Document heading doi: 10.21276/apjhs.2019.6.1.3 **Research Article**

The Relationship between Restless Legs Syndrom and Sleep Quality in the Third Trimester Pregnant Women

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Abstract

Introduction: The aim of this study was investigate the relationship between sleep quality and Restless legs syndrome (RLS) inthird trimester pregnant women. **Methods:** There were 266 pregnant women enrolled in this observational longitudinal study. RLS was diagnosed clinically using the four essential criteria of the International RLS Study Group. The demographic features of participants were recorded, as well as RLS symptoms and sleep quality [assessed using the Pittsburgh Sleep Quality Index (PSQI). Total PSQI scores ≥5(range 0–21) indicate poorer sleep quality, and total scores<5 indicate good sleep quality. **Results:** The incidence of RLS was found to be 31.6%. In addition, pregnant women who were with RLS symptoms (57.1%) had significantly poorer sleep quality than those without RLS symptoms (45.1%) and that poor sleep quality was collerated to increased prevelance of RLS in third trimester pregnant women (p = 0.044). Anegative correlation between RLS and sleep quality was found, at the level of 21%. **Conclusion:**Women who had poor sleep quality higher prevelance of with RLS in the third trimester. A negative correlation between RLS and sleep quality was found in this study.
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Key Word: Restless Legs Syndrome, Pregnancy, Sleep Quality, Midwives.

Introduction

Restless legs syndrome (RLS)(also called Willis-Ekbom disease) is a disease that causes an urge to move the legs. While there is often short-term comfort with activity, continued activitycan result in sensory and motor symptoms, such as paresthesia, and a tingling or burning sensation in the legs. Symptoms are usually seen in the legs and, rarely, in the arms, and are felt more during the evening or early night and when at rest[1]. Pregnancy is a risk factor for the development of RLS, but the underlying reason for this is not known exactly. RLS in pregnant women was first defined in the study conducted by Ekbom in 1945, and its prevalence was stated to be 11%[2].

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Later, in different studies, various different prevalence estimates were obtained. In recent years,prevalence studies found an increase,at 19%[3].Chen et al (2012), in their study conducted in Taiwan, found a prevalenceof 10.4%[4].The prevalence of RLS in pregnancy varies from one trimester to the next. The prevalence of RLS increases as pregnancy progresses. In Pakistan,Sikandar et al (2009) found aprevalence of RLS in third-trimester pregnancies of 30%[5].In France,Neau et al (2010) found a prevalence of 32%[6]. In two studies carried out in Turkey,Şahin et al (2007) found the prevalence of RLS to be 19% (and 20.4% in third-trimester pregnancies), and İsmailoğulları et al (2010) found it to be 10.5%[7,8].
RLS is particularly important because it is a major cause of the increasing prevalence of sleep disorders in pregnancy[9]. Chen et al (2012) found that 81.2% of pregnant subjects who had RLS also had poor sleep quality[4]. It is known from sleep-quality studies that the poor sleep quality has negative effects on labor and fetal health. In pregnant women with poor sleep

quality,the birth type is usually cesarean section, and in vaginal deliveries, the labor process is longer. The effects of poor sleep quality on neonatal health is seen in low neonatal birth weight and low neonatal Apgar scores[10-12].

Most studies have been cross-sectional or case/control or have only focused on sleep quality and its effects during the third trimester of pregnancy.To the best of our knowledge, there are few published studies on the relationship between sleep quality and RLS during pregnancy.

We aimed to (i) determine the prevalence of RLS,(ii) identify sleep quality in pregnant women, and (iii)investigate the relationship between sleep quality and RLS during the third trimester of pregnancy.

Methods

Study Design

This study was an observational longitudinal study.

Research Sample

The study subjects were pregnant women who visited the pregnancy monitoring outpatient department and attended training classes for pregnant women at the a training and research hospital. The study sample consisted of pregnant women who were in their third trimester (gestational age 27 weeks or older) and who visited the pregnancy monitoring outpatient department and attended training classes for pregnant women between June and September 2014. Six hundred and fifty third trimester pregnant women were the target population for the study. The sample size was determined using the formula ($n = Nt^2pq^2 / d^2 (N - 1) + t^2pq$), where N is the number of the population, t is the degree of significance(5%), p is the probability of occurrence, q is the probability of nonoccurrence, and d is sensitivity. Also, the Creative Research Systems (http://www.surveysystem.com/sscalc.htm) sample size calculator was used for this purpose. The confidence level was set at 95%, and the confidence interval was set at 5%. With both methods, 242 responses were required in order to be representative of the pregnant women. However, considering the possibility of incomplete or unreturned questionnaires, By adding 24 extras (10% of the sample), the study sample consisted of 266 pregnant women.

Data Collection

The survey, which included demographic data, information about the pregnancy, and a four-question diagnostic criteria based on the patient's history, was created by the International Restless Legs Syndrome Study Group(IRLSSG) in 1995 and the Pitsburg Sleep Quality Scale were filled by face to face interviews. According to this survey, women who answered yes to the following 4 questions were considered as RLS (+).

IRLSSG

The widely accepted criteria for diagnosis of RLS are the IRLSSG 1995 and revised 2002 criteria:

- An urge to move the legs usually but not always accompanied by or felt to becaused by uncomfortable and unpleasant sensations in the legs.
- The urge to move the legs and any accompanying unpleasant sensations begin or worsen during periods of rest or inactivity, such as lying down or sitting.
- The urge to move the legs and any accompanying unpleasant sensations are partially or totally relieved by movement, such as walking or stretching, at least for as long as the activity continues.
- The urge to move the legs and any accompanying unpleasant sensations during rest or inactivity only occur in the evening or are worse in the evening or night than during the day[13].

Pittsburgh Sleep Quality Index [PSQI)

Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI), a self-report questionnaire that assesses leep quality and disturbance during the previous month[14]. The PSQI contains 19 items and measures seven components of sleep quality: subjectives leep quality, sleep latency[time to fall asleep and frequency of not falling asleep within 30 minutes), sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and day time dysfunction. Each item is scored on a 0 to 3 scale, whereby 3 reflecting the negative extreme on the Likert scale. The summed scores for the seven components form a global PSQI score (range = 0–21); higher scores indicate poorer sleep quality. A global score ≥ 5 indicates poor sleep, and yields a diagnostic sensitivity of 98.7% and specificity of 84.4% for diagnosing sleep disturbances. Cronbach'sα for the present study was 0.85[14,15].

Inclusion Criteria

Inclusion criteria were as follows: age 18–45 years; no chronic illnesses in the pre-pregnancy period or during pregnancy; in the third trimester of pregnancy; RLS (-) before pregnancy.

Data Analysis

Data from the results of the research were evaluated using Statistical Package for Social Sciences (SPSS) 15.0 software. Descriptive statistical methods (means and standard deviation, medians and frequencies, rates, and minimum and maximum values) were used to

compare quantitative data.For group comparisons, Student's*t*-test was used for normally distributed data and the Mann Whitney U test was used to comparenon-normally distributed data. Spearman's correlation coefficient was used to evaluate the relationship between RLS and the PSQI.

Ethics

Ethics committee approval was obtained from the Istanbul Zeynep Kamil Maternal and Children's Hospital Clinical Research Ethics Assessment Committee. Verbal consent was obtained from all pregnant women comprising the study sample, after they were given an explanation of the purpose and benefits of the research and their role in the research, and informed that their participation in the study was voluntary.

Results

The mean age of the pregnant women was 28.7 ± 4.83 years (range 18–45 years), and 32% of them were high school graduates and 53% university graduates. Eighty-one pregnant women (31.6%) who answered yes to all four questions identified by the IRLSSG were evaluated as pregnant women with RLS symptoms.

There was no difference in age, gestational age, receiving prenatal care, consuming tea and coffee between women with and without RLS (Table 1).

It was found that pregnant women who were with RLS symptoms (57.1%) had significantly poorer sleep quality than those without RLS symptoms(45.1%). The chi-squared test for trend showed that poor sleep quality was collerated to increased prevelance of RLS in third trimester pregnant women (p = 0.044)(Table 2).

When the relationship between RLS symptoms and sleep quality in pregnant women in their third trimester was evaluated; there was a negative correlation found between RLS and the PSQI at a level of 21% (r = 0.210; p = 0.001)(Table 3).

In pregnant women with RLS symptoms, the components of overall sleep quality (p = 0.002), sleep latency (p = 0.001), sleep efficiency (p = 0.003), and total sleep quality score (p = 0.001) were found to be significantly higher than in pregnant women without RLS symptoms. There was no significant difference found between the components duration of sleep (p = 0.059), sleep disturbance (p = 0.130), need meds to sleep(p = 0.319), and daytime dysfunction due to sleepiness(p = 0.771)(Table 4).

Table 1: Characteristics of pregnant women with and without RLS symptoms

	With RLS Symptoms Mean ± SD	**Without RLS Symptoms Mean ± SD**	**p values**
Age	27.94 ± 4.48	28.99 ± 4.91	0.870
Gestational age	29.54 ± 4.76	28.86 ± 5.45	0.308
Receiving prenatal care	8.89 ± 4.24	8.51 ± 3.82	0.484
Consuming tea	2.85 ± 2.33	2.86 ± 2.43	0.970
Consuming coffee	0.21 ± 0.58	0.33 ± 0.69	0.140

Table 2: Pittsburg Sleep Quality Index values of pregnant women with and without RLS symptoms

PSQI	**With RLS Symptoms n[%)**	**Without RLS Symptoms n[%)**	**Total**	**Statistics**
Good sleep quality [<5)	36[42.9)	100[54.9)	136[51.1)	X^2 =3.361
Poor sleep quality [≥5)	48[57.1)	82[45.1)	130[48.9)	**0.044**
Total	84[31.6)	182[68.4)	266[100.0)	

Table 3.Correlation between RLS and sleep quality in third-trimester pregnant women

		Pittsburg Sleep Quality Index [PSQI)							
		Overall sleep quality	Sleep latency	Duration of sleep	Sleep efficiency	Sleep disturbance	Need meds to sleep	Daytime dysfunction due to sleepiness	PSQI total
RLS	r	−0.214	−0.205	−0.116	−0.183	−0.091	0.042	−0.019	−0.210
	p	0.000	0.001	0.059	0.003	0.138	0.498	0.759	0.001

Table 4: Pittsburg Sleep Quality Index components of pregnant women with and without RLS symptoms

PSQI	With RLS Symptoms Mean ± SD	Without RLS Symptoms Mean ± SD	P values
Overall sleep quality	1.45 ± 0.78	1.14 ± 0.60	**0.002**
Sleep latency	1.48 ± 0.98	1.07 ± 0.90	**0.001**
Duration of sleep	0.54 ± 0.95	0.33 ± 0.72	0.059
Sleep efficiency	0.99 ± 1.14	0.59 ± 0.93	**0.003**
Sleep disturbance	1.70 ± 0.53	1.59 ± 0.57	0.130
Need meds to sleep	0.00 ± 0.00	0.01 ± 0.14	0.319
Day dysfunction due to sleepiness	0.86 ± 0.89	0.82 ± 0.77	0.771
PSQI total	7.02 ± 3.48	5.56 ± 3.02	**0.001**

Discussion

According to epidemiological studies, RLS is seen in 1–15% of the general population[16,17].The prevalence of RLS in pregnancy was first reported by Ekbom et al (1945) as 11%[2]. In subsequent years, the prevalence of RLS was indicated to be between 10.4% and 27%[3,4]. In the study by Manconi et al (2002), the prevalence of RLS was found to be higher in the third trimester of pregnancy, and that existing RLS symptoms worsen in the third trimester. The prevalence of third-trimester RLS varies between 31.6%- 20.4%[5-7,18].Previous epidemiological data showed that pregnant women have a two to three times higher risk of experiencing RLS than the general population[16,17]. Our study's results confirms this high prevalence of RLS during pregnancy, which has been estimated to be from 11% to 26−27% and even as high as 30%[2-6,19, 20].This prevalence is higher during the third trimester, which is the most critical had symptom onset inthe fifth to eighth month of pregnancy, and nearly one third of the pregnant women in our study met all four international RLS study group criteria during this period[4-6, 20]. However, this relatively high prevalence of RLS could be due to using different measurement devices[21].

In this study, 57.1% of pregnant women had poor sleep quality, and the sleep quality of pregnant women with RLS symptoms was found to be higher than that of pregnant women without RLS symptoms ($p = 0.044$).RLS affects sleep quality in 15% of the population[22].The PSQI, which was assessed on the basis of participant self-reports, does not indicate the presence and prevalence of sleep disorders. It provides subjective data about sleep quality. A total PSQI score of ≥5 indicates poor sleep quality.

When the relationship between RLS symptoms and sleep quality in pregnant women who were in the third trimester was evaluated, there was a negative correlation found between RLS and PSQI score, at a level of 21% ($r = 0.210$; $p = 0.001$). It can be said that the presence of RLS symptoms negatively affects the ability to fall asleep, to continue to sleep, and habitual sleep efficiency. It is known that the poor sleep quality during pregnancy has negative effects on labor and fetal health. In pregnant women with poor sleep quality, the birth type was usually cesarean section, and if it was a vaginal delivery, the labor process would have been longer. The effects of poor sleep quality on neonatal health is seen in low neonatal birth weight and low neonatal Apgar scores[10, 12]. To determine the causes of RLS, which is one of the major sleep disorders, particularly in pregnancy[9], is important because it will provide a positive impact on the carrying out the treatment efficiency maternal and fetal health.

The PSQI subcomponents overall sleep quality, which people evaluated on their own ($p = 0.002$), sleep latency which assesses dozing duration ($p = 0.001$), and sleep efficiency ($p = 0.003$) were significantly higher in pregnant women with RLS symptoms than in those who were without RLS symptoms.There was no significant difference between pregnant women with RLS symptoms and without RLS symptoms in duration of sleep ($p = 0.059$), sleep disturbance ($p = 0.130$), needing meds to sleep($p = 0.319$), or day dysfunction due to sleepiness($p = 0.771$). This result was striking and suggests that conditions associated with pregnancy, such as nausea, increased need to urinate, heartburn, shortness of breath, leg cramps, varicose veins, back pain, forced body position in bed, gastroesophageal reflux, and fetal movements might result in poor sleep similar to that of RLS[23,24].So, there are many reasons for poor sleep quality, other than RLS, in pregnant women. Our results do not indicate that pregnant women with RLS symptoms do not have sleep complaints; in our opinion, the results suggest that all pregnant women, with or without RLS symptoms, have sleep complaints.

Conclusion

Women who had poor sleep quality higher prevelance of with RLS in the third trimester. In this study, about one third of the pregnant women were with RLS symptoms, and those who were with RLS symptoms had poorer sleep quality. RLS, which adversely affects the quality of sleep, is not well understood by health care professional and particularly by pregnant women. Therefore, it would be useful to screen pregnant women for RLS symptoms.

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