

Original Article / Araştırma Makalesi

**EFFECTS OF RESTLESS LEG SYNDROME ON THE QUALITY OF LIFE AND
SLEEP DURING PREGNANCY: A CASE-CONTROL STUDY**

**Huzursuz Bacak Sendromunun Gebelikteki Yaşam Kalitesi ve Uyku Üzerine Etkisi:
Vaka-Kontrol Çalışması**

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ABSTRACT

The study was conducted to examine the effect of restless legs syndrome (RLS) on sleep and quality of life during pregnancy. The study was conducted as a cross-sectional and case-control study with a total of 76 pregnant women, 38 with RLS during pregnancy and 38 without RLS during pregnancy. Research data were collected using; the Restless Leg Syndrome Diagnostic Criteria Questionnaire, Individual Description Form, Pittsburgh Sleep Quality Index and Quality of Life Scale. Obtained data were evaluated using chi-square and t test. Groups were found to be similar in terms of socio-demographic and obstetric characteristics. Statistically significant difference was found between the case and control groups in terms of Pittsburgh Sleep Quality Index subscale and total scale (case group: 10.15 ± 3.51 , control group: 5.12 ± 3.21); the case group was determined to have worse sleep quality than the control group. In addition, the mean scores of the quality of life scale sub-dimensions of the pregnant women in the case group were found to be statistically significantly lower than the control group. In this study, it was concluded that both the sleep and the quality of life levels of pregnant women with RLS were lower than those without RLS.

Keywords: Life Quality, Pregnancy, Restless Legs Syndrome, Sleep Quality

ÖZ

Araştırma, huzursuz bacak sendromunun (HBS) gebelikteki uyku ve yaşam kalitesine etkisini incelemek için yapıldı. 38'i gebelikte HBS olan ve 38'i gebelikte HBS olmayan olmak üzere toplam 76 gebe ile yürütülen araştırma, kesitsel ve vaka-kontrol çalışması olarak düzenlendi. Araştırma verileri; Huzursuz Bacak Sendromu Tanı Kriterleri Anketi, Birey Tanıtım Formu, Pittsburgh Uyku Kalitesi İndeksi ve Yaşam Kalitesi Ölçeği ile toplandı. Elde edilen veriler, ki-kare ve t testi ile değerlendirildi. Gruplar sosyo-demografik ve obstetrik özellikler bakımından benzer bulundu. Araştırmada Pittsburgh Uyku Kalitesi İndeksi alt ölçek ve toplam ölçek (vaka grubu: 10.15 ± 3.51 , kontrol grubu: 5.12 ± 3.21) puan ortalamaları bakımından vaka ve kontrol grupları arasında istatistiksel açıdan anlamlı fark bulundu; vaka grubunun uyku kalitesinin kontrol grubuna oranla daha kötü olduğu saptandı. Ayrıca vaka grubunda yer alan gebelerin yaşam kalitesi ölçeği alt boyutları puan ortalamaları kontrol grubuna göre istatistiksel olarak anlamlı derecede düşük olarak bulundu. Bu çalışmada, HBS olan gebelerin uyku ve yaşam kalite düzeylerinin HBS olmayan gebelere göre daha düşük olduğu sonucuna ulaşıldı.

Anahtar kelimeler: Gebelik, Huzursuz Bacak Sendromu, Uyku Kalitesi, Yaşam Kalitesi

INTRODUCTION

Restless legs syndrome (RLS) is a disorder characterized by a strong, involuntary drive for moving legs mostly during night sleep or resting. It was first described by Thomas Willis in patients with *anxietas tibiaram* who were complaining about sleeplessness and restlessness in the legs in 1685. Later in 1945, Dr. Karl-Axem Ekbom utilized the terms “irritable legs” and “restless legs”, and the disease was named as Ekbom syndrome. RLS is progressive, recurrent and its prevalence increases with age. It mostly appears in legs and rarely arises in arms. It is bilateral and symmetric, mostly emerges at night, aggravates during long-term inactivity and improves with activity. The etiopathogenesis of the disease has not been clearly revealed yet (Şahin et al., 2007).

Pregnancy has been reported to be a risk factor of onset and aggravation of symptoms of RLS. It is thought to appear due to pregnancy related; hormonal factors (prolactin, progesterone, estrogens), psychomotor/behavioral factors, motor changes, changes in sleeping habits, anxiety and metabolic factors (decreased folate and iron levels) (Şahin et al., 2007). Studies from Turkey have revealed that the incidence of the syndrome during pregnancy varies between 15% and 46% (Akbaş & Sözbir, 2019; Çakmak, Metin, Karata, Özsoy, & Demirtürk, 2014; Şahin et al., 2007; Tunç, Karadağ, Doğulu, & İnan, 2007). Several studies have shown that RLS during pregnancy has a negative effect on the sleep quality of pregnant women (Akbaş & Sözbir, 2019; Liu et al., 2016). Sleep disorders experienced during pregnancy may lead to obstetric disorders, early birth, low birth weight, early membrane rupture and higher rates of cesarean section (Chang, Pien, Duntley, & Macones, 2010; Ertekin et al., 2014). In addition to these negative effects, the syndrome is reported to considerably decrease the life quality in pregnant women (Akbaş & Sözbir, 2019 & Liu et al., 2016). The life quality is an individual wellbeing and refers to a subjective satisfaction in many aspects of life. In a normal pregnancy, the life quality can be affected by hormonal, physiological and mental changes (Özhüner & Çelik, 2019). When RLS-related sleep disturbances supervene, there can be a considerable decrease in the life quality of pregnant women. The low life quality in pregnant women can negatively affect both mothers’ and infants’ health. For these reasons, it is significant to examine the effects of RLS on the quality of life and sleep during pregnancy. There have been few studies evaluating the sleep quality (Dunietz et al., 2017; Panvatvanich & Lolekha, 2019; Suzuki et al., 2003) and the life quality in pregnant women with RLS (Akbaş & Sözbir, 2019; S. Telarovic, Condic, & I. Telarovic, 2017). Therefore, this study was performed to examine the effects of this syndrome on the quality of life and sleep in pregnancy.

Answers to the following research questions were sought in this study:

- (1) Is there a difference in the sleep quality between pregnant women with or without RLS?
- (2) Is there a difference in the life quality between pregnant women with or without RLS?

MATERIAL AND METHOD

Design and Sample

This cross-sectional, case-control research was carried out with 76 pregnant women in the obstetrics outpatient clinics of a state hospital in the west part of Turkey, between August and September 2020. Out of 76 women, 38 with RLS formed the case group and 38 women without this syndrome formed the control group. By using the mean scores for physical functioning subscale of the Short Form Health Survey in the study titled “Restless Legs Syndrome and Quality of Life in Pregnant Women” by Akbaş and Sözbir (Akbaş & Sözbir, 2019), the sample size was found to be 72 based on the effect size of $d=0.67$, $\alpha=0.05$ and the confidence interval of 95% to achieve the study power of 80%. Out of 72 pregnant women, 36 with RLS were planned to be in the case group and 36 without this syndrome were planned to be in the control group. The pregnant women aged 20-37 years, experiencing the third trimester of their pregnancy and willing to participate in the research were included while those with pregnancy-related complications and neurological diseases were excluded.

Data Collection and Data Collection Tools

The criteria of the International Restless Legs Syndrome Study Group (IRLSSG) were utilized to determine the presence of RLS, the Pittsburgh Sleep Quality Index (PSQI) was used to define the sleep quality and the 36-Item Short Form Health Survey (SF-36) was applied to reveal the life quality. In addition, a general characteristics form was used to determine sociodemographic and obstetric features of the pregnant women.

Criteria of the International Restless Legs Syndrome Study Group: The criteria of IRLSSG criteria are based on four questions. Individuals giving the response “yes” to all the questions are diagnosed as RLS (Çakmak et al., 2014; Gökçal, Tamer, & Kiremitçi, 2015; Şahin et al., 2007).

General Characteristics Form: The general characteristics form is composed of 11 questions about age, education, employment, income, family structure, age and education of spouses, parity and the number of live births and spontaneous or induced abortions (Akbaş & Sözbir, 2019; Şahin et al., 2007).

The Pittsburgh Sleep Quality Index: The index is a self-report test developed by Buysse et al. in 1989 to obtain information about the sleep quality, and type and severity of sleep disorders in the previous one month (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). Its' validity and reliability for the Turkish version was tested by Ağargün et al. (Ağargün, Kara, & Anlar, 1996). Cronbach's alpha for the test was reported to be 0.804. It is composed of 24 questions, of which 19 were based on self-reports of participants and five are answered by spouses or roommates of participants. Nineteen questions, tabulated in the scoring of the PSQI, are directed towards assessing seven factors; i.e. subjective sleep latency, sleep quality, habitual sleep efficiency, sleep duration, sleep disturbances, sleeping pills usage and daytime dysfunction. Each is scored on a 0-3 scale. Scores for these seven factors are added to obtain a total score for the index which ranges from 0-21. The cut-off value for the PSQI is 5. The score 5 or higher scores, and a severe difficulty in at least two components of sleep or mild or moderate difficulty in more than three components of sleep, indicate a low quality of sleep (Akbaş & Sözbir, 2019; Öztürk, Yılmaz, Müsüroğlu, Sevinç, & Akcan, 2019).

The 36-Item Short Form Health Survey: SF-36 was developed by Ware and Sherbourne (Ware & Sherbourne, 1992), and its validity and reliability for the Turkish version was tested by Pınar (Pınar, 1995). The survey is composed of 36 items and eight subscales; i.e. physical and social functioning, mental health, vitality, role-physical, role-emotional, pain and general health. Scores for each subscale range from zero to 100 and the score zero indicates a poor quality of life and the score 100 indicate a high quality of life (Özhüner & Çelik, 2019).

Data Analysis

Obtained data were analyzed with the Statistical Program for Social Sciences 18 (PASW Inc., Chicago. IL.USA). The normality of the data was controlled with Kolmogorov-Smirnov and Shapiro-Wilk tests. Homogeneity of the variances of the groups was checked with Levene's test. Socio-demographic and obstetric features of the case and control groups were compared by using a Chi-square test, and the scores for the PSQI and SF-35 were compared with a t-test.

Ethical Considerations

Written permission was taken from the hospital where the study was conducted, and the research protocol was approved by the ethical board of clinical research at Health Sciences Faculty of Aydın Adnan Menderes University (Date and number: 05/10/2020-E.51862). The study was managed in accordance with the principles of Helsinki Declaration and research ethics. The pregnant women included in the research were offered information about the

research and their oral informed consent was obtained. They were informed that they could leave the study when they wanted.

RESULTS

Sociodemographic and obstetric features of the women are presented in Table 1. The case and control groups were compared in terms of the sociodemographic and obstetric features including; age, education, employment, income, type of family, age and education of spouses, parity and the number of live births, spontaneous abortions and induced abortions. The comparison showed that the groups were similar in their sociodemographic and obstetric features.

Table 1. Sociodemographic and Obstetric Features of the Women

| Features | Case Group (n=38) | Control Group (n=38) | P |
|---|-------------------|----------------------|-------|
| Education, n (%) | | | |
| Primary education | 23 (60.5) | 22 (57.8) | 0.342 |
| High school | 8 (21.1) | 8 (21.1) | |
| University and higher level of education | 7 (18.4) | 8 (21.1) | |
| Employment, n (%) | | | |
| Employed | 8 (21.1) | 9 (23.7) | 0.658 |
| Housewife | 30 (78.9) | 29 (76.3) | |
| Income, n (%) | | | |
| High | 7 (18.4) | 7 (18.4) | 0.412 |
| Moderate | 22 (57.8) | 21 (55.3) | |
| Low | 9 (23.8) | 10 (26.3) | |
| Type of family, n (%) | | | |
| Nuclear family | 25 (65.8) | 26 (68.4) | 0.741 |
| Extended family | 13 (34.2) | 12 (31.6) | |
| Education of spouses, n (%) | | | |
| Primary education | 21 (55.2) | 22 (57.8) | 0.452 |
| High school | 9 (23.7) | 8 (21.1) | |
| University and higher level of education | 8 (21.1) | 8 (21.1) | |
| Age, Mean± SD | 27.1±5.4 | 26.3±4.3 | 0.315 |
| Age of spouses, Mean ± SD | 31.4±6.2 | 32.8±5.1 | 0.365 |
| Parity, Mean ± SD | 2.6±1.8 | 2.6±1.4 | 0.705 |
| Number of live births, Mean ± SD | 1.0±0.7 | 1.1±1.3 | 0.752 |
| Number of spontaneous abortions, Mean ± SD | 0.4±0.6 | 0.4±0.5 | 0.623 |
| Number of induced abortions, Mean ± SD | 0.1±0.2 | 0.1±0.3 | 0.521 |

Table 2 shows the distribution of the mean scores for the PSQI. As shown in the table, both the case and control groups had a poor sleep quality (the total PSQI score of >5). However, there was a significant difference in the scores for the PSQI and its subscales between the case (10.15±3.51) and control groups (5.12±3.21), and the case group had a lower sleep quality (p<0.001).

Table 2. The Distribution of the Mean Scores for the PSQI and its Subscales

| PSQI | Case Group (n=38) Mean ± SD | Control Group (n=38) Mean ± SD | P |
|----------------------------------|--|---|----------|
| Subjective sleep quality | 1.98±0.84 | 1.05±0.52 | p<0.001 |
| Sleep latency | 2.03±0.82 | 1.06±0.81 | p<0.001 |
| Sleep duration | 1.91±0.74 | 0.89±0.21 | p<0.001 |
| Habitual sleep efficiency | 1.06±1.32 | 0.31±0.63 | p<0.001 |
| Sleep disturbances | 1.88±0.45 | 1.14±0.56 | p<0.001 |
| Sleeping pills use | 0.00±0.00 | 0.00±0.00 | - |
| Daytime dysfunction | 1.29±0.54 | 0.67±0.78 | p<0.001 |
| Total | 10.15±3.51 | 5.12±3.21 | p<0.001 |

The case group had had a significantly lower mean score for the SF-36 and its subscales when compared with the control group (p<0.001) (Table 3).

Table 3. The Distribution of the Mean Scores for the SF-36 and its Subscales

| SF-36 | Case Group (n=38) Mean± SD | Control Group (n=38) Mean ± SD | P |
|-----------------------------|---------------------------------------|---|----------|
| General Health | 53.12±1.22 | 60.13±3.56 | p<0.001 |
| Physical functioning | 66.23±2.45 | 74.14±2.85 | p<0.001 |
| Role-physical | 69.25±3.63 | 76.14±4.74 | p<0.001 |
| Role-emotional | 75.59±2.85 | 80.23±3.56 | p<0.001 |
| Social functioning | 53.74±4.86 | 58.34±5.21 | p<0.001 |
| Pain | 36.25±5.36 | 45.54±5.23 | p<0.001 |
| Vitality | 56.14±4.25 | 63.25±3.45 | p<0.001 |
| Mental health | 50.45±5.25 | 56.51±4.56 | p<0.001 |

DISCUSSION

This cross-sectional and case-control study was performed to examine the effects of RLS on the quality of life and sleep during pregnancy, and the pregnant women were shown to have a lower quality of life and sleep. This suggests that early diagnosis of this syndrome and conduction of appropriate interventions for its treatment are important.

The finding that the case and control groups were similar in their sociodemographic and obstetric features allowed comparing them in terms of the quality of life and sleep.

Pregnancy affects all the systems and functions of the body including the sleep pattern and quality. Therefore, sleep disturbances frequently appear during pregnancy (Köybaşı & Oskay, 2017). Pregnancy can have a negative effect on the sleep quality even in the absence of extra complications. It has been reported that the rate of the poor sleep quality varies from 46% to 89.3% in pregnant women (Ko, Chang, & Chen, 2010; Köybaşı & Oskay, 2017; Mindel, Cook, & Nikolovski, 2015; Naghi, Keypour, Ahari, Tavalai, & Khak, 2011; Naud, Ouellet, Brown, Pasquier, & Moutquin, 2010; Reutrakul, Zaidi, Wroblewski, Kay, & Van Cauter, 2011; Taşkıran, 2011). In the current study, both the women with RLS and those without this syndrome were found to have a poor sleep quality, which is consistent with the literature. This finding suggests that all factors which are likely to affect the sleep quality in pregnancy should

be examined in detail. However, the women with RLS had a lower sleep quality. Compatible with this finding, a study in Japan showed that RLS can affect sleep disturbances (Suzuki et al., 2003). Similarly, Dunietz et al. reported that RLS is an important factor disrupting the sleep quality (Dunietz et al., 2017). In a study by Panvatvanich and Lolekha, the women with RLS were found to have a lower sleep quality than those without this syndrome, though the difference was not statistically significant (Panvatvanich & Lolekha, 2019). This conflicting evidence about the effects of RLS on the sleep quality in pregnancy shows that further studies about the issue are needed.

In the current study, the case group was found to have a significantly lower life quality than the control group. Pregnancy is a period during which important physical and emotional changes appear. These changes affect the life quality even in healthy pregnant women who are not experiencing any complications and may lead to changes in women's and their babies' health status (Kostanoğlu, Manzak, & Şahin, 2019). In addition to the pregnancy-related changes, restlessness, pain and tiredness and resultant conditions such as anxiety and depression caused by RLS can have a negative effect on the life quality (Demirci & Şahin, 2016). Akbaş and Sözbir performed a study with 134 pregnant women with RLS and 116 pregnant women without RLS, and found out that the former group had a lower life quality (Akbaş & Sözbir, 2019). In addition, Telarovic et al. reported that women experiencing this condition during their pregnancy had lower life quality (Telarovic et al., 2017). In summary, the finding of the present study about the life quality of pregnant women with RLS is congruent with the evidence from a limited number of studies. It seems that randomized-controlled studies are needed to; determine the factors affecting the life quality in these women and to enhance their life quality.

The present study involves two limitations. The data collection tools were based on self-reports of the pregnant women. Obtained data can be different from the situations observed by the participants. Besides, although the study had appropriate sampling, obtained results can only be generalized to the study population.

CONCLUSION

In this study, the pregnant women with RLS had a lower quality of life and sleep than those without this condition. It can be suggested that the quality of life and sleep in pregnancy should be dealt carefully. Early diagnosis and treatment of RLS in pregnancy can create a positive influence on maternal and infantile health. Health professionals, especially those working in primary healthcare institutions should be aware of the adverse effects of RLS on

maternal and infantile health, refer the women with this condition to appropriate health centers and play an effective role in their diagnosis and treatment.

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