

## Common Sleep Disorders among Patients Attending Babylon Dialysis Center

Waleed Azeez Al-Ameedy

Psychiatrist, College of Medicine ,Babylon University

[wam.psych@yahoo.com](mailto:wam.psych@yahoo.com)

### Abstract

**Background :** Many patients with renal failure are complaining from sleep disorders specially those who undergoing hemodialysis. Insomnia , restless leg syndrome(RLS) ,excessive daytime sleepiness and sleep related breathing disorders are the most frequently reported sleep disorders.

**Objectives:** To investigate the proportion of common sleep disorders among uremic patients.

**Method:** This is a hospital based cross sectional study was carried out in Merjan Teaching Hospital during the period February 2015 to April 2015.

Eighty eight uremic patients (51 males and 37 females) admitted to dialysis center for hemodialysis and who fulfilled the inclusion criteria of the study , were enrolled for the study. Information about socio-demographic characteristics (age , gender , occupation , marital status and education ) were collected. Sleep disorders were diagnosed by using specific questionnaire for each disorder.

**Results :** 66% of uremic patients were complaining from sleep disorders and 82.8% of them were above 60 years old. The commonest sleep disorder was insomnia ( 48.3%). There was significant association between presence of sleep disorders and the age of the patients and their body mass index.

**Conclusion :** The present study highlighted the importance of diagnosis sleep disorders among patients with renal failure undergoing hemodialysis because of their adverse impact on the mental and physical health of the uremic patients.

**Key words:** sleep disorders , uremia , hemodialysis.

### الخلاصة

**المقدمة:** العديد من مرضى الفشل الكلوي الخاضعين لعلاج الغسل الدموي يشكون من اضطرابات النوم. الارق , متلازمة الساق الفلقة , الافراط في النوم خلال النهار و اضطرابات التنفس اثناء النوم هي من اكثر اضطرابات النوم المسجلة. **الأهداف:** لتحري نسبة اضطرابات النوم الشائعة بين مرضى الفشل الكلوي.

**الطريقة:** دراسة مقطعية نفذت في مركز بابل للغسل الكلوي في مستشفى مرجان التعليمي خلال الفترة من شباط 2015 الى نيسان 2015 . ثمانية وثمانون مريض (51 من الذكور و 37 من الاناث) المشمولين بمعايير ادراج الدراسة تمت دراستهم. تم جمع معلومات حول الخصائص الاجتماعية والسكانية (العمر, الجنس, الحالة الزوجية, العمل والمستوى التعليمي) . اضطرابات النوم شخصت حسب مقاييس خاصة لكل حالة.

**النتائج:** 66% من مرضى الفشل الكلوي كانوا يشكون من اضطرابات النوم و 82,8% منهم كانت اعمارهم فوق 60 سنة. الارق كان الاكثر شيوعا بين المرضى من بين بقية اضطرابات النوم (48,3%). كان هناك ارتباط بشكل ملحوظ بين وجود اضطرابات النوم وعمر المرضى و دليل كتلة الجسم.

**الاستنتاج:** ابرزت الدراسة اهمية تشخيص اضطرابات النوم بين المرضى الخاضعين لعلاج الغسل الدموي بسبب تأثيرها الضار على الصحة العقلية والجسدية على المرضى المصابين بالفشل الكلوي.

**الكلمات المفتاحية:** اضطرابات النوم , الفشل الكلوي , الغسل الدموي.

### Introduction

Many patients with renal failure are complaining from sleep disorders specially those who undergoing hemodialysis. Insomnia, restless leg syndrome(RLS), sleep related breathing disorders and excessive daytime sleepiness are the most frequently reported sleep disorders.

Renal failure occurs when kidneys are unable to remove waste products, preserve fluid balance and control serum electrolytes. Acute renal failure characterized by rapid and progressive loss of renal function and usually the patient presented with decreased urine production (oliguria, urine output less than 400 ml/day)[Klahr S

1998]. In chronic renal failure , the symptoms can develop slowly and the patient may not notice the symptoms as they occur. Renal failure associated with obvious symptoms is termed uremia [National Kidney Foundation 2002; Per Ginsted 2005]. Studies of uremic patients undergoing hemodialysis have found that 50 – 80% of them experienced some sleep complaints [Unruh, 2003]. Insomnia usually diagnosed by using information from patient`s history, it is a common sleep disorder among general population and the prevalence is markedly increase in dialysis patients (range from 45 – 59%) [Leger, 2000]. Insomnia is associated with significant impairment in sense of wellbeing and the quality of life leading to personal distress, adverse social and economic burden [Iliescu, 2004]. Restless leg syndrome (RLS) is one of leading causes of insomnia and is characterized by irresistible urge to move occurring during night [Trenkwalder, 2009]. Iron deficiency anemia , neurological disorders and calcium/phosphate imbalance are the main potential risk factors for RLS [Gigli, 2004].

Sleep apnea is one of sleep disordered breathing. Accumulation of toxic products and electrolyte disturbance have been suggested to explain the pathophysiology of sleep apnea in uremic patients[Soreide 1991]. Sleep related breathing disorders cause daytime headache , dizziness and excessive daytime sleepiness which may lead to impairment in quality of life and risky driving in uremic patients on dialysis [Shayamsunder, 2005]. It has been linked with increased risk of hypertension and cardiovascular diseases among hemodialysis patients[Zoccali, 2003]. Continuous positive airway pressure (CPAP) is the main line of treatment of sleep apnea [Hanly, 2004]. 52 – 67% of patients with renal failure have problem of reversal of day/night sleep which is the best explanation of excessive daytime sleepiness in those patients [Hughes, 1980].

Sleep deprivation in uremic patients undergoing dialysis has been implicated as a cause of declining the higher-ordered cognitive functions , decrease in immune system , decrease release of growth hormone and increased heart rate variability[Moldofsky, 1995; Gomes, 2011].

### **Aim of the study**

To investigate the proportion of common sleep disorders among uremic patients.

### **Patients and method**

This is a hospital based cross sectional study was carried out in Merjan Teaching Hospital during the period February 2015 to April 2015.

Eighty eight uremic patients (51 males and 37 females) admitted to dialysis center for hemodialysis and who fulfilled the inclusion criteria of the study , were enrolled for the study. Patients have been seen once weekly during the period of the study. Informed consent was taken from each patient before collection of data. Ability to participate and hemodialysis for more than 6 months were the inclusion criteria while patients who have history of mental illness or cognitive dysfunction were excluded.

Tools of the study : informations about socio-demographic characteristics (age, gender, occupation, marital status and education) were collected. Data regarding past medical history, smoking, body mass index, time and duration of hemodialysis were also included in our questionnaire. To diagnose sleep disorders the following tools were used (in addition to clinical interview and history taking):

- International classification of sleep disorders (ICSD-2) definition was used to diagnose insomnia.
- International restless leg syndrome study group for the clinical diagnosis of restless leg syndrome.
- Epworth sleeping scale(ESS) to assess excessive daytime sleepiness.
- Berlin questionnaire to assess the risk of obstructive sleep apnea.

Data analysis : Statistical analysis was carried out using SPSS version 18. Categorical variables were presented as frequencies and percentages. Continuous variables were presented as means with their 95% confidence interval (CI). The Pearson's chi-square test ( $\chi^2$ ) was used to determine the associations between categorical variables. A p-value of  $< 0.05$  was considered as statistically significant.

## Result

The present study shows that the majority of our patients (66%) are complaining from sleep disorders. Figure (1) shows the proportion of sleep disorders according to age. 82.8% of uremic patients who are complaining from sleep disorders aged more than 60 years. The proportion of female patients was 58.6% among patients with sleep disorder (figure 2). Insomnia was the commonest sleep disorder (48.3%) among patients with renal failure while the proportion of restless leg syndrome , excessive daytime sleepiness and sleep related breathing disorders were 25.8% , 13.8% and 12.1% respectively (figure 3). The association between sleep disorders and the age , marital status , education and occupation of uremic patients was shown in table (1). There was significant association between sleep disorders and the age of the patients. 89.7% of uremic patients with sleep disorders have history of chronic diseases like diabetes mellitus and hypertension. A significant association was found between presence of sleep disorders and body mass index of the patients( table 2).

Table 3 shows the association between the presence of sleep disorders according to time and duration of dialysis. 55.2% of uremic patients with sleep disorders were undergoing hemodialysis at the morning shift while 51.7% of patients who complaining from sleep disorders have hemodialysis duration for more than 1 year duration.

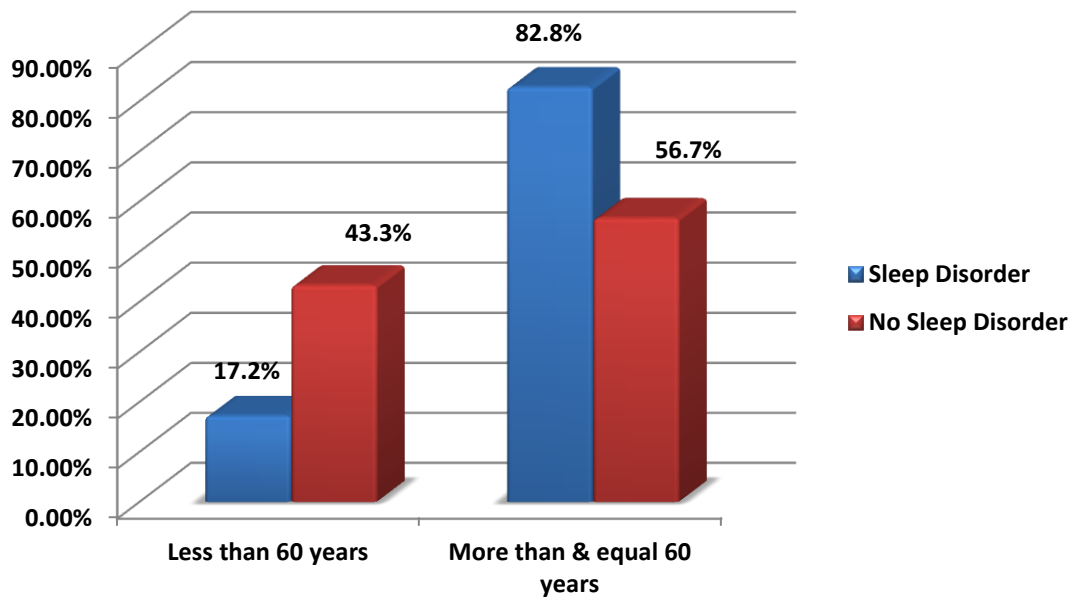


Figure 1 : The distribution of sleep disorders according to age.

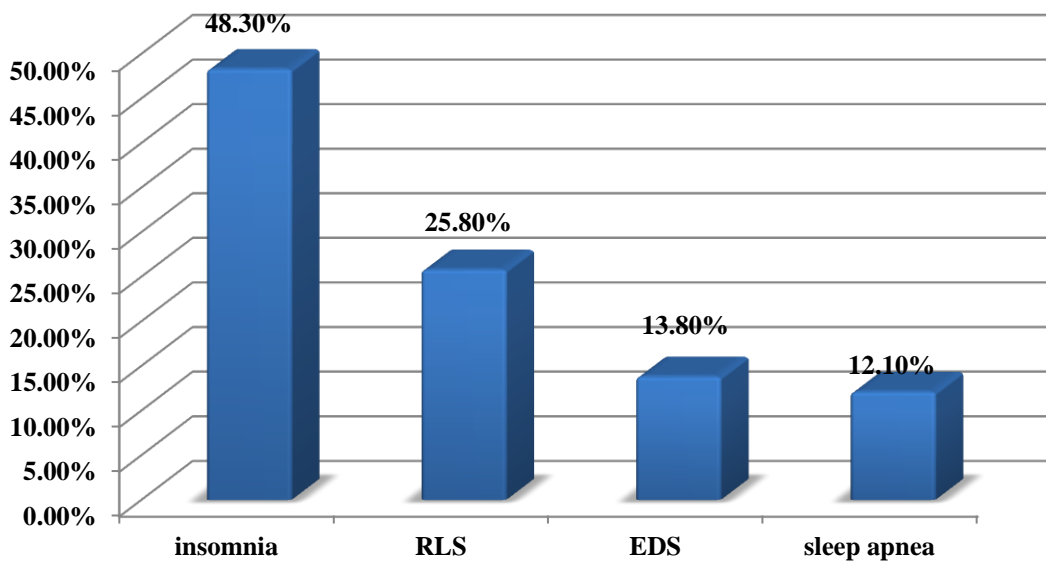
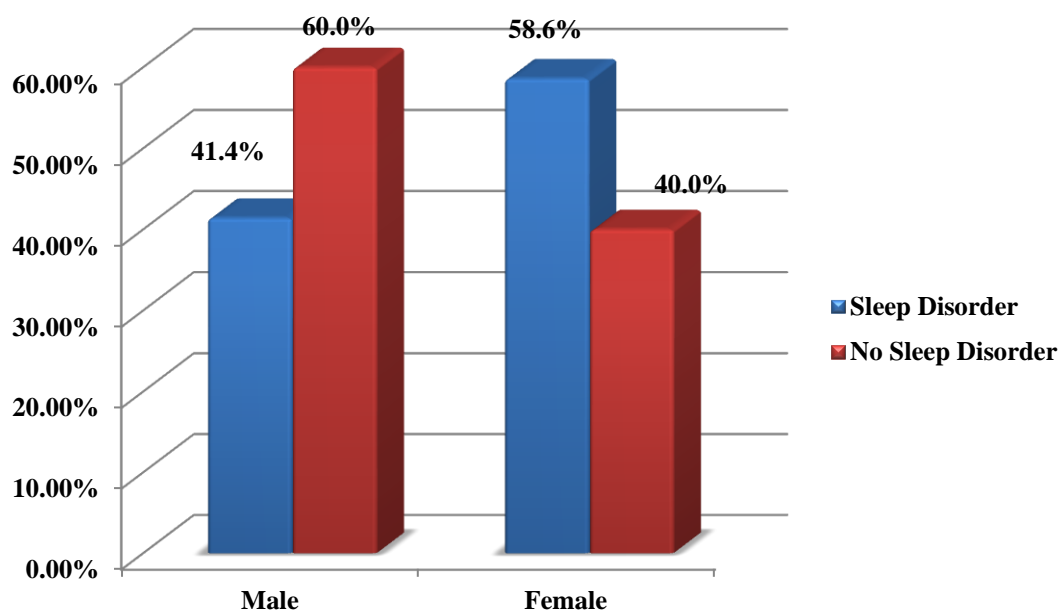


Figure 2: The distribution of sleep disorders according to gender of the patients.



**Figure 3 : The Distribution of each sleep disorder among uremic patients.( RLS : restless leg syndrome , EDS : excessive daytime sleepiness)**

**Table 1: Association between sleep disorders with patient`s socio-demographic characteristics**

Variable	Sleep disorders		$\chi^2$	P values
	Yes (%)	No (%)		
Age group < 60 years ≥ 60 years	10 (17.2) 48 (82.8)	13 (43.3) 17 (56.7)	6.973	<b>0.008*</b>
Sex Male Female	24 (41.4) 34 (58.6)	18 (60.0) 12 (40.0)	2.748	0.097
Marital status Single Married Widow	3 (5.2) 54 (93.1) 1 (1.7)	4 (13.3) 25 (83.3) 1 (3.3)	2.091	0.352
Educational status Illiterate Primary school Secondary school University	22 (37.9) 26 (44.8) 8 (13.8) 2 (3.5)	12 (40.0) 9 (30.0) 7 (23.3) 2 (6.7)	2.621	0.454
Occupational status Unemployed Employed	48 (82.8) 10 (17.2)	26 (86.7) 4 (13.3)	0.226	0.635

\* Significance level p value < 0.05

**Table 2: Association between sleep disorders and patient's past-medical history , smoking status and body mass index(BMI)**

Variable	Sleep Disorders		$\chi^2$	P values
	Yes (%)	No (%)		
Past-medical history				
No history of previous chronic diseases.	6 (10.3)	4 (13.3)	0.175	0.675
History of chronic diseases.	52 (89.7)	26 (86.7)		
Smoking status				
Non- smoker	46 (79.3)	26 (86.7)	0.719	0.396
Smoker	12 (20.7)	4 (13.3)		
BMI				
Normal weight	15 (25.9)	13 (43.3)	12.217	<b>0.002*</b>
Overweight	11 (19.0)	12 (40.0)		
Obese	32 (55.2)	5 (16.7)		

\* Significance level p value &lt; 0.05

**Table 3: Association between sleep disorders with time and duration of dialysis**

Variable	Sleep Disorders		$\chi^2$	P values
	Yes (%)	No (%)		
Time of dialysis				
Morning	32 (55.2)	21 (70.0)	3.788	0.150
afternoon	16 (27.6)	8 (26.7)		
Evening	10 (17.2)	1 (3.3)		
Duration of dialysis				
6 months- 1 year	28 (48.3)	17 (56.7)	0.557	0.455
More than 1 year	30 (51.7)	13 (43.3)		

\* Significance level p value &lt; 0.05

## Discussion

Sleep disorders are common among patients with chronic illness especially renal failure. The result in this study shows high prevalence of sleep complaints among this specific population , 58 patients are complaining from sleep disorders (about 66% in our sample), and the elderly patients were suffering more than other age groups from poor sleep (their proportion was 82.8% of those patients with sleep disorders). Female patients in our study are reported sleep disorders more than male patients (58.6% of uremic patients with sleep complaint were females). These results are compared with a research study done by Sabbatini et al [Sabbatini M 2002] who is reported a higher proportion of insomnia and other sleep disorders among females and elderly patients. Decreased in total night sleep, frequent nighttime awakening and

other sleep changes of elderly may also contribute to the complaint of sleep disturbance among old aged uremic patients.

Insomnia was the commonest complaint in our study (48.3 %) and this proportion lower than the finding of Al-Jihadi et al [Al-Jahdali et al 2010]. 25.8% of patients were complaining from restless leg syndrome (RLS). Most of our patients in the present study were receiving erythropoietin medication and iron supply to manage iron deficiency anemia and RLS and this may explain the lower proportion of this syndrome in our sample when compared with other studies [Al-Jahdali *et al.*, 2010; Farzaneh Chavoshi 2015]. By using the Epworth Sleepiness Scale (ESS), 13.8% of uremic patients are very sleepy during daytime. The metabolic disturbance of uremia and the impairment in the sleep efficiency during night have been suggested as a predisposing factors of excessive daytime sleepiness.

12.1% of uremic patients undergoing hemodialysis in our study were at high risk of sleep apnea. Another study in Italy found that about 24% of uremic patients classified as having high risk of sleep apnea [Merlino, 2006]. Most of our patients who are at risk of sleep apnea (obese patients, old age or have history of chronic diseases) undergoing nocturnal hemodialysis which may lessen the severity of sleep related breathing disorders.

52 patients out of 58 patients (89.7%) in the present study have previous history of chronic diseases (mainly diabetes mellitus and hypertension) in association with presence of sleep disorders. The symptoms and complications of such chronic diseases may also interfere with the normal sleep of uremic patients. We reported a significant association between sleep disorders and body mass index (BMI). 55.2% of our patients who have sleep disorders are obese. The problems of overweight may contribute to the pathophysiology of sleep apnea and other sleep disorders. Many cultural factors in our society make the overweight and its adverse consequences more prevalent especially the unhealthy eating habits with sedentary life style.

55.2% of patients who have sleep disturbance were undergoing hemodialysis at the morning shift , a result that is concordant with the other study [Sabbatini M 2002]. No significant relation found between sleep disorders and the duration of hemodialysis , Sabbatini et al [Sabbatini, 2002] reported an association between longer duration of hemodialysis and presence of sleep complaints.

The importance of this study comes from the fact that many uremic patients undergoing hemodialysis suffering from poor sleep quality and to our knowledge this research was the first study which done to investigate that problems in our patients, so our results should be considered by the nephrologists in Babylon Dialysis Center to recognize and treat the underlying causes of sleep disorders.

Other studies needed to include large number of patients and to investigate the proportion of other important sleep disorders like narcolepsy, bruxism and somnambulism.

## References

- Al-Jahdali et al. Insomnia in chronic renal patients on dialysis in Saudi Arabia. *Journal of Circadian Rhythms* 2010, 8:7.
- Dr Per Grinsted . "Kidney failure (renal failure with uremia, or azotaemia)".2005
- Farzaneh Chavoshi ; Behzad Einollahi: Prevalence and Sleep Related Disorders of Restless Leg Syndrome in Hemodialysis Patients. *Nephro Urol Mon.* 2015 March; 7(2): e24611.
- Gigli GL, Adorati M, Dolso P et al. Restless legs syndrome in end-stage renal disease. *Sleep Med* 2004; 5: 309–315.

- Gomes AA, Tavares J, de Azevedo MH. Sleep and Academic Performance in Undergraduates: A Multi-measure, Multi-predictor Approach. *Chronobiol Int.* Nov 2011; 28(9):786-801
- Hanly P. Sleep apnea and daytime sleepiness in end-stage renal disease. *Semin Dial* 2004; 17: 109–114.
- Hughes JR. Correlations between EEG and chemical changes in uremia. *Electroencephalogr Clin Neurophysiol* 1980; 48: 583–594.
- Iliescu EA, Yeates KE, Holland DC: Quality of sleep in patients with chronic kidney disease. *Nephrol Dial Transplant* 2004, 19(1):95-9
- Klahr S, Miller S. "Acute oliguria". *N Engl J Med* 338.1998(10): 671–5
- Leger D, Guilleminault C, Dreyfus JP, Delahaye C, Paillard M: Prevalence of insomnia in a survey of 12,778 adults in France. *J Sleep Res* 2000, 9 (1): 35-42
- Merlino G. et al.: Sleep disorders in patients with end-stage renal disease undergoing dialysis therapy. *Nephrol Dial Transplant* (2006) 21: 184–190.
- Moldofsky H. Sleep and the immune system. *Int J Immunopharmacol.* Aug 1995; 17 (8): 649-54.
- National Kidney Foundation. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *Am J Kidney Dis.* 2002; 39 (2 Suppl 1) : S1-266.
- Sabbatini M, Minale B, Crispo A *et al.* Insomnia in maintenance haemodialysis patients . *Nephrol Dial Transplant* 2002 ; 17: 852-856.
- Shayamsunder AK, Patel SS, Jain V, Peterson RA, Kimmel PL. Sleepiness, sleeplessness, and pain in end-stage renal disease: distressing symptoms for patients. *Semin Dial* 2005; 18 : 109-18.
- Soreide E, Skeie B, Kirvela O *et al.* Branched-chain amino acid in chronic renal failure patients: respiratory and sleep effects. *Kidney Int* 1991; 40: 539–543.
- Trenkwalder C, H gl B, Winkelmann J. Recent advances in the diagnosis, genetics and treatment of restless legs syndrome. *J Neurol* 2009; 256: 539–53.
- Unruh M, Hartunian M, Chapman M, Jaber BL. Sleep quality and clinical correlates in patients on maintenance hemodialysis. *Clin Nephrol.* 2003;5 9 (4): 280-288.
- Zoccali C, Mallamaci F, Tripepi G. Traditional and emerging cardiovascular risk factors in end-stage renal disease. *Kidney Int* 2003; 85 (Suppl) : S105-10.