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ORIGINAL ARTICLE

Frequency and risk factors of restless leg syndrome in pregnant women

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ABSTRACT

Background: Restless leg syndrome (RLS) is a prevalent neurological condition in pregnancy, and is associated with poor maternal and fetal outcomes

Objective: To determine the frequency and the risk factors leading to restless leg syndrome in pregnant women.

Methods: A cross-sectional descriptive study was conducted from 3rd December 2023 to 2nd June 2024, at the Obstetrics & Gynecology department of Bilawal Medical College and affiliated Countess of Dufferin Fund Hospital, Jamshoro, Pakistan. Pregnant women from all trimesters, aged 20–40 years, were recruited using non-probability consecutive sampling after obtaining informed consent. Pregnant women having painful legs, peripheral neuropathy, akathisia, nocturnal leg cramps, peripheral vascular disease, pre-gestational diabetes, renal failure, and varicose veins were excluded. RLS was diagnosed based on the 2012 revised International RLS Study Group (IRLSSG) criteria. 5 mL of blood was collected for complete blood count (CBC) and iron studies. Data analysis was performed using SPSS Version 22.

Results: A Total of 204 participants were included. The mean age of the pregnant women was 24.83±4.41 years. RLS was observed in 97 participants (47.5%), with the remaining 107 (52.5%) unaffected. RLS was most prevalent in the third trimester, accounting for 22.5% of cases. Most women were multiparous (152, 74.5%), while 52 (25.5%) were nulliparous. Iron deficiency anemia was identified as a significant risk factor for restless leg syndrome, with an odds ratio of 7.839 ($p < 0.001$). Additionally, gestational hypertension (OR=2.679, p=0.041) and chronic hypertension (OR=9.418, p=0.003) were significantly associated with an increased risk of RLS.

Conclusion: Restless leg syndrome affected nearly half of the pregnant women studied, with the highest prevalence observed in the third trimester. Iron deficiency anemia, gestational hypertension, and chronic hypertension were found to be significant risk factors for RLS, highlighting the need for early identification and management of these conditions during pregnancy.

Key Words: Restless Leg Syndrome, Pregnancy, Risk Factors

DOI: 10.53685/jshmdc.v6i1.303

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Received: 19.01.25, 1st Revision: 24.02.25
2st Revision: 10.05.25, Accepted: 18.05.25

How to cite this article: Memon Z, Nisar N, Bakhtawar, Rabia, Ghazala, Sidra**.** Frequency and risk factors of restless leg syndrome in pregnant women. J Shalamar Med Dent Coll. 2025; 6(1): 48-52. doi: 10.53685/jshmdc.v6i1.303

INTRODUCTION

Restless leg syndrome (RLS), also known as Willis-Ekbom disease (WED),[1] is a neurological condition that causes a strong desire to move the legs due to unpleasant stimuli.[2] It is associated with pregnancy, renal diseases, Parkinson's disease, diabetes, cardiovascular disease, low vitamin D levels, and iron deficiency.[3] Around 2-10% of the population has RLS; women are twice as likely to be diagnosed as men.[4] Pregnancy is a substantial risk factor for RLS, although mostly undiagnosed. Several studies have shown that RLS in pregnant women is linked to higher sleep disturbances, as well as eclampsia, preeclampsia, gestational hypertension, cesarean delivery, cardiovascular difficulties, and depressed symptoms.[5] RLS during pregnancy may have a deleterious impact on neonatal outcomes such as miscarriage, premature birth, and intrauterine growth restriction.[6] Iron deficiency is a well-known component of RLS in pregnancy, which is thought to worsen the illness. Many studies have so far implicated the role of iron in the pathogenesis of restless legs syndrome, and a decrease in serum iron levels is found commonly in

pregnant women, suggesting that iron shortage may be linked to pregnancy-related RLS. Giovanna et al. observed that the occurrence of RLS is more frequent among women who are multiparous compared to nulliparous. In addition to parity, advanced maternal age, lower socioeconomic level, increased weight gain during pregnancy, elevated body mass index (BMI), limited physical activity, smoking, and alcohol intake all increase the incidence of RLS.[7,8]

According to Qaiser et al. RLS among pregnant women in the third trimester was 89.2%, whereas another study reported a notably lower prevalence of 11% in Pakistani women.[9,10]

However, despite these findings, there is a notable lack of data concerning the geographical variations in the frequency and risk factors related to RLS. This gap in the literature is particularly concerning, as RLS can have profound implications on the quality of life, sleep, and overall well-being of pregnant women, potentially influencing both maternal and fetal health outcomes. The study aimed to determine the frequency and risk factors leading to RLS in pregnant women.

METHODS

This cross-sectional descriptive study was conducted in the Department of Obstetrics & Gynecology at Bilawal Medical College and affiliated with Countess of Dufferin Fund Hospital, Hyderabad, Pakistan, from 3rd December 2023 to 2nd June 2024. The sample size of 196 was calculated using an OpenEpi calculator, taking a 95% confidence interval, a 6% margin of error, and the frequency of 24.1% of RLS in pregnant women.[11] However, a slightly larger number of patients (n=204) were included to avoid the forms having incomplete information from patients. A non-probability, consecutive sampling technique was used to recruit pregnant women from all three trimesters, aged 20 to 40 years. Patients with painful legs and peripheral neuropathy, akathisia, nocturnal leg cramps, peripheral vascular disease, pre-gestational diabetes, renal failure, and varicose veins were excluded. Detailed demographic, obstetric, and clinical histories were obtained directly from participants through structured interviews, and blood pressure was measured at the obstetrics clinic by the researcher herself after informed consent. Patients who met all five of the 2012 revised International RLS Study Group (IRLSSG) diagnostic criteria were labelled as having RLS. "The IRLSSG diagnostic criteria for Restless Legs Syndrome include an urge to move the legs, often with discomfort, that worsens at rest, improves with movement, and is more severe in the evening or night; another medical or behavioral condition must not solely explain these symptoms.[12]

Variables such as age, residence status, parity, trimester, pre-eclampsia, iron deficiency anemia (IDA), gestational diabetes, pre-gestational diabetes, chronic hypertension, gestational hypertension, and smoking status were recorded using a combination of structured interviews and review of medical records. Five mL of blood was collected for complete blood count (CBC) and iron studies, including hemoglobin, serum ferritin, and transferrin saturation (TSAT). IDA was defined as hemoglobin <11 g/dL, ferritin <15 ng/mL, and TSAT ≤ 20%.

Ethical Approval

The study was conducted from 3rd December 2023 to 2nd June 2024, at the Obstetrics & Gynecology department of Bilawal Medical College, Jamshoro, Pakistan. Ethical approval was obtained from the Research Ethics Committee of Liaquat University of Medical & Health Sciences, Jamshoro, Pakistan (NO. LUMHS/REC/- 569).

Statistical Analysis

SPSS Version 22 was used for data analysis. Descriptive statistics were computed, including means and standard deviations for quantitative variables (age) and frequencies and percentages for qualitative variables (residence, RLS, Preeclampsia, Iron Deficiency Anemia, Gestational Diabetes, Chronic Hypertension, and Gestational Hypertension). Binary logistic regression analysis was performed to assess the risk factors as predictors of RLS.

RESULTS

The mean age of the pregnant women was 24.83±4.41 years, with a minimum age of 18 and a maximum of 39 years. Most females belonged to rural areas, with 140 (68.6%) from rural regions and 64 (31.4%) from urban areas. Among participants, 41 (21.2%) were in the 1st trimester, 86 (42.2%) were in the 2nd Trimester, and 77 (37.7%) were in the 3rd Trimester. Most females were Multiparous, 152 (74.5%), while 52 (25.5%) were nulliparous.

RLS was present in 97 (47.5%) of the participants, whereas 107 (52.5%) did not have RLS, with the majority occurring in the third trimester at 22.5%, followed by 20.6% in the second trimester, and only

4.4% in the first trimester, with a p value<0.05, as shown in figure 1.

Table I: Frequency of risk factors of restless leg syndrome in pregnancy

Risk Factors	n (%)
Pre-Eclampsia	
Yes	44 (21.6%)
No	160 (78.4%)
Gestational diabetes	
Yes	28 (13.7%)
No	176 (86.3)
Iron deficiency anemia	
Yes	148 (72.5%)
No	56 (27.5%)
Gestational hypertension	
Yes	39 (19.1%)
No	165 (80.9%)
Chronic hypertension	
Yes	22 (10.8%)
No	182 (89.2%)
Smoking	
Yes	21 (10.3%)
No	183 (89.7%)

Table 2: Binary logistic regression analysis of risk factors for RLS in pregnancy

Risk factors	B	p value	Exp (B)	95% CI	
				Lower	Upper
Age	-0.05	0.002*	0.87	0.80	0.96
Parity	0.16	0.814	1.10	0.47	2.58
Preeclampsia	0.49	0.423	1.43	0.59	3.46
IDA	1.34	0.000*	7.83	2.89	21.21
GD	-0.15	0.373	1.59	0.57	4.467
G-HTN	.063	0.041*	2.67	1.04	6.887
C-HTN	2.15	0.003*	9.41	2.12	41.77

*Restless leg syndrome= RLS, Iron deficiency anemia (IDA), Gestational Diabetes (GD), Gestational Hypertension (G-HTN), Chronic Hypertension (C-HTN): *p<0.05 was taken as statistically significant.*

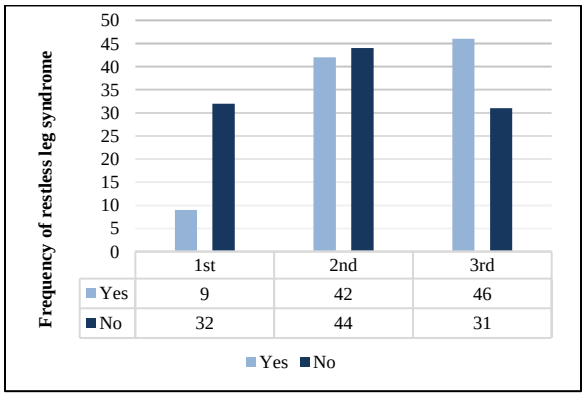

Figure 1. Frequency of restless leg syndrome in different trimesters

A Binary logistic regression analysis (Table: 2) shows that risk factors for pregnancy-related RLS include several variables significantly associated with pregnancy-related RLS. RLS and age were shown to be inversely related (OR=0.87, 95% CI: 0.80–0.96, p=0.002), with decreased probabilities of RLS being associated with older ages. Iron deficiency anemia is a highly significant predictor (OR=7.839, 95% CI: 2.897-21.212, p<0.001), suggesting an increased chance of RLS. Gestational hypertension (OR=2.679, 95% CI: 1.042–6.887, p=0.041) and chronic hypertension (OR=9.418, 95% CI: 2.123–41.776, p=0.003) were significantly linked to higher risks of RLS. RLS did not correlate substantially with parity, preeclampsia, or gestational diabetes (p>0.05).

DISCUSSION

This study aimed to determine the frequency and risk factors predicting RLS in pregnant women. The results of this study revealed a high frequency of RLS among pregnant women, with nearly half of the patients. experiencing symptoms predominantly in the third trimester.

The prevalence of RLS during pregnancy has shown considerable variation across studies, depending on diagnostic criteria, trimester, and demographic variables.[12-13] A study from Pakistan reported a 223.6% prevalence in Pakistan's industrialized regions,[14] while Khan et al. found a prevalence of 24.1% among pregnant women more broadly.[11] A study, however, observed a notably lower prevalence of 11% in Pakistani women.[10] In contrast, our study indicates a markedly higher prevalence of 47.5%, underscoring a potentially heightened need for attention to RLS within prenatal care, especially given this divergence from prior studies.

In the current study, RLS was more common in the third trimester of pregnancy (p=0.001). This result is consistent with an earlier study that found that the prevalence of RLS increases during the third trimester of pregnancy and worsens as the pregnancy progresses.[15] Several physiological and hormonal changes that worsen in the later stages of pregnancy, such as increased circulatory demands, iron requirements, and more strain on the musculoskeletal system, could cause this trimester-related rise. To effectively treat symptoms of RLS and lessen their adverse effects on the mother's health and sleep quality, our findings highlight the necessity of focused therapies in the later stages of pregnancy.[16]

The present study found that RLS was less likely to be associated with older maternal age, in contrast to the data published by Na et al., who revealed a distinct age-related pattern. This disparity may reflect differences in study populations, methodology, or other demographic characteristics that influence RLS prevalence among age groups.[17]

Iron deficiency anemia is a well-known risk factor for the development of RLS during pregnancy, with iron having an important role in neural function and dopamine control, both of which are necessary in preventing RLS symptoms. Low iron levels and anemia contribute to the beginning of RLS, as insufficient iron affects dopamine circuits involved in sensory and motor control.[18] In the present study, iron deficiency anemia was discovered as a key predictor of RLS, which supports these findings.

Although gestational diabetes and preeclampsia are recognized as risk factors for pregnancy complications,[19-20] including RLS, in present study the regression model did not reveal a statistically significant association. This suggests that, despite its established links with various pregnancy complications, gestational diabetes and preeclampsia may not have a strong enough direct impact on RLS risk.

CONCLUSION

Restless leg syndrome affected nearly half of the pregnant women studied, with the highest prevalence observed in the third trimester. Iron deficiency anemia, gestational hypertension, and chronic hypertension were found to be significant risk factors for RLS, highlighting the need for early identification and management of these conditions during pregnancy.

There is a significant gap in maternal healthcare, emphasizing the urgent need for greater clinical awareness and focused interventions, especially in the later stages of pregnancy, when the impact of RLS is more pronounced

Limitations of study and future recommendations

The study was conducted on a small sample size with patients from one hospital only. Future studies should include larger and more diverse populations to improve the generalizability of the findings across different demographic groups and implement longitudinal designs to track the progression of RLS symptoms across all three trimesters.

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AUTHOR'S CONTRIBUTIONS:

- **ZM:** Study design, data acquisition & analysis, manuscript drafting, critical review
- **NN**: Conception of study, interpretation of data, manuscript drafting
- **B:** Data collection, critical review, manuscript drafting
- **R:** Study design, interpretation of data, critical review
- **G:** Data collection, critical review, manuscript drafting
- **S:** Data collection and manuscript drafting

All authors approved the final version to be published and agreed to be accountable for all aspects of the work, ensuring that any questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

CONFLICT OF INTEREST:

None

GRANT SUPPORT AND FINANCIAL DISCLOSURE:

Authors declared no specific grant for this research from any funding agency in the public, commercial or non-profit sectors

DATA SHARING STATEMENT:

The data are available from the corresponding author upon request.