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RELATIONSHIP OF RESPIRATORY PATTERN WITH SLEEP QUALITY IN POST-COVID SUBJECTS OF IMPHAL DISTRICTS.

Physiology

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ABSTRACT

Spirometry is an important component in testing lung function both in healthy and lung diseases. The FVC (force vital capacity) and FEV1(forced expiratory volume in 1 second) are mostly used to evaluate respiratory pattern. The post-COVID subjects may have different respiratory pattern despite being recovered from the disease which may affect the sleep quality. Hence, the present study was conducted to evaluate the sleep quality in relation to respiratory pattern in post-COVID subjects of Imphal districts. It was found that 63.4% of the post-COVID subjects were found to be having poor sleep in the study. While 66.67% subjects were found to be having poor sleep among normal respiratory pattern, only 58.8% subjects were having poor sleep among abnormal respiratory pattern. The mean±SD for PSQI score was found to be 5.85±3.921. In both post-COVID groups of having normal and abnormal respiratory pattern, the respondents having poor sleep quality is more but it was not statistically significant ($p>0.05$). Therefore, insomnia has a significant prevalence in post-COVID subjects. Timely identification and treatment are important to avoid the long-term negative impact on subjects experiencing insomnia. The findings of increase in number of post-COVID subjects with normal respiratory pattern having poor sleep in comparison to those with abnormal respiratory pattern reflects the presence of likely attributable factors leading to negative correlations. However, since the research work is in preliminary stage, further study can be done with larger sample size.

KEYWORDS

FEV1, FVC, Respiratory pattern, Sleep, Spirometry

INTRODUCTION:

Coronavirus Disease 2019(COVID-19) is a new respiratory disease which is highly contagious and caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV-2).[1] Many patients who suffered COVID-19 infection have recovered from the initial illness but have had significant morbidity for many months following the infection with ongoing symptoms including fatigue, insomnia, muscle weakness and dyspnea.[2] Spirometry is an important component in testing lung function both in healthy and lung diseases. The FVC (force vital capacity) and FEV1(forced expiratory volume in 1 second) are mostly used to evaluate respiratory pattern. The post-COVID subjects may have different respiratory pattern despite being recovered from the disease which may affect the sleep quality. Hence, the present study was conducted to assess the different types of respiratory pattern in post-COVID subjects and to evaluate the sleep quality in relation to respiratory pattern in post-COVID subjects of Imphal districts.

AIM:

- To perform spirometry tests to determine the FVC and FEV1 values.
- To evaluate the co-relations of sleep quality with respiratory pattern.

MATERIAL AND METHODS:

This study is a cross-sectional study done at the Department of Physiology, RIMS, Imphal on 41 non-smoker post-COVID respondents living in Imphal district between Jan 2021 to May 2022. Spirometry was used to determine the FVC and FEV_1 values and PSQI standard questionnaire was use to assess the sleep quality.

Inclusion Criteria: -

1. COVID-19 survivors of age between 18 years to 60 years of both sexes.
2. COVID -19 survivors who have completed three months after testing negative by RT

Exclusion Criteria: –

1. Suffering from any disease or taking any medicines which are likely to affect the pulmonary function test.
2. History of chronic lung and heart diseases.
3. Participants who cannot walk ≥ 400 metres in 6MWT.

Collection of Data:

The participants for the study were selected according to the inclusion and exclusion criteria. A proforma of all the participants were taken which includes age, sex, address, personal and family history and record their general and systemic examinations. Informed written consent was taken from all the participants. The subjects were divided into asymptomatic and asymptomatic groups. Spirometry was used to determine the FVC and FEV_1 values and PSQI standard questionnaire was use to assess the sleep quality.

RESULTS:

A total of 41 participants (19 males and 22 females) as shown in table 1, in the age group of 18-60 years were included in the study. The average age of males and females were 35.4±13.5 years and females, 42.3±14.5 years respectively as depicted in Table 1.

Table 1: Gender wise distribution of respondents

Sex	N (%)	Age in years (mean±SD)
Male	19 (46)	35.4±13.5
Female	22 (54)	42.3±14.5

The mean±SD of FVC (%pred), FEV1 (%pred) and FEV1/FVC (%pred) were found to be 93.71±19.25, 98.27±20.66, and 105.46±12.53 respectively as shown in table 2.

Table 2: Mean±SD of FVC, FEV1 and FEV1/FVC

FVC (mean±SD)	FEV1(%pred) (mean±SD)	FEV1/FVC(%pred) (mean±SD)
93.71±19.25	98.27±20.66	105.46±12.53

Fig.1: Bar Chart showing Sleep and different respiratory pattern

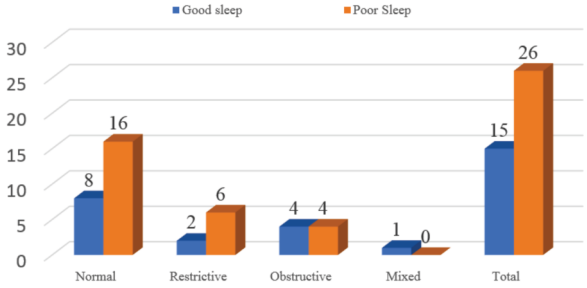

Table 3: Table showing co-relations of sleep quality and respiratory pattern

Respiratory Pattern	Good sleep N (%)	Poor Sleep N (%)	Total N (%)	p-value
Normal	8 (33.3)	16 (66.7)	24 (100)	0.6
Abnormal	7 (41.2)	10 (58.8)	17 (100)	

It is evident from Figure 1 and table 3 that majority of post-COVID respondents have poor quality sleep. In both post-COVID groups of having normal and abnormal respiratory pattern, the respondents having poor sleep quality is more but it was not statistically significant ($p>0.05$).

DISCUSSION:

Insomnia has a significant prevalence in post-COVID subjects even after completion of 3 months of recovery. In our study, 63.4% of the post-COVID subjects were found to be having poor sleep in the study. While 66.67% subjects were found to be having poor sleep among normal respiratory pattern, only 58.8% subjects were having poor sleep among abnormal respiratory pattern. The mean±SD for PSQI score was found to be 5.85±3.921.

Many factors can be attributed to the decrease in the quality of sleep in these respondents. The presence of abnormal respiratory pattern among post-COVID respondents may contribute to the disturbance in sleep. The co-existence of mental health conditions in post-COVID respondents may also plays a role in the development of insomnia.

CONCLUSION:

Insomnia has a significant prevalence in post-COVID subjects.[3] There is a need for timely identification and treatment to avoid the long-term negative impact on subjects experiencing insomnia. The findings of increase in number of post-COVID subjects with normal respiratory pattern having poor sleep in comparison to those with abnormal respiratory pattern reflects the presence of likely attributable factors leading to negative correlations. However, since the research work is in preliminary stage, further study can be done with larger sample size.

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