that sleep disorders should be carefully evaluated in preeclampsia and even normal pregnancy in primary clinical care. Further researches with more participants using different screening questionnairs as well as objective methods such as actigraphy (22, 23) can provide a better view on this field for clinicians.

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