Original Article

Quality of Sleep Among the Patients of Congestive Cardiac Failure and Factors Associated with Poor Sleep Quality

Syeda Misbah Batool[1], Ayesha Shafqat[1], Mohammad Fareed Khan[2], Usama Bin Zubair[4], Syed Azhar Ali[3] and Hamza Bin Zubair[5]

ABSTRACT

Objective: To assess the quality of sleep in patients of congestive cardiac failure (CCF) and analyze the factors which can cause sleep disturbances.

Study Design: Cross sectional (correlational) study

Place and Duration of Study: This study was conducted at the cross sectional research was done at CMH Rawalakot from 1st January to 31st March 2018.

Materials and Methods: The study subjects consisted of CCF patients with New York Heart Association Class III or IV. Sleep disturbance was analysed through Pittsburgh Sleep Quality Index (PSQI). Association of gender, age, smoking, duration of illness and body mass index were assessed with sleep disturbances.

Results: Two hundred and sixty patients of CCF with NYHAC III or IV were included in the final analysis. 145 (55.7%) were male and 115 (44.3%) were female. Out of them, 117 (45%) had healthy sleep while 143(55%) had sleep disturbances at HA. After applying logistic regression we found that high BMI and long duration of illness was significantly associated with poor sleeping routines in patients with CCF.

Conclusion: Sleep disturbances were a commonly found in patients suffering from congestive cardiac failure. Patients with high Body mass index and chronic illness were at higher risk of having sleep problems as compared to other patients.

Key Words: Quality of Sleep, Congestive Cardiac Failure, Sleep Quality.

INTRODUCTION

Congestive Cardiac Failure (CCF) is characterized by the inability of the heart to pump an adequate amount of blood to achieve the demands of the different organ systems. It is a chronic disease with poor outcome if not treated adequately in time. There is a worldwide rise in the prevalence of CCF in the past few years.[1,2] More than five million people are suffering from this condition in the US.[1]Situation in our part of the world is not different, rather worse.

[1.] Department of Physiology, Al Nafees Medical College Islamabad.

[2.] Department of Cardiology / Psychiatry[3], Poonch Medical College Rawalakot.

[4.] Department of Psychiatry, Mater Misericordiae University Hospital Dublin Ireland.

[5.] Holy family Hospital Rawalpindi.

Correspondence: Syeda Misbah Batool, Senior Lecturer, Physiology, Al Nafees Medical College Islamabad.
Contact No: 03331524917
Email: dr.misbah83@gmail.com

Prevalence of CCF in Pakistan is found to be is 14.75% - 22.87% causing dramatic increase in hospitalization and increased stress on the health resources.[3]

Normal sleep is necessary for the maintenance of homeostasis. All chronic diseases affect the body physiology one way or another, influencing the sleep also.[4,5] Previous research highlights both the objective and subjective components of the sleep disturbances among the patients of CCF. 79% of the CCF patients had poor sleep quality in a study done in Iran.[6] Another similar study done in Brazil showed that 68.5% of the CCF patients had poor sleep with female predominance.[7] Sharma et al. concluded that sleep disorders and sleep disordered breathing is common among the patients of CCF. Patients of CCF have increased peripheral and central chemoresponsiveness which promotes hyperventilation and hypocapnia leading to chronicrespiratory alkalosis. Another important factor contributing to chronichyperventilation is pulmonary vagalirritant receptors timulatio by pulmonary venous congestion. These factors lead to the breathing problems during sleep making the sleep quality poor.[8] Sleep canal so be affected by the mental health issues encountered commonly in chronic diseases.[9,10]

Various local and foreign studies have concluded increased prevalence of anxiety and depression among

patients of CCFl eading to sleep disturbances.[11,12]

Sleep patterns if remain isturbed for more than 24 hours canmodulate mood and cognition of an individual.[13] Improvement in functional performance, mental health and quality of life among patients of CCF hasal so been associated with good quality of sleep in various studies done in the past.[14,15]

A number of recent studies mention effects of factors like Female gender, low socioeconomic status, increasing age, presence of non cardiac co morbidities,6 breathing difficulties and nocturia7on quality of sleep in patients with CCF. These specific factors effect the sleep by changing mechanical physiological psychological as well as social domains of daily life.

The research rationale examines the general characteristic of sleep in the patients suffering from CCF and its associated factors.

MATERIALS AND METHODS

From 1st January to 31st march 2018 after the consent of Ethical Review Committee this cross sectional research was done at CMH Rawalakot. Informed consent acquired from the patients included in the study. Sample size was calculated by applying WHO Calculator by using population prevalence proportion of 79%.6All patients more than 18 years of age with diagnosis of CCF by Framingham criteria for CCF and NYHA class III or IV had also been included in the research. And those patients who refused to participate or those with age less than 18 or those with NYHA class I or II were excluded from the study. Patients with psychiatric illness and substance abuse were excluded from the study. Patients with severe debilitating diseases like CRF, CLD or malignancies or those with an invasive procedure done in last six months or those who were failed to comprehend the PSQI had also been excluded. After applying the inclusion and exclusion criterion, 260 patients were assessed

Description of Instrument: Different methods and questionnaires are used for assessment of quality of sleep. To measure the quality of sleep we used questionnaire as well as description of instrument. We used Pittsburgh Sleep Quality Index (PSQI) which is most commonly used. The PSQI is a useful tool to quantify the subjective Validated Urdu version of PSQI was applied[16]. Sleep disturbance is showed by the global sum of "5" or more.

Procedure: The consenting subjects were provided with a detailed description of the study. Confounding variables were taken care of by detailed history taking about any current or previous physical or psychiatric illness and any current or previous evidence of illicit substance / drug use. Those subjects with confounding variables were excluded from the study. The PSQI questionnaire was administered to the subjects and were asked to answer the questions according to their condition in last one month.

The study parameters included age, gender, smoking, Duration of illness and BMI. 1 exceeding to 60 years was considered as high risk. The history of smoking was acquired people who were found saying "Yes" to the questions like "Do you smoke" or "Have you smoked tobacco products regularly, in other words, daily or nearly daily?" were defined as smokers. Overweight is defined as BMI of 24 or more6. Socio demographic details of subjects were obtained through structured Performa. Descriptive statistics applied to obtain analysis of characteristics of subjects and PSQI score distribution. On the basis of results subjects were catagorised by comparing good vs poor sleep quality.

Statisticalanalysis: Characteristics of participants and the distribution of the PSQI score were described by using the descriptive statistics. Participants were resulted by categorical compared by good vs poor sleep quality. Group variances in categorical correlates were assessed by Chi-square. Correlated factors were analysed by binary logistic regression. Data was analysed on Statistics Package for Social Sciences Version 20.0. usage of Chi-square was to determine the differences between groups. If p values were less than are equal to 0.05, differences were considered significant.

RESULTS

All the patients who reported with stage III or IV congestive cardiac failure were approached to participate

Table No.1: Factors associated with sleep disturbance.

Sociodemo graphic factors Total	Subjects with good sleepquality (PSQI-0-4)	Subjects with poor sleep quality (PSQI-5 ormore)	p-value
Age 60 or less>60	83(70.9%) 34(29.1%)	88(61.5%) 55(38.5%)	0.111
Gender Male Female	60(51.3%) 57(48.7%)	85(59.5%) 58(40.5%)	0.188
Duration of Illness <12 months 12 or more months	96(82.1%) 21(17.9%)	94(65.7%) 49(34.3%)	0.003
Tobacco smoking Non Smoker Smoker	68(58.1%) 49(41.9%)	85(59.5%) 58(40.5%)	0.830
BMI<25 25 or more	67(57.2%) 50(42.8%)	58(40.5%) 85(59.5%)	0.007

Table No.2: The correlated factors relating to quality of sleep: the binary logistic regression

	p-value	Oddsratio	95% Confidenceinterval	
			lower	upper
Age (ref. is <60 years)	0.108	1.572	0.906	2.728
Gender (ref. is male gender)	0.056	0.597	0.352	1.013
Duration of Illness (ref.is<12months)	0.007	2.290	1.256	4.178
Smoking (ref. is non smoker)	0.664	0.891	0.530	1.499
BMI (ref.is<25)	0.014	1.920	1.142	3.230

in the study but after the application of criteria laid down in the start, 260 participants had completion of the PSQI.

Mean age of the study participants was. .145 (55.7%) were male and 115 (44.3%) were female. 117 i.e. (45%) of them were found to have healthy sleep while 143 i.e. 55% had been found with sleep disturbances. As shown in table 1 extended period of illness and high BMI had significant association with poor sleep quality when chi-square was applied. Table 2 shows that these parameters of long duration of illness and BMI were strongly associated with sleep disturbances on application of regression analysis while advancing age, smoking and gender had no such association on statistical analysis.

DISCUSSION

Psychiatric morbidity and disturbed sleep has been annexed with patients suffering from CCF. In multiple research works 11 Results of PSQI showed that 55% subjects of our sample size had sleep disturbances, which is endorsed by many studies done in different parts of the world.[5,11,17,18] Disturbed breathing patterns, nocturia, use of medications and psychological issues are known to influence sleep patterns among CCF patients.[19,20] Reason behind these may be related to nocturnal hypoxemia i-e. abnormally low concentration of oxygen in the blood during the night[19, 21] or mental health issues as a result chronic nature of disease.[10, 11, 12] Psychiatric disorders were found in patients of CCF is supported by local as well as foreign data.[11,12] Sleep disturbances and psychiatric problems have a strong correlation.[22] The Vicious cycle between sleep disturbance and psychiatric manifestations becomes very challenging for the physicians.[24,25] Though scope of our study is not to look for any psychiatric illness it is an established fact by now that these patients are at increased risk of mental health problems.[11,12] Discussion on this aspect is essential because sleep is very complicated brain function having both neurological, physiological as well as psychological and social domains variantly. Azevedo et al. in 2015 did a study on patients suffering from heart failure to correlate quality of sleep and quality of life. A huge number of participants had poor sleep quality and poor sleep quality had a strong relationship with poor quality of life.[15]

Our study did not include the overall or health related quality of life but our results were similar to their results in terms of more than half of the study population have poor quality of sleep on subjective psychometric tool. Chen et al. in 2209 performed a similar study in Taiwan and came up with the findings that people with heart failure 74% self-reported disturbances in sleep were found. Education, NYHA classification, social functioning, physical symptoms and perceived health were five predictors which were identified by applying hierarchical multiple regression analysis, accounting for 26.9% of variance in sleep disturbance.[18] Though less percentage of patients from our sample reported sleep disturbances as compared to participants of Chen et al. but BMI and long duration of illness emerged as strong predictors of poor quality of sleep. Dos Santos et al. in 2012 did a study on patients with heart failure. 17 In current study a non probabilistic sample of 400 patients (mean age 57.8yrs , 64.8% with male gender, avg. education of 6.1 years, 82.5% in functional class II) with CCF are included. Associated main factors with sleep were nocturia, breathing difficulty and interrupted sleep at night. Sleep disturbance in CCF is multifactorial and these problems are linked with sleep disturbance. Nursing interventions are required for most of these disorders. Loaetal. did a relevent work withverylargesamplesizeandinferredthat reduced and unhealthy sleep quality are associated with higher risk of corornary arterydisease however the correlation with long sleep was not found to be statistically significant.[24] This supports our rationale behind this study that in order to prevent progression of underlying cardiac illness and improve overall quality of life, sleep of individuals should be given appropriate importance suffering from congestive cardiac failure. Patients of CCF with high BMI and longer duration of illness were more at a risk of having sleep problems as compared to the other patients.

CONCLUSION

Sleep disturbance with poor quality is a common finding in patients suffering from CCF. High BMI, longer duration of illness were risks of having sleep problems as compared to other patients.

Poor subjective sleep quality was a common finding among the patients suffering from congestive cardiac failure. Patients of CCF with high BMI and longer

duration of illness were more at a risk of having sleep problems as compared to the other patients.

Author's Contribution:

Concept & Design of Study:	Syeda Misbah Batool
Drafting:	Ayesha Shafqat, Mohammad Fareed Khan
Data Analysis:	Usama Bin Zubair, Syed Azhar Ali, Hamza Bin Zubair
Revisiting Critically:	Syeda Misbah Batool, Ayesha Shafqat
Final Approval of version:	Syeda Misbah Batool

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Curtis LH, Whellan et al. Incidence and prevalence of heart failure in elderly persons, 1994–2003. Arch Intern Med 2008;168:418–424.
2. Bui AL, Horwich TB, Fonarow GC. Epidemiology and risk profile of heart failure. Nat Rev Cardiol 2011;8(1):30-41.
3. Lubna N, Yasir A, Sher BK, et al. In patient burden of heart heart disease in the cardiology units of tertiary care hospitals in Peshawar. Pak J Physiol 2012;8(1):1-4.
4. Koyanagi A, Garin N, Olaya B, et al. Chronic Conditions and Sleep Problems among Adults Aged 50 years or over in Nine Countries: A Multi-Country Study. PLoS One 2015;10(9): e0138261.
5. Smagula SF, Koh WP, Wang R, Yuan JM. Chronic disease and lifestyle factors associated with change in sleep duration among older adults in the Singapore Chinese Health Study. J Sleep Research 2016;25(1):57-61.
6. Moradi M, Mehrdad N, Nikpour S, et al. Sleep quality and associated factors among patients with chronic heart failure in Iran. Med J Islam Repub Iran 2014;28:149.eCollection2014.
7. Santos MA, Guedes ES, Barbosa RL, Cruz DALM. Sleeping difficulties reported by patients with heart failure. Rev Latino-Am Enfermagem 2012;20(4):644-50.
8. Sharma B, Owens R, Malhotra A. Sleep in congestive heart failure. Med Clin North Am 2010;94(3):447–464.
9. Ozaki Y, Sposito APB, Bueno DRS, Guariento ME. Depression and chronic diseases in elderly. Rev Soc Bras Clin Med 2015;13(2):149-53.
10. Voinov B, Richie WD, Bailey RK. Depression and chronic diseases: it is time for a synergistic mental heal hand primary care approach. Prim Care Companion. CNS Disord 2013;15(2).
11. Nasir U, Shahid H, Shabbir MO. Sleep quality and depression in hospitalized congestive heart failure patients. J Pak Med Assoc 2015; 65(3):264-269.
12. Cully JA, Jimenez DE, Ledoux TA, et al. Recognition and Treatment of Depression and Anxiety Symptoms in Heart Failure Prim Care Companion. J Clin Psychiatr 2009;11(3): 103–109.
13. V.deAquino Lemos HK, Antunes RV, dos Santos FS, et al. High altitude exposure impairs sleep patterns, mood, and cognitive functions. Psychophysiol 2012;49(9)1298–12306.
14. Redeker NS, Hilkert R. Sleep and quality of life in stable heart failure. J Card Fail 2005; 11(9):700-4.
15. Azavedo I, Vieira EMA, Nato NRO, et al. Correlation between sleep and quality of life in patients with heart failure. Fisioter Pesq 2015; 22(2):148-154.
16. Hashmi AM, KhawajaI S, Butt Z. The Pittsburgh Sleep Quality Index: validation of the Urdu translation. J Coll Physicians Surg Pak 2014; 24(2):123-6.
17. Santos MA, Cruz DALM, Barbosa RL. Factors associated to sleep pattern in heart failure patients. Rev Esc Enferm USP 2011;45(5): 1102-9.
18. Chen HM, Clark AP, Tsai LM, Choa YF. Self-reported sleep disturbance of patients with heart failure in Taiwan. Nurs Res 2009;58(1):63-71.
19. Rao A, Gray D. Impact of heart failure on quality of sleep. Postgrad Med J 2005;81:99-102.
20. Lee KS, Lennie TA, Dunbar SB, et al. Self-reported sleep dysfunction is associated with worse cardiac event-free survival in patients with heart failure. Heart Failure Society of America (HFSA) 2014. Scientific Meeting; September14, 2014; LasVegas,NV.Abstract 115.
21. Mirzaaghazadeh M, Bahtouee M, Mehdiniya F, Maleki N, Tavosi Z. The Relationship between Nocturnal Hypoxemia and Left Ventricular Ejection Fraction in Congestive Heart Failure Patients.Sleep Disorders 2014.
22. Nutt D, Sue Wilson. Sleep disorders a score symptom of depression. Dialogues Clin Neurosci 2008;10(3):329–336.
23. Hall M, Buysse DJ, Nowell PD, et al. Symptoms of stress and depression as correlates of sleep in primary insomnia. Psychosom Med 2000; 62(2):227-30.
24. Lao XQ, Liu X, Deng HB, et al. Sleep Quality, Sleep Duration, and the Risk of Coronary Heart Disease: A Prospective Cohort Study With 60, 586 Adults. J Clin Sleep Med 2018;14(1): 109–117.