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OSA raises the odds of severe COVID-19 infection

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Article Info

ABSTRACT:

OSA (Obstructive Sleep Apnea) is a sleep-related breathing disorder considered as a factor which aggravates several diseases. The physician's awareness of the presence of OSA helps to predict the prognosis in COVID-19 infected patients. In this study, our aim was to evaluate whether or not OSA related parameters were associated with severe COVID-19 infection.we assessed a population searched by outpatient's electronic medical record database from COVID-19 patients from Chettinad Health City. A STOP BANG questionnaire was circulated to the study population of 115 sample size selected based on inclusion and exclusion criteria from OSA diagnosed outpatients. The results were analysed and Chi square test was used to show that there is statistical significance between days taken to recover from COVID-19.

1. INTRODUCTION

The coronavirus disease 2019 (COVID-19) is an infectious disease caused by SARS Cov2. It has rapidly developed into a global pandemic with millions of confirmed deaths reported. Many vaccines have been administered globally along with the strategy of sound distancing and face masks use, which is still adopted till now. Another strategical approach is to gain control over risk factors for patients infected by COVID-19. Reports have shown that COVID-19 severity was more common in presence of co-existing illness like HT, CVD, Diabetes.

OSA consists of repetitive short episodes of upper airway collapse with complete (Apnea) or partial (Hypopnea). Obstruction of airway during sleep fragmentation and daytime sleepiness. OSA is potentially fatal with increased risk factors for HT, CVD, stroke diminish quality of life with prevalence rate of 19.5% in men and 7.5% in women. Recently certain specific risk factors associated with severity of OSA also have been reported at risk factors for COVID 19 severity i.e., increased age, higher BMI, male gender, certain papers postulated that not only risk factors for OSA but OSA as a separate entity might be a risk factor for severity. However, it is still unclear to what extent the degree of OSA corelated with COVID-19 severity.

Aims and Objectives
The aim of this study was to evaluate whether or not OSA related parameters were associated with severe COVID-19 infection.

2. MATERIALS AND METHODS

The study was conducted on a study population searched by outpatient's electronic medical record database from COVID-19 patients from Chettinad Health City. After reviewing the medical records, patients were selected based on inclusion and exclusion criteria. Inclusion criteria was included with adults aged 18 years above who have been diagnosed positive rRT - PCR for SARS COV. The exclusion criteria was that subjects should be lesser than 18 years and A questionnaire was circulated to the study population of 115 sample size selected based on inclusion and exclusion criteria from OSA diagnosed outpatients pregnant women children were excluded. enrolled in CDCRI to evaluate the severity of COVID-19 infection based on WHO clinical progression scale with i. Mild disease- ambulatory care, ii. Moderate disease-Hospitalized, iii. Severe disease- ICU admission or death Oxygen therapy, mechanical ventilation. Second parameter of number of days of hospitalization also taken into account. These subjects also circulated with STOP BANG questionnaire, a better clinical predictive tool of OSA and their risk for severe OSA were assessed. Then the subjects with moderate to high risk were assessed for whether affected with moderate to severe type of COVID so the study is a retrospective cross-sectional study.

3. RESULTS

The electronic records of 180 OSA-diagnosed patients who were enrolled in Chettinad Dental College and Research Institute were accessed. Among the 180 patients diagnosed with OSA, 151 patients were COVID positive and we're enrolled in the study. The remaining 29 subjects were excluded from the study since they were COVID negative. Among the 151 patients, OSA patients were categorized as low severity in 18 patients, intermediate severity in 12 patients and high severity in 122 patients. This was based on the STOP BANG questionnaire and the results were depicted in Table 1. COVID severity in these selected 151 sample size patients were assessed to be low risk in 8 patients, moderate risk in 10 patients and high risk in 133 patients. This was assessed based on the WHO clinical progression scale with i. Mild disease - those requires ambulatory care, ii. moderate disease- those who requires hospitalization and care, iii. severe disease- those who are hospitalized and need oxygen therapy, mechanical ventilation and ECMO. In this study patients above 18 years were included and had a mean of 39 ± 2. Gender predilection enrolled were 110 Male (73.3%) and Female (26.7%). Other comorbidities were assessed among the patients and revealed 60 diabetics, 72 hypertensives, 23 combined hypertension and diabetes, 8 with hypothyroidism. Symptoms of COVID-19 were found to be fever (44.8%), Dry cough (23.3%), loss of smell and taste (31.9%), cold (38.8%), tiredness and fatigue (25.9%), breathlessness (85%) and sore throat (23.3%). Breathlessness and fever were found to be high in 128 and 67 patients respectively. Reduced quality of life or limitation in day-to-day activities were found in 128 patients out of 151 patients (84.7%), 133 were hospitalized, 18 were home-quarantined. This depicts the severity of COVID-19 and the need for hospital care. Among the 133 patients who were hospitalized, 42 needed only oxygen therapy with face mask and nasal prongs ,57 required ICU care and 34 were intubated and later went on mechanical ventilation. No subjects were required ECMO. This data explains the severity of COVID-19 infection. Oxygen was continuously administered in the hospitals and patients who recovered within 10 days were found to be 48(32.2%), patients recovered within 11 to 20 days were 83(62.4%), 30 days to recover in 11 patients (6.7%). In this study we

compared the severity of OSA and COVID-19 and found that moderate to high severity OSA were associated with severe type of COVID-19 infection, requiring hospitalization as illustrated in Table 2. Chi square test was used to show that there is statistical significance between days taken to recover from COVID-19 which in turn indicates a severe type of COVID-19 infection and an intermediate to high severity OSA.Therefore, the comparison of parameters such as OSA severity and COVID-19 severity reveals that increased severity of OSA posed an elevated risk for COVID-19 severity.

Table 1.

Variable	Response	N	%
Gender	Female	40	26.7%
	Male	111	73.3%
Are you suffering from any of following medical conditions	High blood pressure	72	47.6%
	Diabetes	60	39.7%
	Both HT and Diabetes	23	15.23%
	Hypothyroidism	3	1.98%
Have you been COVID positive before RT PCR +ve	Yes	151	83.8%
	No	29	16.1%
Did you remain asymptomatic Though diagnosed COVID positive	Yes	8	5.2%
	No	143	94.7%
Did you have symptoms without limitation to daily activities	Yes	18	11.9%
	No	133	88.07%
Have you home quarantined or hospitalized when infected	Hospitalized	133	88.07%
	Homequarantine	18	11.9%
During your hospitalization have you undergone oxygen therapy using oxygen masks or nasal prongs	Yes	42	31.5%
	No	91	68.4%
Have you been admitted in ICU for COVID infection	Yes	57	42.85%
	No	76	57.14%

Have you been assisted with ECMO for COVID	Yes	0	0%
	No	133	100%
Number of days taken for recovery and from using oxygen therapy	10 days	48	32.2%
	11-20 days	83	25.6%
	30 days	11	67%

Do you snore loudly?	Yes	82	54%
	No	69	45.69%
Do you often feel tired fatigued or sleepy during daytime?	Yes	138	91.3%
	No	13	8.6%
Do you have or are beaibg treated for high blood pressure	Yes	72	47.6%
	No	79	13.24%
Has anyone observed you stop breathing or choking	Yes	54	35.76%
	No	97	64.2%
Do you have or are being treated for high blood pressure BMI more than 30 kg/m²	Yes	72	47.68%
	No	79	52.3%
Age older than 50 years Neck size large? Neck circumference 16 inches or 40.6cm	Yes	36	23.8%
	No	115	76.1%
For male ,Is your shirt color 17 inches or larger female is your shirt collar 16 inches or larger	Yes		
	No	43	28.47%
		108	71.5%
Gender =male	Yes	110	72.8%
	No	41	27.14%

Table 2. Days taken to recovery:

		1-10 days	11- 20 days	21-30 days

Low OSA severity	Count	46	2	0
	%within TotalR	95.8%	4.2%	0
Intermediate or moderate OSA severity	Count	6	75	2
	%within TotalR	7.2%	90.36%	2.4%
High severity	Count	0	1	10
	%within TotalR	0	9%	90.9%

4. DISCUSSION

The present study has examined the degree of OSA as a risk factor for COVID 19 severity in a study population consisting solely of OSA patients diagnosed with COVID 19. Strausz et.al found that OSA is associated to COVID 19 severity that was determined based on Nom admission or admission to hospital which supports our study where we considered hospitalization of COVID-19 patients.[1]

A recently published systematic review on COVID 19 and OSA by Miller and Cappuccino concluded that there might be an association between certain risk factors and co morbidities associated with OSA which also supports our study since most of the OSA patients with hospitalization for COVID, were presented with comorbidities of diabetes, hypertension.[2] CORONADA et Al study suggested that treated OSA patients might be associated with increased risk of death from COVID. Our study is in contrast to this study since some treated OSA patients also enrolled in study among 151 but no death cases were reported.[3]

In our study we used clinical parameters namely STOP BANG questionnaire to assess OSA severity which is a valuable clinical predictive tool rather than sleep study parameters in Polysomnography. J.P.T.F.H O and H.C.M Donders et Al used sleep study parameters like LAST, AHI, RDI, ODI and found that increased LSAT (Low Oxyhaemoglobin saturation) were associated with increased COVID severity. Since sleep study PSG -polysomnography is expensive, time consuming patient acceptance is less where patient is monitored while sleeping for a whole night with various electrodes placed in the body, the patient might be anxious and the results are not so predictable with accuracy. Hence in a clinical set up whenever a patient is diagnosed with COVID infection, assessing the OSA severity in them using clinically valuable predictive tool -STOP BANG questionnaire which is reliable less time consuming can identify the OSA risk patients and early treatment in this type of COVID affected patients will prevent the condition to be worsened requiring mechanical ventilation or death.

5. CONCLUSION

As a conclusion, it is important to assess the presence of OSA in patients infected with COVID-19 so as to predict the severity of the disease and implement the recommended management. This study shows that OSA increases the risk for poor prognosis in COVID-19 infected patients. To detect OSA early in a patient increases the chances for better management and for optimal benefit and quality of life of COVID-19 infected patients.

6. REFERENCES

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