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A Cross-sectional study on effect of Covid 19 infection among smokers in Chamarajanagar district.

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ABSTRACT

Background: Tobacco is one of the deadliest public health threats to humankind, killing more than eight million people a year globally. Combined with COVID-19, smoking is even more lethal, in which smoked tobacco damage the lungs tissue and reduces its function drastically. So, comparing to a non-smoker the smoker has more chance of developing severe COVID-19 infection and related complications.

Methods: This cross-sectional study was conducted in a tertiary care center of Chamarajanagar District. All Adult patients who attended the study settings with previous history of Covid 19 infection and history of smoking was administered a pre-tested semi structured questionnaire after meeting inclusion criteria. The questionnaire was structured into 4 parts to meet the expected objectives. The data obtained was entered into MS Excel and analysed.

Results: The study included 103 participants; out of which 65% belongs to the age group of more than 40 years. Majority of the study subjects were literate and semi-skilled workers which comprise 58% & 64% respectively. 81% of the study subjects were not vaccinated at the time of infection, but in contrast 97% were vaccinated at the time of interview. Majority of the subjects are current smokers (73%), and many of them prefers Beedis to smoke. A proportion of 44% are smokers for more than 15 years and half of total smokers are thinking it has ill effects on health. The major symptoms identified in our study were fever, cough & body ache.

Conclusion: Cause effect analysis shows direct relationship between number of cigarettes smoked per day and number of days require for institutional care during infection. This leads to the necessity to quit smoked tobacco products as soon as possible in high-risk individuals for better health outcome.

Key words: Covid 19 infection, smoker, effect, complication, severity.

INTRODUCTION

Smoking affects a person's overall health and damages nearly every organ of the body. Since smoking tobacco affects and damages the lungs, it increases the risk of respiratory infections and makes it easier for the corona virus disease (COVID-19) to invade the lung tissue, causing more severe symptoms and increasing the risk of mortality[1].

Any kind of tobacco smoking is harmful to bodily systems, including the cardiovascular and respiratory systems [2,3]. COVID-19 can also harm these systems. Evidence from China, where COVID-19 originated, shows that people who have cardiovascular and respiratory conditions caused by tobacco use, or otherwise, are at higher risk of developing severe COVID-19 symptoms [4]. Research on 55,924 laboratory confirmed cases show that the crude fatality rate for COVID-19 patients is much higher among those with cardiovascular disease, diabetes, hypertension, chronic respiratory disease or cancer than those with no pre-existing chronic medical conditions [5]. This demonstrates that these pre-existing conditions may increase the vulnerability of such individuals to COVID-19.

Tobacco is one of the deadliest public health threats to humankind, killing more than eight million people a year globally. Combined with COVID-19, smoking is even more lethal in COVID-19, in which tobacco smoke attacks the lungs and reduces its function. Tobacco smoke also compromises the immune system of a smoker, making it harder to fight off the deadly virus, placing smokers at higher risk of severe complications. When tobacco toxins enter the body through the mouth and nose, they cause tissue and cells damage up to the lungs, including upper lung airways and alveoli, resulting in lung inflammation and reduced lung and immune function. Consequently, cigarette smoking causes lung diseases such as bronchiolitis, chronic bronchitis, pulmonary emphysema, tuberculosis, and lung cancers, in addition to an increased risk of respiratory infections[6].

Smoking also requires high respiratory volumes, deep inhalation, progressive cooling and drying of the mucous respiratory tract, and changes in nose-to-mouth breathing. It reduces the mobility of ciliated cells and raises the viscosity of the mucous membrane, which impairs the filtration of microorganisms from the upper respiratory tract system. Thus, smoking reduces the ability of the lung to absorb oxygen and release carbon dioxide, storing up mucus, which leads to excessive coughing and difficulties in breathing [6].

The complications observed in patients with COVID-19 were cardiovascular system involvement leading to arrhythmias, cardiomyopathy, prothrombotic complications such as DVT, MI, Ischemic stroke .GI complications such as bowel ischemia, GI bleeding, Pancreatitis.Other complications such as Acute renal failure, fungal complications such as COVID-19 associated pulmonary aspergillosis and rhino-cerebro-orbital mucormycosis[7].

Tobacco Use among Adults age 15 years and above who use any kind of tobacco in Chamarajanagar district is 22.4% (NFHS-5{2019-2020} district fact sheet)[8.] This increased prevalence possessed threat to develop severe complication among COVID infected individuals. Based on these mechanisms, smoking is hypothesized to increase risks associated with COVID-19. Based on numerous studies it was found that there is increased incidence of hospitalization for COVID-19 among smokers. Hence there is a direct relation between severity of COVID-19 infection and hospitalization rates among smokers.

Need for study

Tobacco smoking is implicated as a causative agent in many diseases, the focus of this study is on the role of tobacco and Covid-19 disease severity and the rate of hospital admission required among infected individual.

Several study available in other countries related to smoking and COVID-19 infection, meanwhile there is lack of evidence suggested to the same in Indian contest. So, our study focused on the stipulated objectives in a rural district of Karnataka state.

OBJECTIVES:

1. To assess relationship between smoking and severity of covid-19 infection.
2. To assess the rate of hospital admission during covid 19 infection among smokers.

METHODOLOGY

This is a cross-sectional study on effect of COVID 19 infection among smokers in a tertiary care center of Chamarajanagar.

Study design:

Hospital based Cross sectional study

Study Setting:

OPDs of departments of general medicine and pulmonary medicine of CIMS Hospital, Chamarajanagar

Study population:

All Adult patients who attended the study setting with previous history of Covid 19 infection and history of smoking.

Study period:

The study was carried out for the period of 3 months, March to May 2022.

Inclusion criteria.

-Adult smokers with previous history of Covid 19 infection

-Willing to give informed consent.

Exclusion criteria

Severely ill patients at the time of interview.

Sampling technique:

All Adult patients who attended study setting during the study period (periodic sampling).

Sample size:

$$n = 4pq / d^2$$

A study conducted in Tongji Hospital, China by Chen et.al observed a 7% of prevalence for current or former cigarette smoking history among total participants.[9] Absolute error taken as 5% which gives us final sample size of 103.

Materials used:

The study was approved by IEC and a pre-tested semi structured questionnaire, which was internally validated, was administered to the study population. The questionnaire had 4 parts.

Part A – Demographic details and COVID vaccination status.

Part B – Smoking habits of the participants.

Part C – Severity of COVID-19 infection and Hospitalization details.

Part D – Post COVID complications.

Case definition for COVID 19 confirmed case:[5]

A- A person with a positive NAAT (RT-PCR) test.
B- A person with a positive SARS COV-2 Antigen RDT

Statistical analysis: Data was entered in MS Excel and analysed. Frequency and percentages were calculated for socio-demographic characteristics.

RESULTS

In the present study a total of 103 subjects met the inclusion criteria, they were all male with a majority of them being in the age group of 41-60 years as given below

Table 1: Demographic characteristics of study population

Demographic Characteristics		**Frequency**	**Percentage**
Age	18-25 Years	5	4.85%
	26-40 Years	31	30.10%
	41-60 Years	49	47.57%
	>60 Years	18	17.48%
Education	Illiterate	43	41.75%
	High school education	35	33.985
	PU/ Diploma	11	10.68%
	Graduate	13	12.62%
	Post graduate	1	0.97%
Occupation	Unemployed	11	10.68%
	Semi-skilled worker	66	64.08%
	Skilled worker	15	14.56%
	Professionals	11	10.68%
Socio-economic status	Class II	5	4.85%

(Mod. BG Prasad)	Class III		32	31.07%
	Class IV		35	33.98%
	Class V		31	30.10%
Vaccination status	Vaccinated	Covaxin	26	26%
		Covishield	74	74%
	Not vaccinated		3	2.91%
Vaccination status at time of infection	Vaccinated		20	19.42%
	Not Vaccinated		83	80.58%

Figure 1: Frequency of study population according to vaccination status at time of infection

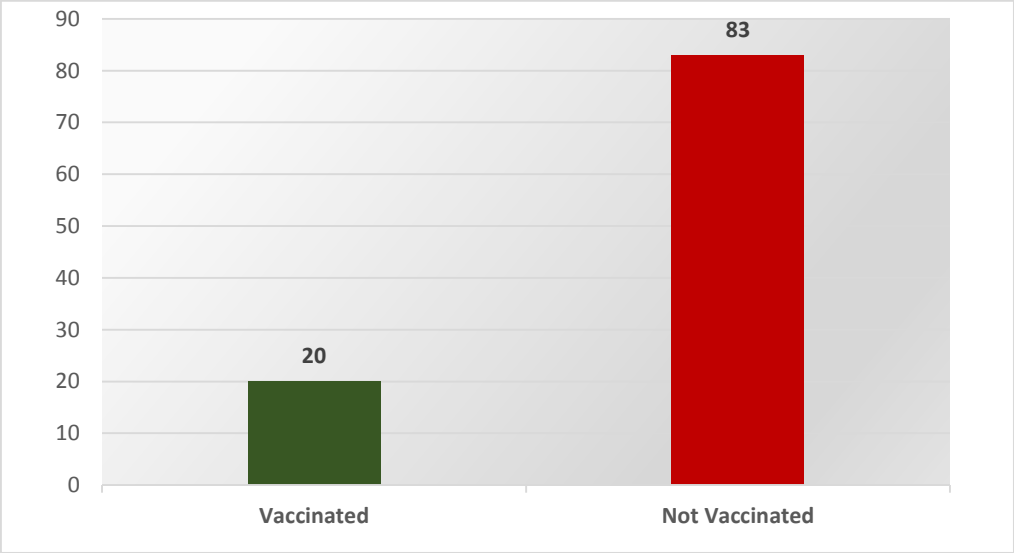


Table 2: Characteristics of study population according to smoking habit

	Details of smoking	**Frequency**	**Percentage**
Smoking at the time of covid 19 infection	Yes	27	26.21%
	No	76	73.79%
Current smoking status	Smoking	75	72.82%
	Quit smoking	28	27.18%
Type of tobacco used	Beedis	66	64.08%
	Cigarettes	29	28.16%
	Both	8	7.77%
Duration of smoking	< 5 years	11	10.68%

	5-10 years	34	33.01%
	10-15 years	13	12.62%
	>15 years	45	43.69%
Number of cigarettes smoked	<5/day	28	27.18%
	5-10/day	33	32.04%
	11-20/day	22	21.36%
	>20/day	20	19.42%
History of tobacco use at home or workplace by others	Yes	26	25.24%
	No	77	74.76%
Outlook on smoking	Does not affect health	3	2.91%
	Has ill effects on health	53	51.46%
	I don't know	44	42.72%
	Others	3	2.91%

The table 2 shows a proportion of 26% were smoking at the time COVID infection and almost an equal share of study participants quit smoking thereafter. Most of the participants (64%) were used beedis as tobacco product to smoked and nearly half of the total patients are smokers for more than 15 years. A total of 60% used to smoke < 10 cigarettes/ day in our study and a three-fourth of total participants had history of tobacco usage at home & workplace

Figure 2: Frequency of study population according to type of tobacco product used

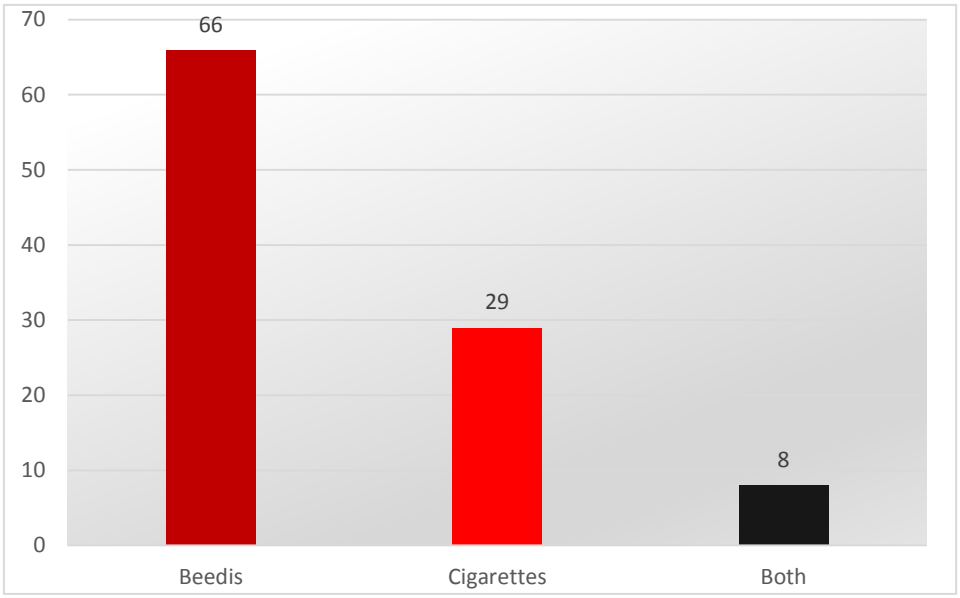


Table 3: Characteristics of study population according to COVID-19 infection

	Symptoms	**Frequency**
Symptomatology during the infection*	Fever	72
	Cough	77
	Body ache	47
	Fatigue	38
	Breathlessness	8
	Chest pain	2
	Sore throat	39
	Loss of taste/smell	20
	Others	1
	Asymptomatic	13

* Multiple responses

		Frequency	Percentage
Type of care received	Home isolation	32	31.07%
	Covid care centre	57	55.34%
	Hospital admission	14	13.59%
Days admitted in hospital/CCC	<7 days	15	14.56%
	7-14 days	45	43.69%
	14-21 days	7	6.80%
	>21 days	4	3.88%
	NA	32	31.07%
Complication after getting admitted at hospital	Yes	6	5.83%
	No	97	94.17%

Figure 3: Pie-chart showing proportion of study population according to symptoms of COVID-19

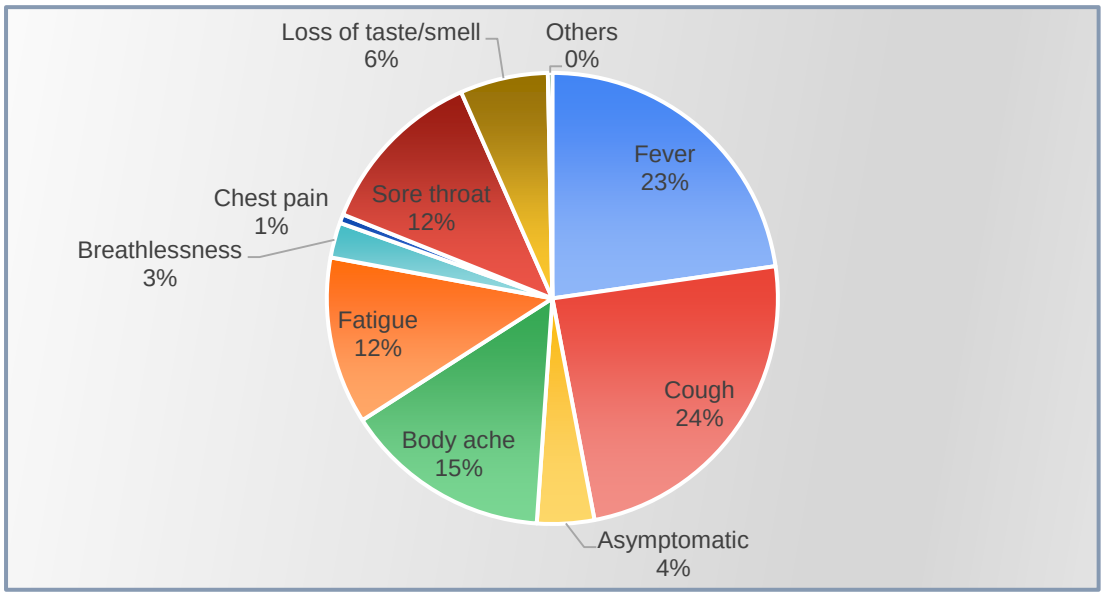
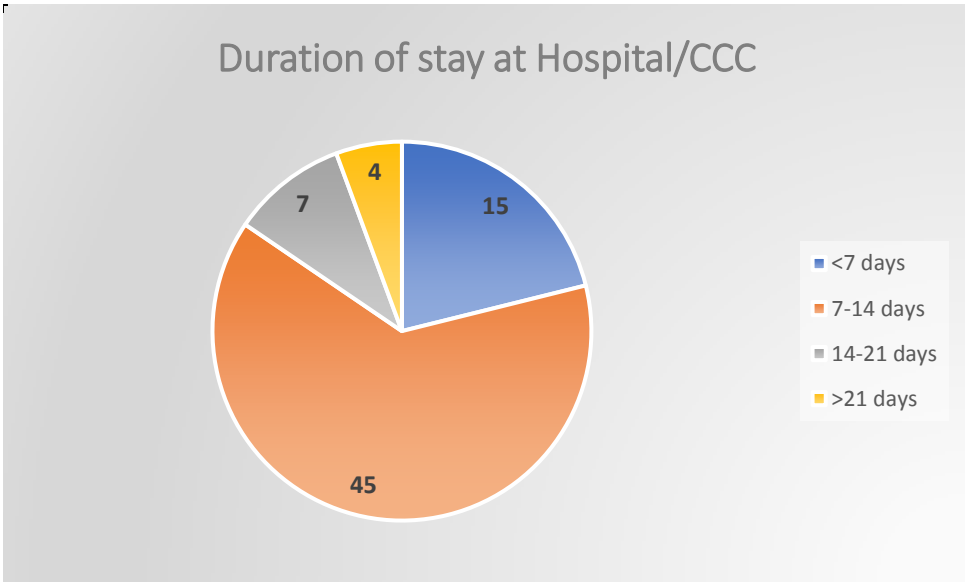


Figure 4: Pie-chart showing frequency of study population with respect to duration of stay at health care centre (n=71)



he major symptoms associated with COVID infection was fever & cough followed by body ache, fatigue & sore throat. The minority of the participant advised for home isolation (30%) and remaining required to be got admitted in CCC & Hospitals, in which most of them required specialized care for 7-14 days. The co-morbidities were present among 19% of the patients were many of them are either hypertensive or diabetic. Only 6% of the patients suffered any complication during the hospital admission.

The results found was analyzed with inferential statistics, test of significance for cause effect association which found to be significant only for number of days hospitalized during COVID-19 infection and total number of cigarettes smoked per day with direct relation as the number of days of hospital admission increases with number of cigarettes smoked/day with a significant 'P' value.

Discussion:

The present study assesses the health outcome of COVID-19 infected smokers in a tertiary care Centre of a rural district of Karnataka. Tobacco use has a huge impact on respiratory health and is the most common cause of multiple lung disorders. Its effect on COVID-19 infected individuals may result into severe fatality. However, as COVID-19 is a newly identified disease, the link between tobacco uses and the disease needs further documentation and research.

The virus that causes COVID-19 (SARS-CoV-2) is from the same family as MERS-CoV and SARS-CoV, both of which have been associated with cardiovascular damage (either acute or chronic) [10,11]. There is also evidence that COVID-19 patients that have more severe symptoms often have heart-related complications [12]. This relationship between COVID-19 and cardiovascular health is important because tobacco use and exposure to second-hand smoke are major causes of CVDs globally [13].

In accordance with the recent reports on characteristics of patients with covid-19 who needed management in intensive care units, advanced age (>60), male sex, and comorbidities (particularly hypertension) are believed to be risk factors for severe disease and death from SARS-Cov-2 infection.[14]

From our study among 103 individuals all the participants were males, in accordance with the study by Chen et.al[9] 62% were the proportion of male participant and 81% of study participants belong to >40 years age group which shows male predominance among smokers and about 65% belongs to age group > 40 years and in our study.

In our study it was found that, 97% were vaccinated against the COVID-19 during the interview out of which 20% were vaccinated before they got infected, which shows positive attitude of participants towards the vaccination. Out of total vaccinee 76% got vaccine 'COVISHIELD' and remaining received 'COVAXINE'.

The co-morbidities identified in our study was on 19% of patient, in contrast the other study have identified co-morbidities among 49% in which many of them have Hypertension & diabetes which is similar to our study. Regarding cigarette smoking 26% where smokers at the time infection were in the other study the current smokers were only 4%. A total of 27% in our study quit smoking thereafter where in the study by Chen et.al 3% were mentioned as former smokers[9].

The type of smoked stuffs identified as cigarette, beedi or both in which 64% of participants gave preference to beedi, many of the patients (44%) replied they continued smoking for more than 15 years. A total of 41% of patients gave history of smoking more than 10 cigarette product/day which is even more a matter of concern. 51% of total interviewed subjects replied smoking had adverse effect on health.

Comparing the sign & symptom at disease onset, from our study which could observe that most predominant symptoms were cough, fever, body ache, sore throat, fatigue respectively from higher order of onset where in the comparative study it was also observed same except for dyspnea and chest tightness.[9]

In our study a total of 69% required hospital of covid care Centre care and remaining were advised for home isolation till the symptoms relieved or tested negative, among them who admitted 63% were

required care for 7-14 days and 15% required more than 14 days. A total of 6% developed complication during hospital stay in our study.

The study put forward that smoke tobacco product has direct adverse effect on respiratory and other metabolic function especially during COVID-19 infection. Strengthened tobacco control measures, including tobacco-free public places and the protection of people from second-hand smoke as per Article 8 of the WHO FCTC and its Guidelines could reduce the risk of suffering from severe symptoms[2]. Lower rates of tobacco use will reduce rates of many respiratory and cardiovascular conditions that are associated with more serious COVID-19 symptoms and mortality.

Good respiratory and cardiovascular health is important for a COVID-19 patient to positively respond and successfully recover from the disease. In addition, improved tobacco control could substantially reduce the background demand placed on health systems at this time, allowing more resources to be focused on treating COVID-19 patients. Research shows that the introduction of comprehensive, enforced smoke-free laws around the world was followed by significant reductions in hospital admissions for a wide variety of acute cardiac and respiratory diseases[15].

Limitation of the study:

The follow up of the participants were not done during the study due to time constraints and ethical concern. The cause effect analysis couldn't show expected results in many of the variable.

Conclusion:

The study population consist of only male smokers, which shows the least prevalence of smoking among females in our study population even though the study area has a prevalence of 2.8% of female tobacco users according to NFHS 5.

The present study could identify that smoking as one of the major effect modifiers for Covid 19 related complications and severity. The institutional care required for the study population was nearly 70%, which poses the threat of cigarette smoking on infected patients. The major symptoms identified in our study were not much different from other similar studies, which were cough, fever, sore throat and body ache. The direct relationship was found between the number of tobacco products smoked and number of days of institutional care required, which lead to the concern of severe lung damage due to extensive smoking. The most common tobacco products smoked were beedies (64%), which is more lethal compared to cigarettes. This leads to the necessity to quit smoked tobacco products as soon as possible in high-risk individuals for better health outcome.

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Declarations:

Funding: None

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

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