

Effect of Smoking on COVID-19 Severity

Hussein A. A. Al-Baka*, Doaa N. M. Al-Debi

College of Medical and Health Techniques. University of Alkafeel, Najaf, Iraq

Received: 13th August, 2021, Revised: 27th October, 2021, Accepted: 13th November, 2021, Available Online: 25th December, 2021

ABSTRACT

It is proven that smoking leads to the development of many serious diseases. In this study, we tried to show a relation between tobacco smoking and COVID-19 severity. We collected 198 COVID-19 patients reports from 4 hospitals. The patients were 151 men, 93 of them smokers, and 47 women, 11 smokers. The patients were suffering severe symptoms and were hospitalized for different periods. Some of them were admitted to intensive care units, and sometimes ventilators were necessary and used. Among the men, 4 smokers and 1 nonsmoker died. At the same time, 2 smoker women and 1 nonsmokers died. The results have been subjected to statistical analysis, and there were significant differences in the percentage of deaths.

Keywords: COVID-19, Severity, Statistical analysis, Tobacco smoking, Ventilators.

International Journal of Drug Delivery Technology (2021); DOI: 10.25258/ijddt.11.4.71

How to cite this article: Al-Baka HAA, Al-Debi DNM. Effect of Smoking on COVID-19 Severity. International Journal of Drug Delivery Technology. 2021;11(4):1527-1529.

Source of support: Nil.

Conflict of interest: None

INTRODUCTION

For the first time in late 2019 coronavirus disease (COVID-19) was declared in Wuhan, China. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was the cause of the disease.¹ The World Health Organization (WHO) announced COVID-19 as Public Health Emergency of International Concern. A severe acute respiratory syndrome is a ribonucleic acid (RNA) virus family that includes Middle East respiratory syndrome and SARS.² COVID-19 is with an elevated risk of transmission from human to human.³ Smoking is the primary cause of lung diseases, cardiovascular problems, diabetes, cancer, and hypertension. So it is not surprising that tobacco stands as the evident cause behind a high percentage of deaths every year.⁴ Smoking stimulates the appearance of respiratory disease by the following mechanisms: enhance mucosal permeability, inhibit ciliary clearance, alters airway architecture, and disrupt respiratory epithelium. It is established that tobacco increases viral infection and bacterial diseases, like tuberculosis, Influenza, and the common cold.⁵ Tobacco was a predisposing factor for Middle East respiratory syndrome coronavirus infection.⁶ All organs of the human body are harmed by smoking, which initiates different diseases, and smokers health is badly influenced in general.⁷ Smoking is the factor that leads to more deaths than all the following factors combined: illegal drug use, firearm-related incidents, motor vehicle injuries, human immunodeficiency virus, alcohol.⁸ Nearly 90% of deaths by lung cancer are caused by tobacco smoking.⁹ Deaths of women due to breast cancer are less than from lung cancer.¹⁰ Many observational studies observed that about 1.4 to 18.5% of hospitalized adults of COVID-19 patients

were smokers.^{11,12} Several statistical studies found significant association COVID-19 severity and smoking.¹³ Other statistical studies showed a significant relationship between tobacco and use of a ventilator, admission to intensive care unit, and death.¹⁴ There are many studies have found the smokers expose worse outcomes when infected by COVID-19.¹⁵

MATERIALS AND METHODS

In this study, we looked at databases of 4 hospitals and collected reporters about 520 COVID-19 patients who were hospitalized for different periods, some of them admitted into intensive care units and used ventilators. We excluded the patients' reports pre-suffering any of the following health problems: cardiovascular, hypertension, respiratory diseases, obesity, diabetes, severe vitamin D deficiency, and chronic urinary troubles. Accordingly, 322 reports have been left aside, and the rest 198 reports were subjected to the study.

Design of Study

As its presented in Table 1, 198 reports of COVID-19 patients were carefully considered and divided into a male group with 151 patient reports and a female group with 47 patient reports. Then each group was divided into two subgroups as smokers and nonsmokers as following.

- Men group 151 patients: smoker subgroup with 93 patients and nonsmoker subgroup 58 patients.
- Women group 47 patients: smoker subgroup with 11 patients and nonsmoker subgroup 36.

All the patients suffered severe COVID-19 symptoms. The following criteria determine COVID-19 is severe: 1- oxygen saturation $\leq 93\%$, 2- respiratory rate ≥ 30 /minute, 3- arterial

*Author for Correspondence: hussein.abdullah@alkafeel.edu.iq

Table 1: Distribution of patients

Groups	Smoker	Nonsmoker	Total
Men	93	58	151
Women	11	36	47
Total	104	94	198

Table 2: Death and survivals in each group

Groups	Smoker		Nonsmoker		Total
	Death	Survivals	Death	Survivals	
Men	4 a	89 b	1c	57 d	151
Women	2 e	9 f	1 c	35 h	47
Total	6	98	2	92	198

Different small letters refer to significant differences at level $p \leq 0.05$

Table 3: Percentage of death in each group

Group	Percentage of death smoker	Percentage of death nonsmoker	Percentage of all death
Men	4.3%. a	1.72% b	2.64% c
Women	18.18% d	2.77 % e	6.38% f

Different small letters refer to significant differences at level $p \leq 0.05$

partial pressure of oxygen (PaO_2)/fraction of inspiration oxygen (FiO_2) ≤ 300 mm Hg, 4- intensive care unit admission, 5- implementation of mechanical ventilation, 6-shock, 7-progression of lung lesions progressed $>50\%$ within 24 to 48 hours.¹⁶

Statistical analysis

The Chi-square test was used for statistical analysis. p -value less than 0.05 was taken significantly. SPSS version 22 has been used for all statistical analyses.

RESULTS

As its clear in Table 2, Four individuals of smoker men died, while one patient of nonsmoker men died, so the percentage of death amongst the smoker was 4.3%, and among the nonsmoker was 1.72%. The death was significantly higher in the subgroup of smokers.

Table 3 reefer to the percentage of death as follow. Two women died among the smoker, with a relatively high percentage of death (18.18%). One woman who died from the nonsmoker formed 2.77% of death. The percentage was significantly higher among the smoker women.

DISCUSSION

Some studies confirmed the relationship between COVID-19 severity and smoking.^{17,18} It is known that smoker individuals are in general more susceptible to bacterial and viral infection.¹⁹ Other studies indicated and considered smoking plays a risk role in the transmission of COVID-19 due to repeated contact among lips, cigarettes, and fingers.²⁰ Sneezing and coughing stimulated by smoking could produce aerosols hold SARS-CoV-2 causing the spread COVID-19.²¹

This study succeeded in confirming the relationship between smoking and the severity of COVID-19. The results were expected because, typically, smoking weakens the defensive immune system of the body.

CONCLUSION

Smoking has a remarkable effect on the severity of COVID-19, and the condition of smoker patients worsens. The problem that faced this study was that many patients had not been asked if they were smokers. We excluded them and lost considerable data. Even though we think our findings were quite accurate and dependable. We would have enlarged the sample size if it was possible. It was also difficult to get a sample of secondhand smokers.

REFERENCES

- Cucinotta, D., and Vanelli, M.. Who declares COVID-19 a pandemic. *Acta Biomed.* 2020;91:157-160. Available from: doi.org/doi: 10.23750/abm.v91i1.9397.
- Zhou, F., Yu, T., Du, R., Fan, G., Liu, Y., Liu, Z. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in wuhan, china: a retrospective cohort study. 2020;395:1054-1062. Available from: doi.org/doi: 10.1016/s0140-6736(20)30566-3.
- Chan JF, Yuan S, Kok K H, To KK, Chu H, Yang J. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. 2020;95:514-523. Available from: doi.org doi: 10.1016/s0140-6736(20)30154-9.
- Global Burden of Disease: GBD Compare Tool, (Available from: April 27 2020 <https://vizhub.healthdata.org/gbd-compare/>).
- Arcavi L. & Benowitz NL. Cigarette smoking and infection. *Arch. Intern. Med.* 2004;164:2206-2216. Available from: doi.org/10.1001/archinte.164.20.2206.
- Alraddadi BM. et al. Risk factors for primary Middle East respiratory syndrome coronavirus illness in humans, Saudi Arabia, 2014;22:49-55. Available from: doi.org/10.3201eid2201.151340.
- U.S. Department of Health and Human Services. How Tobacco Smoke Causes Disease: What It Means to You. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2010;1993;270(18):2207-2212. Available from: doi.org/doi:10.1001/jama.1993.03510180077038
- Centers for Disease Control and Prevention. QuickStats: Number of Deaths from 10 Leading Causes—National Vital Statistics System, United States, 2010. *Morbidity and Mortality Weekly Report* 2013;62(08);155. 2016;65(45), November 18.
- Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual Causes of Death in the United States. *JAMA: Journal of the American Medical Association* 2004;291(10):1238-1245 Available from: doi.org/10.1001/jama.291.10.1238
- U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014;[accessed 2017 Apr 20].
- U.S. Department of Health and Human Services. Women and Smoking: A Report of the Surgeon General. Rockville (MD): U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General, 2001;[accessed 2017 Apr 20].
- Chen Q, Zheng Z, Zhang C, Zhang X, Wu H, Wang J, et al. Clinical characteristics of 145 patients with corona virus disease 2019 (COVID-19) in Taizhou, Zhejiang, China. *Infection*,

- 2020;Apr 28:1-9. Available from: doi.org/10.1007/s15010-020-01432-5
13. Zhu W, Xie K, Lu H, Xu L, Zhou S, Fang S. Initial clinical features of suspected coronavirus disease 2019 in two emergency departments outside of Hubei, China. *Journal of medical virology*. 2020 Sep;92(9):1525-1532. Available from: doi.org/10.1002/jmv.25763
 14. Zheng Z, Peng F, Xu B, Zhao J, Liu H, Peng J, Li Q, Jiang C, Zhou Y, Liu S, Ye C. Risk factors of critical & mortal COVID-19 cases: A systematic literature review and meta-analysis. *Journal of infection*. 2020 Aug 1;81(2):e16-25. Available from: doi.org/10.1016/j.jinf.2020.04.021
 15. Vardavas CI, Nikitara K. COVID-19 and smoking: A systematic review of the evidence. *Tobacco induced diseases*. 2020;18(March):20. Available from: doi.org/10.18332/tid/119324 .
 16. National health commission, and National administration of traditional Chinese medicine. Diagnosis and treatment of new coronavirus pneumonia (trial sixth edition). *Chin. J. Viral Dis*. 2020;10:1-5.
 17. van Zyl-Smit, R. N., Richards, G., and Leone, F. T. Tobacco smoking and COVID-19 infection. *Lancet Respir. Med*. 2020;8: 664-665. Available from: doi.org/10.1016/s2213-2600(20)30239-3
 18. Kaur, G., Lungarella, G., and Rahman, I. Sars-cov-2 COVID-19 susceptibility and lung inflammatory storm by smoking and vaping. *J. Inflamm*. 2020;17:21. Available from: doi.org/10.1186/s12950-020-00250-8
 19. Archie SR, Cucullo L. Cerebrovascular and neurological dysfunction under the threat of COVID-19: is there a comorbid role for smoking and vaping?. *International journal of molecular sciences*. 2020 Jan;21(11):3916. Available from: doi.org/10.3390/ijms21113916
 20. Sabino-Silva R, Jardim AC, Siqueira WL. Coronavirus COVID-19 impacts to dentistry and potential salivary diagnosis. *Clinical oral investigations*. 2020 Apr;24(4):1619-21. Available from: doi.org/10.1007/s00784-020-03248-x
 21. Ma J, Qi X, Chen H, Li X, Zhang Z, Wang H, Sun L, Zhang L, Guo J, Morawska L, Grinshpun SA. Coronavirus Disease 2019 Patients in Earlier Stages Exhaled Millions of Severe Acute Respiratory Syndrome Coronavirus 2 Per Hour. *Clinical Infectious Diseases*. 2021 May 15;72(10):e652-e654.