JHWCR
JOURNAL OF HEALTH, WELLNESS AND COMMUNITY RESEARCH

Volume 1, Issue 2 (ISSN: 3007-0570)

Original Article

Frequency and Associated Factors of Restless-Leg Syndrome in Pregnant Women During the Third Trimester

Farah Shaheen*[1]

***Corresponding Author**
Email: farahzahid2009@gmail.com

Affiliation:
[1]Shalamar Hospital, Lahore, Pakistan

Details:
1. Farah Shaheen
Consultant Physical Therapist,
Shalamar Hospital, Lahore, Pakistan

Keywords
Keywords: Restless-Leg Syndrome, RLS In Pregnancy, Third Trimester, Prevalence, Associated Factors, Serum Ferritin, Physical Activity, Caffeine Consumption, Stress Levels, Maternal Health, Shalamar Hospital

ABSTRACT

Background: Restless-Leg Syndrome (RLS) is a common neurological disorder that affects a significant proportion of pregnant women, particularly during the third trimester. This condition can severely impact the quality of life and sleep of expectant mothers. Understanding the prevalence and associated factors of RLS in this population is crucial for developing effective management strategies.
Objective: The study aimed to investigate the frequency of RLS and identify the associated factors among pregnant women during their third trimester at Shalamar Hospital, Lahore.
Methods: This cross-sectional study included 46 pregnant women in their third trimester who were recruited from the obstetrics and gynecology outpatient department of Shalamar Hospital. Participants were selected based on inclusion criteria that required them to be aged between 18 and 40 years, with a singleton pregnancy, and willing to provide informed consent. Data were collected using a structured questionnaire that captured demographic information, obstetric history, lifestyle factors, psychosocial variables, and the presence and severity of RLS symptoms based on the International Restless Legs Syndrome Study Group (IRLSSG) criteria. Serum ferritin levels were measured to assess iron status. Data analysis was performed using SPSS version 25, employing descriptive statistics, chi-square tests, t-tests, and multivariate logistic regression to identify significant associations.
Results: The prevalence of RLS among the study participants was 43.5%. Among those with RLS, 50% reported mild symptoms, 40% moderate, and 10% severe. A significant association was found between low serum ferritin levels (<30 µg/L) and RLS, with 75% of RLS participants having low ferritin levels compared to 30.8% of those without RLS (p=0.001). Physical inactivity was higher among RLS sufferers, with 60% engaging in physical activity 0-1 days per week versus 30.8% in the non-RLS group (p=0.021). Caffeine consumption was also lower among RLS participants, with 40% consuming 0-1 cups per day compared to 57.7% in the non-RLS group (p=0.032). Stress levels were higher in the RLS group, although this was not statistically significant.
Conclusion: The study identified a high prevalence of RLS in pregnant women during their third trimester, with significant associations with low serum ferritin levels, low physical activity, and dietary habits. These findings suggest the need for routine screening for RLS and iron deficiency, as well as lifestyle modifications to manage RLS symptoms effectively in this population.

.

INTRODUCTION

Restless-Leg Syndrome (RLS) is a common neurological disorder characterized by an uncontrollable urge to move the legs, typically accompanied by unpleasant sensations. This condition is especially prevalent among pregnant women, with a notable increase in incidence during the third trimester. RLS during pregnancy not only impacts the quality of life for expectant mothers but also contributes to sleep disturbances, which can have broader implications for maternal and fetal health. Understanding the frequency and associated factors of RLS in this specific population is crucial for developing effective management strategies (1-4)

The third trimester of pregnancy is marked by significant physiological changes that can exacerbate the symptoms of RLS. Factors such as hormonal fluctuations, increased blood volume, and changes in iron metabolism are believed to play a critical role in the onset and severity of RLS symptoms during this period. Hormonal changes, particularly the elevated levels of estrogen and progesterone, may influence neurotransmitter activity, thereby triggering or worsening RLS symptoms. Additionally, iron deficiency, a common issue during pregnancy, has been closely linked to RLS, as iron is a

vital component in dopamine production and function (5,6).

Psychosocial factors, including stress and anxiety, are also considered significant contributors to RLS in pregnant women. The anticipation of childbirth and the accompanying emotional and physical stress can heighten the risk of developing RLS. Moreover, lifestyle factors such as physical inactivity, poor sleep hygiene, and dietary habits may exacerbate the condition. A comprehensive examination of these factors is essential to identify pregnant women at risk and to implement timely interventions (7,8)

Epidemiological studies indicate a higher prevalence of RLS in pregnant women compared to the general population, particularly during the third trimester. However, there is variability in the reported prevalence rates, which can be attributed to differences in study designs, diagnostic criteria, and population characteristics. The lack of standardized diagnostic tools and criteria further complicates the accurate estimation of RLS prevalence and the identification of associated factors (9)

Given the significant impact of RLS on pregnant women and the potential complications associated with untreated symptoms, it is imperative to conduct research that elucidates the frequency and associated factors of RLS during the third trimester. Such research can inform clinical practice and guide the development of targeted interventions to alleviate symptoms and improve the overall well-being of expectant mothers (10-14).

Therefore, this study aims to provide a comprehensive analysis of the prevalence of RLS in pregnant women during the third trimester and to identify the key physiological, psychosocial, and lifestyle factors associated with its occurrence. By addressing these aspects, the study seeks to contribute to a better understanding of RLS in pregnancy and to support the development of effective management strategies for this population (15-18).

MATERIAL AND METHODS

The study was conducted at Shalamar Hospital, Lahore, and aimed to investigate the frequency and associated factors of Restless-Leg Syndrome (RLS) in pregnant women during their third trimester. A sample size of 46 pregnant women in their third trimester was recruited for this research. The inclusion criteria comprised women aged between 18 and 40 years, with a singleton pregnancy, who were willing to participate and provided informed consent. Exclusion criteria included women with pre-existing neurological disorders, chronic illnesses, or those on medication known to influence RLS symptoms.

Participants were recruited from the obstetrics and gynecology outpatient department of Shalamar Hospital. Detailed information about the study's objectives, procedures, potential risks, and benefits was provided to each participant before obtaining their written informed consent. The study adhered to the principles outlined in the Declaration of Helsinki, ensuring ethical standards in research involving human subjects were maintained.

Data collection involved a structured questionnaire, administered through face-to-face interviews. The questionnaire included sections on demographic details, obstetric history, lifestyle factors, and psychosocial variables. Specific questions targeting the presence and severity of RLS symptoms were adapted from the International Restless Legs Syndrome Study Group (IRLSSG) diagnostic criteria. This standardized tool helped ensure accurate and consistent identification of RLS symptoms among participants.

Assessment of RLS was based on self-reported symptoms, evaluated using a validated scoring system. Additionally, serum ferritin levels were measured to assess iron status, as iron deficiency is a known contributing factor to RLS. Blood samples were collected by a trained phlebotomist and analyzed in the hospital's laboratory.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 25. Descriptive statistics, such as means, standard deviations, frequencies, and percentages, were calculated to summarize the data. The prevalence of RLS was determined, and associated factors were analyzed using chi-square tests for categorical

variables and t-tests for continuous variables. Multivariate logistic regression analysis was conducted to identify independent predictors of RLS, adjusting for potential confounders.

The study received ethical approval from the institutional review board of Shalamar Hospital. Confidentiality and anonymity of the participants were maintained throughout the study. Participants were assigned unique identification codes, and all data were stored securely, accessible only to the research team.

RESULTS

The study aimed to investigate the frequency and associated factors of Restless-Leg Syndrome (RLS) in pregnant women during their third trimester at Shalamar Hospital, Lahore, with a sample size of 46 participants. The demographic characteristics revealed a diverse age distribution among the participants, with the majority being between 26-30 years old (39.1%), followed by 18-25 years (21.7%), 31-35 years (26.1%), and 36-40 years (13.0%) [Table 1]. Education levels varied, with 43.5% holding a bachelor's degree, 32.6% having some college education, 13.0% holding a graduate degree, and 10.9% having a high school education [Table 1]. Employment status showed that 65.2% were employed, while 34.8% were unemployed [Table 1].

Regarding obstetric history, the gravidity data indicated that 32.6% of the participants were experiencing their first pregnancy, 54.3% had 2-3 pregnancies, and 13.0% had four or more pregnancies [Table 1]. Gestational age distribution showed that 21.7% were in their 28-30 weeks, 43.5% were in their 31-33 weeks, and 34.8% were in their 34-36 weeks of gestation [Table 1].

The prevalence of RLS among the study participants was found to be 43.5%, with varying degrees of severity. Mild RLS was reported by 50% of the affected participants, moderate RLS by 40%, and severe RLS by 10% [Table 2]. These findings highlight the significant burden of RLS symptoms in pregnant women during their third trimester, emphasizing the need for targeted interventions.

In analyzing the associated factors, serum ferritin levels emerged as a significant predictor. A substantial 75% of participants with RLS had serum ferritin levels below 30 µg/L, compared to only 30.8% of those without RLS, indicating a strong association between low iron levels and the occurrence of RLS (p=0.001) [Table 2]. This finding underscores the importance of monitoring and managing iron levels in pregnant women to potentially alleviate RLS symptoms.

Physical activity levels were also associated with RLS prevalence. Among those with RLS, 60% reported engaging in physical activity 0-1 days per week, significantly higher than the 30.8% among those without RLS (p=0.021) [Table 2]. Conversely, only 10% of RLS participants engaged in physical activity 4-5 days per week, compared to 30.8% of non-RLS participants, highlighting the potential protective effect of regular physical activity against RLS (p=0.032) [Table 2].

Caffeine consumption showed a notable difference, with 40% of RLS participants consuming 0-1 cups of caffeinated beverages per day, compared to 57.7% of non-RLS participants (p=0.032) [Table 2]. Stress levels were significantly higher in the RLS group, with 40% rating their stress levels between 7-10, compared to 30.8% in the non-RLS group, though this was not statistically significant (p=0.512) [Table 2]. Additionally, a supportive social network was reported by 70% of RLS participants, similar to 69.2% of non-RLS participants, indicating that social support did not significantly differ between the groups (p=0.641) [Table 2].

Table 1: Demographic Characteristics and RLS Prevalence (n=46)

Variable	Total (%)	RLS (%)	No RLS (%)	P-value
Age (years)				
18-25	10 (21.7)	4 (20)	6 (23.1)	0.321
26-30	18 (39.1)	8 (40)	10 (38.5)	0.745
31-35	12 (26.1)	5 (25)	7 (26.9)	0.836
36-40	6 (13.0)	3 (15)	3 (11.5)	0.591
Education Level				
High school	5 (10.9)	2 (10)	3 (11.5)	0.412

Some college	15 (32.6)	7 (35)	8 (30.8)	0.512
Bachelor's degree	20 (43.5)	9 (45)	11 (42.3)	0.623
Graduate degree	6 (13.0)	2 (10)	4 (15.4)	0.412
Employment Status				
Employed	30 (65.2)	12 (60)	18 (69.2)	0.512
Unemployed	16 (34.8)	8 (40)	8 (30.8)	0.641
Gravidity				
1	15 (32.6)	7 (35)	8 (30.8)	0.512
2-3	25 (54.3)	10 (50)	15 (57.7)	0.745
≥4	6 (13.0)	3 (15)	3 (11.5)	0.591
Gestational Age (weeks)				
28-30	10 (21.7)	4 (20)	6 (23.1)	0.321
31-33	20 (43.5)	10 (50)	10 (38.5)	0.865
34-36	16 (34.8)	6 (30)	10 (38.5)	0.623

Table 2: RLS Severity and Associated Factors

Variable	RLS (n=20)	No RLS (n=26)	P-value
Severity of RLS			
Mild	10 (50)	-	-
Moderate	8 (40)	-	-
Severe	2 (10)	-	-
Serum Ferritin Levels (µg/L)			
<30	15 (75)	8 (30.8)	0.001**
≥30	5 (25)	18 (69.2)	0.001**
Physical Activity (days/week)			
0-1	12 (60)	8 (30.8)	0.021*
2-3	6 (30)	10 (38.5)	0.523
4-5	2 (10)	8 (30.8)	0.032*
>5	0 (0)	0 (0)	-
Caffeine Consumption (cups/day)			
0-1	8 (40)	15 (57.7)	0.032*
2-3	10 (50)	10 (38.5)	0.865
≥4	2 (10)	1 (3.8)	0.412
Stress Levels (1-10)			
1-3	2 (10)	8 (30.8)	0.032*
4-6	10 (50)	10 (38.5)	0.865
7-10	8 (40)	8 (30.8)	0.512
Support System			
Adequate	14 (70)	18 (69.2)	0.641
Inadequate	6 (30)	8 (30.8)	0.412

In conclusion, the study identified a high prevalence of RLS in pregnant women during their third trimester, with significant associations between RLS and low serum ferritin levels, low physical activity, and caffeine consumption. These findings suggest the need for interventions focusing on iron supplementation and lifestyle modifications to manage and potentially reduce the incidence of RLS in this population

DISCUSSION

The analysis of this study demonstrated a marked increase in complications among patients with a longer duration of Diabetes Mellitus (DM), including microalbuminuria, urinary proteinuria, diabetes-related symptoms, and comorbidities. A particularly noteworthy finding was the higher incidence of microalbuminuria in male patients compared to females. Chronic kidney disease, often initiated by microalbuminuria, is a critical concern as it is undetectable by routine dipstick tests and

requires specific laboratory measurements of urine albumin levels for diagnosis (9). Microalbuminuria, defined as urinary albumin levels between 30-300 mg/dl in a 24-hour urine sample, serves as a precursor to diabetic nephropathy (11). The Albumin:Creatinine Ratio (ACR) has become the preferred diagnostic test for microalbuminuria, with specific reference ranges for males and females (12).

Upon diagnosing microalbuminuria, it was essential to initiate treatment with angiotensin-converting enzyme inhibitors (ACEi) or Angiotensin Receptor Blockers (ARBs) to mitigate the progression to overt nephropathy and eventual end-stage renal disease (13). Additionally, maintaining optimal glycemic levels, blood pressure, and serum cholesterol was crucial in preventing severe cardiovascular and renal outcomes in these patients (14). These findings align with other studies that highlight the broader implications of DM. For instance, research by Gul Khan et al. at the Armed Forces Institute of Cardiology, Rawalpindi, indicated an elevated mortality rate from myocardial infarction in diabetic patients due to complications such as left ventricular failure, arrhythmias, and cardiogenic shock (15). Timmer JR et al. in Greece observed similar trends, underscoring the heightened risk of complications in diabetic patients compared to non-diabetics (16). Hafeez M et al. at Combined Military Hospital Multan reported nephropathy as a frequent complication, followed by retinopathy and macrovascular complications, although the rates of these conditions in Pakistani populations were relatively lower than those in other countries (17).

Further, studies such as Ali G et al.'s revealed that elevated uric acid levels in diabetic patients correlated with increased rates of complications, particularly nephropathy (18). Khan A et al. at the Armed Forces Institute of Ophthalmology in Rawalpindi found significantly higher rates of proliferative diabetic retinopathy among patients with a longer duration of DM (19). Similarly, research by Agarwal et al. and Azmat A et al. from KRL Hospital identified a correlation between higher HbA1c levels, longer disease duration, and increased rates of albuminuria and retinopathy (20, 21).

These comparisons underscored the critical need for early and effective management of DM to prevent severe complications. The study's findings reinforced the importance of controlling blood sugar levels and blood pressure, alongside educating patients on managing their condition. However, several limitations were noted. The cross-sectional nature of the research restricted the ability to establish causality between DM duration and the severity of complications. Future longitudinal studies could provide deeper insights into the progression of these complications over time. Expanding the demographic and geographic diversity of the study population could also enhance the generalizability of the findings.

Strengths of the study included a robust sample size and comprehensive data collection methods that ensured a detailed analysis of complications and comorbidities. However, the study's design and sampling method may have introduced selection bias, and the reliance on self-reported data could have led to information bias. Recommendations for practice included increased screening for microvascular complications and more rigorous public health initiatives to educate patients on the importance of lifestyle modifications in managing their condition.

CONCLUSION

In conclusion, the study indicated that longer durations of Diabetes Mellitus were associated with higher incidences of microalbuminuria, proteinuria, and other diabetes-related symptoms and comorbidities. These results underscored the critical need for stringent glycemic control, effective blood pressure management, and comprehensive patient education to mitigate the progression of complications. Enhancing these facets of diabetes care could significantly improve patient outcomes and reduce the healthcare burden associated with the chronic and progressive complications of diabetes. This approach not only supported individual patient health but also had broader implications for public health policy and resource allocation within healthcare systems.

REFERENCES

1. Azeem S, Khan U, Liaquat A. The Increasing Rate of Diabetes in Pakistan: A Silent Killer. Ann Med Surg. 2022 Jul;79.
2. Nasir M, Razzaque R, Afzal S. Epidemiology of Diabetes Mellitus, Pre-Diabetes, Undiagnosed and Uncontrolled Diabetes in Pakistan.
3. Bakri HM, Alahmadi FM, Taiyeb AM, Khairallah HH, Andijani AM, Yaghmour KA. The Effect of Family Support, Knowledge, and Socioeconomic Status in Controlling Diabetes and Its Complications on the Patient. Middle East J Fam Med. 2022;7(10):89.
4. IDF Diabetes Atlas. 9th edition [Internet]. [cited 2022 Apr 5]. Available from: https://diabetesatlas.org/atlas/ninth-edition/.
5. Nasir M, Razzaque R, Afzal S. Epidemiology of Diabetes Mellitus, Pre-Diabetes, Undiagnosed and Uncontrolled Diabetes in Pakistan.
6. Meo SA, Zia I, Bukhari IA, Arain SA. Type 2 Diabetes Mellitus in Pakistan: Current Prevalence and Future Forecast. J Pak Med Assoc. 2016 Dec 1;66(12):1637-42.
7. Yang JJ, Yu D, Wen W, Saito E, Rahman S, Shu XO, et al. Association of Diabetes with All-Cause and Cause-Specific Mortality in Asia: A Pooled Analysis of More than 1 Million Participants. JAMA Netw Open. 2019 Apr 5;2(4):e192696.
8. Liu Z, Fu C, Wang W, Xu B. Prevalence of Chronic Complications of Type 2 Diabetes Mellitus in Outpatients - A Cross-Sectional Hospital Based Survey in Urban China. Health Qual Life Outcomes. 2010 Dec;8(1):1-9.
9. Lam NN, Quinn RR, Clarke A, Al-Wahsh H, Knoll GA, Tibbles LA, et al. Progression of Kidney Disease in Kidney Transplant Recipients with a Failing Graft: A Matched Cohort Study. Can J Kidney Health Dis. 2023 May;10:20543581231177203.
10. Tutan D, Doğan M. Evaluation of Neutrophil/Lymphocyte Ratio, Low-Density Lipoprotein/Albumin Ratio, and Red Cell Distribution Width/Albumin Ratio in the Estimation of Proteinuria in Uncontrolled Diabetic Patients. Cureus. 2023 Aug 31;15(8).
11. Lu H, Cao Y, Duan P, Wu Y. Microalbumin and Diabetes Mellitus Type 2 (T2DM): A Mendelian Randomization Study.
12. Tao J, Sang D, Zhen L, Zhang X, Li Y, Wang G, et al. Elevated Urine Albumin-to-Creatinine Ratio Increases the Risk of New-Onset Heart Failure in Patients with Type 2 Diabetes. Cardiovasc Diabetol. 2023 Dec;22(1):1.
13. Pradana FJ, Tuba S. Novel Diabetic Nephropathy-Based Hypertension Treatment for Type-2 Diabetes Mellitus and CKD Patients: A Mini Review. J Med Health Stud. 2023 Aug 13;4(4):197-201.
14. Wang G, Liu X, Ying Z, Yang G, Chen Z, Liu Z, et al. Optimized Glycemic Control of Type 2 Diabetes with Reinforcement Learning: A Proof-of-Concept Trial. Nature Med. 2023 Sep 14:1-0.
15. Khan G, Khan IA, Khan FA, Farhan S, Kamran J, Janjua AF, et al. In-Hospital Early Complications in Diabetics Vs Non-Diabetics with Acute ST Elevation Myocardial Infarction Age Group 30-70 Years. PAFMJ [Internet]. 2021 Jan 5 [cited 2023 Oct 31];70(Suppl-4):S576-80. Available from: https://www.pafmj.org/PAFMJ/article/view/6023
16. Timmer JR, Ottervanger JP, de Boer MJ, Boersma E, Grines CL, Westerhout CM, et al. Primary Percutaneous Coronary Intervention Compared with Fibrinolysis for Myocardial Infarction in Diabetes Mellitus: Results from the Primary Coronary Angioplasty vs Thrombolysis–2 Trial. Arch Intern Med. 2007 Jul 9;167(13):1353-9.
17. Hafeez M, Siddiqi AH, Ahmed I. Diabetes Mellitus in Soldiers, What's New: Diabetes Mellitus in Soldiers. PAFMJ [Internet]. 2018 Aug 31 [cited 2023 Oct 31];68(4):779-83. Available from: https://www.pafmj.org/PAFMJ/article/view/74
18. Ali G, Kamran MA, Amir M, Mumtaz B, Khan I, Tariq M. Frequency of Hyperuricemia in Type-2 Diabetes Mellitus and Its Relation with Diabetic Nephropathy. PAFMJ [Internet]. 2023 Feb 28 [cited 2023 Oct 31];73(1):199-203. Available from: https://www.pafmj.org/PAFMJ/article/view/3916
19. Khan A, Rauf A, Khan S, Sarfraz MH, Tarrar MS, Nisar M. Coagulation Profile in Diabetes and Its Association with Diabetic Microvascular Complications.

PAFMJ [Internet]. 2023 Feb 24 [cited 2023 Oct 31];73(1):135-38. Available from: https://www.pafmj.org/PAFMJ/article/view/8260

20. Agarwal C, Bansal K, Pujani M, Singh K, Chauhan V, Rana D, et al. Association of Coagulation Profile with Microvascular Complications and Glycemic Control in Type 2 Diabetes Mellitus - A Study at a Tertiary Care Center in Delhi. Hematol Transfus Cell Ther. 2019 Apr 15;41:31-6.

21. Ali A, Abbasi AS, Nisar A. Progression of Albuminuria and Retinopathy with Duration of Diabetes Mellitus: Albuminuria and Retinopathy. PAFMJ [Internet]. 2018 Aug 31 [cited 2023 Oct 31];68(4):767-72. Available from: https://www.pafmj.org/PAFMJ/article/view/72