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Research Article

Assessment of Sleep Quality in patients with Interstitial Lung disease in Minia University Hospital

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Abstract

Background: It's common for sufferers of interstitial lung diseases to have problems in sleeping. Lack of sleep or poor quality sleep has been associated to an impaired quality of life, an increased risk of death, and even tragedy in children with ILD. **Aim of work:** Consider the Big Picture: Patients at Minia university Hospital who have been diagnosed with interstitial lung diseases will be surveyed to assess their sleep quality. **Patients &methods:** Research Strategies and Human Subjects With a diagnosis of lung disease, 110 patients were recruited between December 2019 and December 2021 at Minia University Hospital's inpatient sector or intense outpatient plan of such chest department. Data gathered comprised demographic boundaries (age, gender, body mass index and occupational history). The pulmonary capacities were evaluated. Patients assessed their own sleep using a quiz (Pittsburgh sleep efficiency score, Epworth Sleepiness Scale, STOP BANG, ESS) to provide feedback on its quality. The subjects were also required to walk during 6 minutes (6-MWT). **Results:** The average age of our sample of 110 patients with ILD was 51.9 ±14.5, but 81.8% were female. There were sixty-three patients (57.2%) who complained about having poor sleep. Both the Epworth sleepiness scale and the mass index showed significantly different distributions across the groups. When comparing the high-quality sleep group to the low-quality sleep group, the high-quality group had significantly higher rates both of BMI and Epworth sleep scale (p0.0001 and p0.02, respectively). **Conclusion:** This means that people with ILD have bad sleep patterns regardless of their health. Concepts like ILD, dyspnea, the Epworth sleepiness level, and the Insomnia severity index are crucial to keep in mind.

Keywords: Parenchymal lung diseases, Pittsburgh sleep quality index, poor sleepiness effect

Introduction

Parenchymal pulmonary disorders with cardio-vascular impairment are common outcomes of interstitial inflammatory lesions called parenchymal lung diseases (DPLD) which have variable effects on the alveolar chamber permeability but rather lung intersti-tium, leading to diffusion impairment[1,2]. Respiratory failure, a poor standard of living, and a 5-year overall survival rate of 20% to 40% have all been linked to fibrotic DPLDs [2], and idiopathic pulmonary fibrosis is one such condition (IPF).

Humans spend around a third of their lives in the normal [3]. Those who suffer from ILD often report feeling exhausted due to the effects of their illness. Sleep disturbances in individuals with ILD are caused by a number of factors, including changes in lung pathophysiology (such as diurnal hypoxemia), abnormalities in sleep pattern, and the presence of co-occurring sleep disorders. The disturbance of sleep due to ILD might have other negative consequences, such as a worse quality of sleep and excessive daytime sleepiness[4]. A patient's health and capacity to recover from sickness depend

critically on the quality of sleep they get. Pain[5] is just one example of the many health problems that have been linked to disturbed sleep, which may have negative effects on one's emotional and physical well-being. Sleep deprivation has

immediate consequences such as an amplified stress response, anxiety, psychological discomfort, mood disorders, and deficits in cognition, memory, including performance [6].

Obstructive sleep apnea, apnea hyponea index (AHI) is higher than normal, low oxygen saturation index have all been linked to ILD (typically IPF) in a large number of people. Breathing issues and daytime tiredness are associated with poor sleep quality with disrupted circadian rhythms [8].

Aim of the study

Assessment the sleep experiences and disturbance in people at Minia Teaching Hospital who have been diagnosed with interstitial lung diseases.

Patients and Methods

Between December 2019 until December 2021, researchers from the Thoracic Department rather than health center at Minia Surgical and Medical University Clinic performed a cross-sectional experiment.

Patients were eligible for inclusion if they had illnesses that impacted the whole lung parenchyma.

Infection with the Covid-19 virus is not acceptable.

Methods: Inclusion criteria for the research were that clinical history, physical examination, increased computed tomography (HRCT) of the thorax, and a collagen profiles all indicate to the existence of ILD in the patient. BMI, neck circumference, smoking status, and spirometry results were collected in addition to the ages and sexes.

The PSQI scale, an internal, validated ten - item checklist, was used to evaluate sleep quality. This tool measures sleep disruption and regular sleep habits over the course of the preceding month. Each of the seven factors is given a score between 0 and 3 [9]: sleep quality, sleep length, habitual efficiency, pharmaceutical usage for initiating sleep, and daytime dysfunction. For the PSQI as a whole, higher scores suggest worse sleep. The PSQI includes self-reported questions on sleep habits such as bedtime and wake-up times.

The Epworth Sleepiness Scale was used to determine how sleepy the participants were throughout the day (ESS). Subjects estimate their propensity to sleep under different circumstances on a scale from 0 (never) to 3 (extremely likely). Every patient was given the STOP BANG questionnaire, which may provide a final score anywhere from 0 to 24 [10]. Snoring, fatigues, observed apnea, diabetes, obesity, height, neck size, the male gender are all factors that should be considered in addition to the results of a regular medical examination. Each question with a "yes" answer receives a score of one, while each question with a "no" answer receives a score of zero. The outcomes might be anything from zero to eight. Those having a body mass index (BMI) above 35, a pectoral circumference (CX) over 40 centimeters, being male, and being older than 52 years old get a score of 1. This group is called the "Bang" category. A low risk of obstructive sleep apnea (OSA) is indicated by a score of 0-2 on the sleepiness scale, an intermediate risk by a score of 3-4, and a high risk by a score of 5 [11].

Statistic evaluation

For statistical analysis, the SPSS for Windows release 10.0 package program was employed. The Chi-square test was used to compare the data among the various variables. The Kaplan Meier method was used to compute the survival analysis. In order to assess mortality factors using univariate and multivariate analyses, a Cox regression was carried out. Statistical significance was defined as p 0.05*.

Results

One hundred and ten individuals with a confirmed ILD diagnosis were enrolled in the study; each patient's illness was identified using standardized criteria and established protocols. The average age was 51, 9 ±14.5 years, and 81.8% were female .

Table 1 shows that out of 110 service users of ILD, 53.63 percent had chronic HP, 14.55 percent had NSIP, 15.3 percent had acute HP, 5.45 percent had UIP-IPF, 3.73 percent had LAM, 2.73 percent had PPFE, 1.91 percent had histocytosis, 2.73 percent had LIP, 2.73 percent had PPFE, and 1.91 percent had sarcoidosis.

Out of 110 patients, 63 (57.4%) reported having subpar sleep as measured by a PSQI total score or above.

Compared to patients with excellent sleep quality, participants with overall bad sleep quality showed more subjective signs of sleepiness with just a higher ESS. (p=0.02 and STOP BANG questionnaire) p 0.001), suggesting a significant distinction among the two groupings in the likelihood of OSA .

Physical and physiological parameters such as age (p=0.1), sex distribution (p=0.7), cigs (p=0.9), dyspnea (p=0.2), respiratory distress degree (p=0.29), spirometry (p=0.06), 6MWT final saturation (p=0.15), forced vo2 max (FVC p=0.3), and forced expiratory volume in 1 second (FEV1 p=0.7) were not significantly different between subject matters with good sleep quality (Table 2 &3).

Table 3 shows the relation between sleep quality with Smoking and Dyspnea, and no discernible differences were between the two groups.

Table 4 show Relation between 2 groups of sleep quality and BMI, Epworth scale and STOP BANG questionnaire, according to the STOP-Bang questionnaire, there was a signifi-cant difference between the two groups in the risk of OSA; respondents with poor sleep quality reported feeling more subjectively sleepy and having a greater ESS than people who get enough sleep (p=0.02; STOP BANG questionnaire; p0.001). Significant differences existed between the two groups in BMI (p value= 0.0001).

Table 5 shows correlation between demographic data and sleep quality. As regard demographic data, there was significant correlation with BMI (r=0.28, p=0.003), significant negative correlation with So2 (r= -0.18, p=0.04) and there was a significant positive moderate correlation with Epworth scale (r=0.5, p=0.0001).

Table 1: Types of interstitial lung disease in the study

Possible diagnosis	ILD patients (N %)
Chronic HP	59 (53.63%)
NSIP	16 (14.55%)
Acute HP	13 (11.81%)
UIP-IPF	6 (5.45%)
RB-ILD	3 (2.73%)
Non IPF-UIP	3 (2.73%)
LAM	3 (2.73%)
Pleuro-parenchymal fibroelastosis	2 (1.82%)
LIP	2 (1.82%)
Histiocytosis	2 (1.82%)
Sarcoidosis	1 (0.91%)
Total	**110 (100%)**

UIP: Usual Interstitial Pneumonia.
HP: Hypersensitivity pneumonitis.
IPF: Idiopathic pulmonary fibrosis.
NSIP: Nonspecific interstitial pneumonia.
RBILD: Respiratory bronchiolitis interstitial lung disease.
LAM: Lymphangiolyiomatosis.
LIP: Lymphocytic Interstitial Pneumonia.

Table 2: Comparison between Group I and Group II regarding Sex, Age, Spo2, FVC and FEV1

		Group I (Good sleep quality) N= 47	Group II (Bad sleep quality) N= 63	p value
Gender (N%): **Males** **Females**		 8 (17%) 39 (83%)	 12 (19%) 51 (81%)	0.785
Age (y)	**Mean ± SD**	49.38 ± 15.29	53.94 ± 13.77	0.105
SpO2 (%)	**Mean ± SD**	84.53 ± 9.68	80.84 ± 10.38	0.060
FVC	**Mean ± SD**	58.89 ± 15.91	56.33 ± 12.49	0.347
FEV1	**Mean± SD**	62.6 ±19.2	61.6 ±18	0.79

SpO2: oxygen saturation
FVC: Forced Vital Capacity
FEV1: Forced Expiratory Volume in the first second

Table 3: Relation between sleep quality and Smoking and Dyspnea

		Group I (Good sleep quality) N= 47	Group II (poor sleep quality) N= 63	p value
Smoking: **Current smoker** **Non-smoker** **Ex-smoker**	**N %**	5 (10.6%) 40 (85.1%) 2 (4.3%)	7 (11.1%) 53 (84.1%) 3 (4.8%)	0.966
Dyspnea: **Yes** **No**	**N %**	47 (100%) 0	61 (96.8%) 2 (3.2%)	0.22
Dyspnea grading: **G1** **G2** **G3** **G4**	**N %**	 3 (6.4%) 25 (53.2%) 10 (21.3%) 9 (19.1%)	 0 31 (49.2%) 20 (31.7%) 12 (19.0%)	0.294
Pre 6 MWT Spo2	**Median (IQR)**	86.0 (82.0 – 93.0)	85.0 (80.0 – 90.0)	0.166
Post 6 MWT Spo2	**Median (IQR)**	82.0 (75.0 – 90.0)	80.0 (75.0 – 85.0)	0.15
Pre -post desaturation	**Median (IQR)**	4.0 (3.0 – 6.0)	5.0 (3.0 – 6.0)	0.387

- Fischer's exact test for qualitative data between the two groups
. Mann Whitney test for non-parametric quantitative data between two groups
*- *: Significant level at P value < 0.05*

Table 4: Relation between 2 groups of sleep quality and BMI, Epworth scale and STOP BANG questionnaire

		Group I (Good sleep quality) N= 47	Group II (Bad sleep quality) N= 63	P value
BMI	**Mean ± SD**	29.74 ± 4.85	35.24 ± 8.89	**0.0001***
PaO2	**Mean ± SD**	58.01 ± 16.71	53.95 ± 13.55	0.163
Epworth scale	**Mean ± SD**	7.53 ± 2.35	10.63 ± 3.87	**0.0001***
Epworth scale: (N %)				
(11- 15)		46 (97.9 %)	54 (85.7 %)	**0.029***
>15 (excessive sleep)		1 (2.1 %)	9 (14.3 %)	
STOP BANG: (N %)				
Low risk		36 (76.6 %)	27 (42.9 %)	**<0.001***
Intermediate risk		10 (21.3 %)	24 (38.1 %)	
High risk		1 (2.1 %)	12 (19 %)	

- Independent Samples T test for parametric quantitative data between the two groups
-Chi square test for qualitative data between the two groups.
-Fischer's exact test for qualitative data between the two groups.
**: Significant level at P value < 0.05*

BMI: Body Mass Index.
Pao2: arterial Oxygen Pressure.

Table 5: Correlation between sleep quality and demographic and physiological data:

	PSQI score	
	R	**P**
Age	0.179	0.062
BMI	0.28	**0.003***
SO2	-0.189	**0.049***
FVC	0.048	0.618
FEV1	0.14	0.146
FEV1/FVC	-0.002	0.98
Epworth scale	0.516	**0.0001***

- **: Correlation is significant at the <0.05 level (2- tailed).*

Discussion

Overall, 63 individuals (57.2%) were determined to always have poor sleep throughout this study. Consistent with our results, Bosi et al. [12] observed that 47% of people in the study with IPF had poor quality sleep, as indicated by a PSQI rating >five points.

Another study included 101 individuals with ILD; 38 were identified as having IPF, 16 as having ILD due to connective tissue disorders, 10 as having nonspecific inflammatory reactive airway, 14 as having mixed emphysema and pulmonary fibrosis, 4 were diagnosed with sarcoidosis and 4 with asbestosis. There was no more information supplied on the remaining fifteen, save that they had lung fibrosis. A large majority of participants (67 out from 101) exhibited bad caliber of sleep based on a Phq-9 score of even > 5 points, which was not connected to whatever physiological indicators nonetheless, was independently correlated with

greater weariness, as shown by Cho J-G et al. [9]. Particularly, there were no shown causal relationships between age, pulmonary function, and breathlessness.

The global PSQI score and the ESS have both been used to evaluate sleep quality in people with ILD, and those studies have shown that the average values for both measurements are greater in people with ILD [13, 14.[
The high median System is to manage is consistent with other studies, such as a study of 43 individuals with a mean ±SD PSQI of ((6.3±3.7) .

Consistent with our results, Krishnan V et seq. [13] discovered that individuals with IPF slept less and felt sleepier during the day (as measured by ESS) compared to healthy controls; this difference in poor sleep was unrelated to patient demographics such as age, sexual orientation, or lung function.

Mermigkis et al. [14] assessed 15 patients with IPF to 15 controls with similar demographics (age, BMI). The Epworth Sleepiness Questionnaire, the Pittsburgh Sleep Quality Index, and clinical interviews were utilized to determine the relationship between sleep and daily performance (ESS). According to the PSQI, many persons with IPF also had poor sleep quality, and or the ESS scores are indeed higher in these competitor patients than in the healthy controls.

While the findings we've uncovered are substantial, there are several limitations to our study. However, we cannot tell whether or not that sleep quality varies depending on the ILD diagnosis since we have studied a diverse group of ILD patients, including (IPF, elastic epithelium chronic lung diseases, and nonspecific interstitial pneumonitis).

We did not have any patients undergo nocturnal PSG to test for snoring or low oxygen levels throughout the night.

Finally, we cannot draw any conclusions about the cause of poor sleep quality from this study since it was cross-sectional.

Conclusion

Patients with ILD often referred to Minia University Hospital suffer from poor sleep quality, which is independently connected with developing sleepiness symptoms. Our findings highlight the need of conducting in-depth sleep analyses of ILD people to pin down the underlying cause(s) of their poor quality of sleep. More research on the incidence of sleep disturbances in those who have ILD and indeed effects on their day-to-day lives are warranted.
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