ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

A cross-sectional study on tobacco usage among COVID-19 positive patients admitted in a tertiary care center in Mizoram, India

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Submission: 25-11-2022 Revision: 13-12-2022 Publication: 01-01-2023

ABSTRACT

Background: Mizoram is one of the states in India with the high prevalence of tobacco usage both in terms of smoke form and smokeless form. In spite of high prevalence of smoking, the state has reported less COVID-19 related mortality. The prevalence of tobacco usage among the COVID-19 positive patients and its relation to clinical symptoms and mortality has not been studied in North East part of India. **Aims and Objectives:** The aim of the study was to study the association of tobacco usage and its relation to clinical symptoms and mortality in COVID-19 patients. **Materials and Methods:** A total of 100 COVID 19 positive patients admitted in wards of Zoram Medical College, Mizoram between June and August 2020 were selected using convenient sampling. The patients were interviewed over mobile phone after getting informed oral consent. The details regarding socio-demographic variables, tobacco usage, co morbidities, and clinical symptoms were collected from the patients. Comorbidities and smoking were considered as primary outcome variables. The mean values were compared between study groups using independent sample t-test (two groups). Categorical outcomes were compared between study groups using Chi-square test/Fisher's Exact test (If the overall sample size was <20 or if the expected number in any one of the cells is <5), Fisher's exact test was used. **Results:** Out of 100 patients, 54% were males, the mean age was 27.71 years. Recent history of travel was noted in 82% and 12% had history of contact with positive case. Smokers were 42% and 36% were past smokers. The various other forms of tobacco products used were Gutkha (10%), Tuibur (3%), Sahdah (13%), and Kuhva (52%). About 37% were symptomatic. The common symptoms observed were fever (19%), cough (14%), body pain (9%), and sore throat (9%). Only 4% had difficulty in breathing. 19 (45.24%) of the smokers were symptomatic while 18 (31.03%) were symptomatic among nonsmokers ($P=0.092$). Mortality was 0% among our study population. **Conclusion:** The present study showed that symptomatic patients were more among smokers when compared with nonsmokers, but the findings were not statistically significant. Hence, further studies needed to be done in this area with a larger sample size.

Key words: Kuhva; SARS-CoV-2; North East; Prevalence; Smoking

Access this article online

Website: http://nepjol.info/index.php/AJMS

DOI: 10.3126/ajms.v14i1.49843

E-ISSN: 2091-0576

P-ISSN: 2467-9100

INTRODUCTION

According to the World Health Organization, nearly 22.3% of global population were using tobacco in 2020.[1] According to the Global adult tobacco survey Round 2, 2016–2017, India Report, nearly 28.6% (266.8 million) of adults in India, aged 15 and above currently use tobacco in some form.[2] The National Family Health Survey conducted

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in 2019–2020 in 22 states and union territories showed that the prevalence of tobacco use among men has declined in most states, except Sikkim, Goa, Bihar, Gujarat, Himachal Pradesh, and Mizoram, where an upward trend has been seen.[3] In the case of women, the prevalence has declined in almost all states except Mizoram and Sikkim. Tobacco use in north eastern states remains a major problem and challenge.[4,5]

A meta-analysis done by Lippi and Henry which consisted of five studies showed that there is no association between smoking and severity of COVID 19 infection.[6] In contrast, a systematic review done by Vardavas and Nikitara[7] concluded that smoking is most likely associated with the negative progression and adverse outcomes of COVID-19. The prevalence of tobacco usage among the COVID 19 positive patients and its relation to severity of clinical symptoms and outcome has not been studied in North East part of India.

Aims and objectives

Hence, we wanted to study the prevalence of tobacco usage among COVID-19 positive patients admitted in wards in a tertiary care hospital in Mizoram. The aim of the study was to study the relationship of COVID 19 symptoms among all forms of tobacco users.

MATERIALS AND METHODS

The study was conducted in Zoram Medical College, Mizoram. The data of COVID 19 patients admitted in the wards between June and August 2020 were taken and then by using convenient sampling technique 100 COVID-19 patients admitted and discharged from ward were contacted over phone and interviewed after getting informed oral consent. A questionnaire consisting of socio demographic details, clinical symptoms, details regarding smoking tobacco, usage of smokeless forms of tobacco, usage of other tobacco related products, and outcome of the patients were collected. The study was conducted after getting Institutional Ethical Clearance from Zoram Medical College.

Working definition

Current smoker

An adult has smoked 100 cigarettes in his or her lifetime and who currently smokes cigarettes.

Past or former smoker

An adult has smoked at least 100 cigarettes in his or her lifetime but who had quit smoking at the time of interview.

Never smoker

An adult has never smoked, or who has smoked <100 cigarettes in his or her lifetime.[8]

Statistical methods

Comorbidities and smoking were considered as primary outcome variables. Symptoms (Present vs. Absent) were considered as primary explanatory variable. Descriptive analysis was carried out by frequency and proportion for categorical variables and mean and standard deviation for quantitative variables. For normally distributed quantitative parameters, the mean values were compared between study groups using Independent sample t-test (2 groups). Categorical outcomes were compared between study groups using Chi-square test/Fisher's Exact test (If the overall sample size was <20 or if the expected number in any one of the cells is <5), Fisher's exact test was used. $P<0.05$ was considered statistically significant. IBM SPSS version 22 was used for statistical analysis.[9]

RESULTS

A total of 100 participants were included in the final study. The mean age of the study population was 27.71 years, majority 82% had a recent history of travel (Table 1).

About 37% of the study population were symptomatic. The most common symptoms were fever (19%), cough (14%), and sore throat (9%). About 14% had comorbidities, and the common comorbidities were hypertension (4%) and diabetes (3%) (Table 2).

In the present study, 42% were smokers and 63% were past smokers. Usage of other tobacco related products were observed in 63%. Only 4% had breathing problems. All the patients recovered and were alive. Khuva(52%) was the most common smokeless form of tobacco used (Table 3).

In the present study we compared the relationship of symptoms with comorbidities. We did not find any statistical difference between comorbidity and symptoms (Table 4).

Table 1: Descriptive analysis of baseline parameters in the study population (n=100)

Parameter	Mean±SD (%)
Age (in years)	27.71±8.89 (8.0, 59.0)
Number of family members	5.55±2.24 (0.0, 13.0)
Travel history	
Yes	82 (82)
No	4 (4)
Contact	12 (12)
Unknown/contact	2 (2)
Mode of travel	
Bus	1 (1)
By road	7 (7)
Fight	18 (18)
Flight, Taxi	2 (2)
Train	54 (54)
Nil	18 (18)

Table 2: Descriptive analysis of COVID 19 symptoms in the study population

Parameters	Summary (%)
COVID-19 symptomatic patients	37 (37)
Sore throat	9 (9)
Loss of appetite	3 (3)
Loss of sense of smell	6 (6)
Fever	19 (19)
Cough	14 (14)
Diarrhea	4 (4)
Vomiting	1 (1)
Body pain	9 (9)
Cold	9 (9)
Fast heartbeat	1 (1)
Lack of sleep	1 (1)
Comorbidity	14 (14)
Hypertension	4 (4)
Low BP	1 (1)
Cardiac illness	1 (1)
Anxiety	1 (1)
Sinusitis	1 (1)
Urinary tract infection	1 (1)
Gastritis	1 (1)
Diabetes	3 (3)

Table 3 : Descriptive analysis of smoking related parameters and outcome in the study population (n=100)

Parameters	Summary (n [%])
Smoker	42 (42)
Smoking (in years) (Mean±SD)	3.57±6.42 (0.00, 30.00)
Past smoker	36 (36)
Usage of other tobacco products (apart smoking)	63 (63)
Gutka	10 (10)
Tuibr	3 (3)
Sahdah	13 (13)
Khuva	52 (52)
Both smoking and other tobacco products	65 (65)
Breathing problem	4 (4)
Tobacco years (Mean±SD)	3.73±5.22 (0.00, 20.00)
Outcome	
Alive	100 (100)
Dead	0 (0)

Table 4: Comparison of symptoms between comorbidities (n=100)

Symptoms	Comorbidities		Chi-square	P-value
	Yes (n=14) (%)	No (n=86) (%)		
Present	8 (57.14)	29 (33.72)	2.834	0.092
Absent	6 (42.86)	57 (66.28)		

The presence of COVID 19 symptoms and having co-morbidity was compared with smoking habit. Presence of COVID-19 symptoms and having co-morbidity was not associated with smoking (Table 5).

In the present study we compared the usage of other tobacco products and its relation to COVID-19 Symptoms. We did not find any significant association when comparing usage of other tobacco related products with COVID-19 symptoms (Table 6).

Table 5: Comparison of symptoms/comorbidities between smoking (n=100)

Parameters	Smoker		Chi-square	P-value
	Yes (n=42) (%)	No (n=58) (%)		
Symptoms				
Present	19 (45.24)	18 (31.03)	2.108	0.147
Absent	23 (54.76)	40 (68.97)		
Comorbidities				
Yes	7 (16.67)	7 (12.07)	0.428	0.513
No	35 (83.33)	51 (87.93)		

Table 6: Comparison of usage of other tobacco products between symptoms (n=100)

Parameters	Symptoms		Chi-square	P-value
	Yes (n=37) (%)	No (n=63) (%)		
Usage of other tobacco products				
Yes	24 (64.86)	39 (61.9)	0.088	0.767
No	13 (35.14)	24 (38.1)		
Gutka				
Yes	4 (10.81)	6 (9.52)	0.043	1.000
No	33 (89.19)	57 (90.48)		
Tuibr				
Yes	1 (2.7)	2 (3.17)	0.018	1.000
No	36 (97.3)	61 (96.83)		
Sahdah				
Yes	5 (13.51)	8 (12.7)	0.014	1.000
No	32 (86.49)	55 (87.3)		
Khuva				
Yes	22 (59.46)	30 (47.62)	1.309	0.253
No	15 (40.54)	33 (52.38)		

DISCUSSION

In the present study, the mean age of the study participants was 27 years. A study done in Tehran, Iran by Alizadehsani et al.,[10] showed a mean age of 45. This shows that the present study population was a comparatively younger population that got admitted in wards. This might also be the reason for the zero mortality outcome in the present study. In the present study fever (19%), cough (19%), and sore throat (19%) was the most common symptom, this was comparable with other studies done by Alizadehsani et al.,[10] Zhang et al.,[11] and Zheng et al.[12]

The present study did not find out any statistically significant association between smoking and severity of disease progression and also did not find out any association between smoking and COVID-19 related mortality. In the present study, 19 (45.24%) of the smokers were symptomatic while 18 (31.03%) were symptomatic among nonsmokers (P=0.092). The finding was not statistically significant. This finding was similar to the

Table 7: Comparison of the present study with other studies[10-13]

Study done by	Location	Sample size	Most common symptoms	Tobacco use and COVID-19
Alizadehsani et al.	Tehran, Iran	319	Fever	Did not find any association
Zhang et al.	Wuhan, China	221	Fever, fatigue and cough	Did not find any association
Zheng et al.	Chengdu China	99	Fever, dry cough and fatigue	Did not find any association
Mahamat-Saleh et al.	Metaanalysis of studies from different parts of the world	47096 Participants of ever smoking versus never smoking. 28 Studies included for assessing smoking and COVID-19 mortality	Did not look into these factors	COVID-19 mortality was associated with smoking and it increased by 7%. 1.28 fold greater risk of mortality among smokers
Present study	Mizoram India	100	Fever, cough and sore throat	Did not find any significant association

study done by Tsigaris and Teixeira da Silva in Europe.[14] The study done by Tsigari and Teixeira da Silva showed that there was no evidence of a direct association between smoking prevalence and COVID-19 mortality.[14] In contrast, the meta-analysis done by Patanavanich and Glantz showed that smokers had higher risk of progression when compared with non-smokers in COVID-19 patients.[15]

Another meta-analysis done by Lippi and Henry which consisted of five studies showed that there is no association between smoking and severity of COVID 19 infection.[6] A study done by Liu et al.,[16] found in multivariate logistic regression analysis, the history of smoking was a risk factor of disease progression (OR=14.28; 95% CI: 1.58–25.00; P=0.018).

The present study showed that the prevalence of smoking tobacco was 42% and the usage of smokeless form of tobacco was 63%. The smokeless form of tobacco usage was higher than smoke form of tobacco usage. This was comparable with the survey done jointly by Indian Council of medical research and National Centre for disease informatics and research. In that survey they found that the prevalence of tobacco use (smoked and smokeless) in Mizoram is as high as 77.1%, with the use of smokeless tobacco higher at 54.1% as compared to smoked tobacco at 43.6%.[17]

The present study reported zero mortality, this can be attributed to comparatively younger population of the COVID-19 patients that got admitted in the present study. The mean age of the present study population was only 27 years which was very low when compared with other studies.[10-13] From the discussion, we can see that some studies have reported smoking who had an association with COVID-19 mortality, while other studies did not show any significant association between smoking and COVID-19 mortality, this can be attributed to various reasons such as the difference in study settings, age groups getting admitted, ethnicity, sample size, comorbidities, obesity, health-care facilities, case load of the patients, and also the SpO_2 at the time of admission in the hospital. Hence, in future similar study with large sample size and including other confounding factors associated with COVID-19 mortality needs to be studied (Table 7).

Limitations of the study

The sample size of the present study was small. Future studies should be done among those admitted in intensive care units and the relationship of smoking and COVID-19 related mortality needs to be studied further.

CONCLUSION

The present study showed that there is no strong evidence to suggest that there is a direct association between smoking and COVID-19 mortality and severity of disease progression. This study was done among the COVID-19 patients admitted in the wards. Similar study in future should be undertaken among COVID-19 patients admitted in intensive care unit to get better clarity between smoking and COVID-19 mortality.

ACKNOWLEDGMENT

The authors would like to acknowledge all the medical and paramedical staffs of Zoram Medical College, Mizoram who have contributed in times of COVID-19 Pandemic.

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JRR - Concept and design of the study, coordination, review of literature, and preparation of manuscript; **LH -** Concept of study, interpreted the results, data collection, data entry, and questionnaire; **LtS -** Concept and manuscript preparation; **GSA -** Concept, study design, coordination, and interpretation, review of literature, preparation of manuscript, and revision of the manuscript; **LmS -** Concept, review of the manuscript, manuscript preparation, and coordination; **LR -** Concept, and manuscript preparation.

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Source of Funding: Nil, **Conflicts of Interest:** None declared.