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A COMPARATIVE STUDY OF RECOVERY FROM SARS-CoV-2 INFECTION AMONG HEALTHCARE PERSONNELS, SMOKERS AND NON-SMOKERS, WORKING IN A TERTIARY HOSPITAL IN JHARKHAND

General Medicine

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ABSTRACT

SARS-CoV-2 is a respiratory coronavirus which is responsible for COVID-19 pandemic. Healthcare workers are at a much higher risk of contracting SARS-CoV-2 infection when compared to the normal population. SARS-CoV-2 targets epithelial cells. Also, a viral surface spike protein, present on SARS-CoV-2 contains a receptor-binding domain that specifically recognizes ACE-2 and its receptor. Studies suggest that smoking can upregulate angiotensin-converting enzyme-2 (ACE2) receptor. This study puts in an effort to assess the effect of smoking on the recovery from SARS-CoV-2 infection among healthcare workers in a tertiary hospital in Jharkhand.

KEYWORDS

INTRODUCTION

COVID-19 is a coronavirus outbreak that initially appeared in Wuhan, Hubei Province, China, in December 2019, but it has already evolved into a pandemic spreading rapidly worldwide[1, 2]. However, as the pandemic is still unfortunately under progression, there are limited data with regard to the clinical characteristics of the patients as well as to their prognostic factors[3]. Smoking, to date, has been assumed to be possibly associated with adverse disease prognosis, as extensive evidence has highlighted the negative impact of tobacco use on lung health and its causal association with a plethora of respiratory diseases[4]. Smoking is also detrimental to the immune system and its responsiveness to infections, making smokers more vulnerable to infectious disease[5]. Little attention has been given to the role of smoking in either the transmission of SARS-CoV-2 or mortality rate of COVID-19. Smokers contract more respiratory ailments, including colds (commonly rhinoviruses, but also coronaviruses) than non-smokers. Smokers also show double the influenza rate and increased rates of bacterial pneumonia and tuberculosis[6–10]. The damage caused to the lungs by smoking makes patients more susceptible to pulmonary infections, both bacterial and viral[6]. Smokers are 34% more likely than non-smokers to contract the flu[11]. Most patients are asymptomatic and symptoms include fever, dry cough and tiredness. Less frequent presentations include generalized body ache, sore throat headache, conjunctivitis, diarrhea, loss of taste and smell.

AIMS AND OBJECTIVES

A comparative study of COVID-19 infected healthcare workers, smokers and non-smokers, based on-

1. Duration of symptoms
2. Duration of hospital stay

MATERIALS AND METHODS

A cross-sectional study involving 76 healthcare workers (junior residents and nursing staffs) of Rajendra Institute of Medical Sciences, Ranchi who contracted SARS-CoV-2 infection during June, 2020 and July, 2020.

Inclusion Criteria

1. RT-PCR SARS-CoV-2 positive symptomatic healthcare workers (junior residents and nursing staffs) admitted in Rajendra Institute of Medical Sciences, Ranchi.
2. A healthcare worker was grouped among smokers if-

a) Duration of smoking was at least 2 years
b) He/she smoked at least 1 pack-year

Exclusion Criteria

RT-PCR COVID-19 positive healthcare workers (junior residents and nursing staffs) with

1. Co-morbidities (like DM2,HTN, B. Asthma, any chronic renal or liver disease, etc)
2. Age above 40 years, were excluded from the study.

RESULTS

Among 76 healthcare personnels working at Rajendra Institute of Medical Sciences, Ranchi who contracted SARS-CoV-2 infection, 41 were smokers and 35 were non-smokers.

Duration for which the symptoms lasted in the two groups is tabulated below in Table 1.

Table 1: Duration Of Symptoms

	<1 week	>1 week
Smokers(35 patients)	12(34.3%)	23(65.7%)
Non-smokers(41 patients)	28(68.3%)	13(31.7%)

- Among non-smokers(41 patients), 22(53.6%), 15(36.6%) and 4(9.7%) patients became COVID-19 RT-PCR negative for the first time post-infection on day 8, day 15 and after 15 days, respectively.
- Among smokers(35 patients), 9(25.7%), 14(40%) and 12(34.3%) patients became COVID-19 RT-PCR negative for the first time post-infection on day 8, day 15 and after 15 days, respectively.

Duration of hospital stay for both the groups is tabulated below in Table 2.

Table 2: Duration Of Hospital Stay

	<10 days	>10 days
Smokers(35 patients)	9(25.7%)	26(74.3%)
Non-smokers(41 patients)	22(53.6%)	19(46.3%)

DISCUSSION

Smokers are vulnerable to respiratory viruses. Smoking can upregulate angiotensin-converting enzyme-2 (ACE2) receptor, the known receptor for both the severe acute respiratory syndrome (SARS)-coronavirus (SARS-CoV) and the human respiratory coronavirus NL638.[12]

Also, smoking damages the respiratory epithelium and predisposes the subject to various respiratory infections. SARS-CoV-2 targets epithelial cells.

In our study, majority of healthcare workers who were smokers took more than one week to recover from symptoms while most of the non-

smokers became asymptomatic within a week.

Most of the non smokers (53%) stayed in hospital for a lesser duration while approximately three-fourth smokers (74.3%) had to stay for longer duration before being discharged.

CONCLUSION

Healthcare personnels with a habit of cigarette smoking usually take longer to become asymptomatic after contracting SARS-CoV-2 infection. Among the healthcare workers who are COVID-19 positive, smokers usually have a prolonged hospital stay when compared to the non-smokers.

Healthcare workers are at a much higher risk of contracting SARS-CoV-2 infection when compared to the normal population. So, the need of the hour is to aware health personnels regarding the hazardous effect of smoking and its association with SARS-CoV-2 infection. This awareness may help in managing the shortage of manpower and using hospital resources judiciously during this COVID-19 crisis.

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