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SMOKERS ARE MORE SUSCEPTIBLE TOWARDS COVID-19 INFECTION



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Abstract

Smoking is one of the major causes of mortality worldwide. Smokers are more prone to pulmonary infections resulting acute respiratory failure and reported to have higher mortality rates in the previous outbreak of Middle East Respiratory Syndrome Corona virus (MERS-CoV). A statistically significant association was found between smoking and severity of severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) outcomes among patients, including Intensive Care Unit (ICU) admission, use of ventilator or death. This association was further confirmed by the increased expression of angiotensin-converting enzyme-2 (ACE2) receptor among smokers which is a novel adhesion site of SARS-CoV-2 causing COVID-19 infection in human.

Conclusion: This article highlights the need of identifying the demographic risk and status of smoking among the patients reported to have SARS-CoV-2 infection because these patients are more likely to develop severe signs and symptoms leading to fatality and need to be prioritized for critical treatment by clinical practitioners. Health authorities should promote awareness programs on smoking prevention in parallel with the recent COVID-19 precautionary campaigns.

Keywords: Smoking, Covid-19, Pandemic, SARS-CoV-2

INTRODUCTION

The current pandemic of COVID-19 is not the only reason which is causing fatality due to the respiratory failure. According to World Health Organization (WHO), 8 million tobacco related deaths is reported each year worldwide (1). Among them, more than 7 million are the result of direct tobacco consumption while around 1.2 million premature deaths are the result of passive smoking (2). Some popular modes of smoking include traditional cigarettes, water pipe as well as the recent alternatives such as electronic cigarettes and “heat-not-burn” IQOS devices (3). These modish devices are not safe either with nearly similar side-effects as compared to the conventional cigarettes (4). However, the role of smoking in either the transmission or vulnerability of smokers towards the novel corona virus was considered very less.

As the studies related to novel COVID-19 are progressively reported, the researchers are pointing out that the tobacco users are at higher risk of the SARS-CoV-2

infection, as compared to non-smokers (5, 6). They are more susceptible to bacterial and viral respiratory infections showing the double rate of infection with influenza and increased rates with tuberculosis and pneumonia (1, 3, 7). Earlier studies have shown that smokers have higher mortality rates in the previous Middle East Respiratory Syndrome Coronavirus (MERS-CoV) outbreak (1).

A brief report by WHO published on May 26, 2020 summarized 27 observational studies which found that smokers constituted 1.4-18.5% of hospitalized adults with COVID-19 (8). Additionally, the report highlights statistically significant association between smoking and severity of SARS-CoV-2 outcomes among patients, including admission to Intensive Care Unit (ICU), ventilator use or death. Still, more peer-reviewed studies are required to quantify the risk of hospitalization or infection by SARS-CoV-2 to smokers (8).

It was discovered that smoking upregulates angiotensin-converting enzyme-2 (ACE2) receptor which is also popularly known as a novel adhesion site for SARS-CoV-2 causing COVID-19 with the significantly higher binding affinity of virus in human cells than the previous SARS-CoV (3). Consequently, it should be considered as a bridging factor between smoking and COVID-19. Relatively higher gene expression levels of ACE2 were reported in the samples taken from smokers as compared to never-smokers which could aid the virus to proliferate, invade and mutate inside the host cell system resulting in acute respiratory failure which is a leading cause of fatality in COVID-19 (3). This was also observed in the patients of chronic obstructive pulmonary disease (COPD) and idiopathic pulmonary fibrosis (3). Hence, in a current COVID-19 pandemic, it is suggested to prioritize smokers while providing immediate medical attention and accommodation in ICU or ventilators due to their higher possibility of mortality.

The co-morbidities associated with smoking, including diabetes and cardiovascular disease are another aspect which is already linked to the recent SARS-CoV-2 case severity (9, 10) but still smoking has been given less prominence when clinically correlating. Therefore, it is recommended to the health authorities to implement a mandatory procedure in the clinical practices to find the detailed history and smoking status of identifying COVID-19 patients. It may be a useful strategy to identify the death rate of COVID-19 that could have been aggravated by the consumption of tobacco, compared to non-smokers. Since the rate of smoking varies population wise, it is suggested that this data will be very supportive in concluding demographic risk to the smokers to contract and transmit SARS-CoV-2 than non-smokers. The countries having higher smoking rates could possibly have the increased number of COVID-19 positive cases and mortalities. The countries like China with a high male smoking rate of overall 44.8% population (11), USA with 14% smoking prevalence in adults only (12), 19.3% prevalence in Korea (13), 32% in France (14) and 14.4% of the overall population in the UK (15) are among those countries having increased numbers of COVID-19 positive cases and mortalities initially. However, evidence-based studies and other factors need to be investigated further to

identify the association of smoking with SARS-CoV-2 case severity, but smoking is most likely associated with the adverse outcomes of COVID-19. For that reason, the vulnerable communities should be specifically treated with improved policies and advanced standard operating procedures (SOPs). This could benefit the clinical practitioners to have a clearer understanding of the severity of the cases and help them in aiming the related complexities and timely prevention of the COVID-19 fatalities.

There is a desperate need to promote awareness programs in parallel with the recent ongoing COVID-19 precautionary campaigns all over the world to highlight the fact that smoking is not less lethal than an outbreak and it is the right time to quit the use of tobacco to survive in current pandemic situation. A strong narrative should be stated by health authorities that protecting your respiratory system from tobacco is equally important as taking precautionary measures from recent SARS-CoV-2 infection to survive and live a healthy lifestyle. For this, the concerned authorities should use the selected media sources for such campaign's outreach to mass public, emphasizing on the susceptibility of smokers towards the adverse conditions including intubation, ICU admission and mortality.

References:

1. Vardavas CI, Nikitara K. COVID-19 and smoking: A systematic review of the evidence. *Tobacco induced diseases*. 2020;18.
2. Xia Y, Wu Q, Wang H, Zhang S, Jiang Y, Gong T, et al. Global, regional and national burden of gout, 1990–2017: a systematic analysis of the Global Burden of Disease Study. *Rheumatology*. 2020;59(7):1529-38.
3. Brake SJ, Barnsley K, Lu W, McAlinden KD, Eapen MS, Sohal SS. Smoking upregulates angiotensin-converting enzyme-2 receptor: a potential adhesion site for novel coronavirus SARS-CoV-2 (Covid-19). Multidisciplinary Digital Publishing Institute; 2020.
4. Sohal S, Eapen M, Naidu V, Sharma P. IQOS exposure impairs human airway cell homeostasis: direct comparison with traditional cigarette and e-cigarette. *ERJ Open Res*. 2019; 5 (1): 00159-2018.
5. Koczkodaj P, Cedzyńska M, Didkowska J. Smoking and SARS-CoV-2: Are Polish health professionals at higher risk of infection? *Tobacco Induced Diseases*. 2020;18.
6. Leung JM, Yang CX, Tam A, Shaipanich T, Hackett T-L, Singhera GK, et al. ACE-2 expression in the small airway epithelia of smokers and COPD patients: implications for COVID-19. *European Respiratory Journal*. 2020;55(5).
7. Lawrence H, Hunter A, Murray R, Lim W, McKeever T. Cigarette smoking and the occurrence of influenza—Systematic review. *Journal of Infection*. 2019;79(5):401-6.
8. Organization WH. Smoking and COVID-19: scientific brief, 26 May 2020. World Health Organization, 2020.
9. Li B, Yang J, Zhao F, Zhi L, Wang X, Liu L, et al. Prevalence and impact of cardiovascular metabolic diseases on COVID-19 in China. *Clinical Research in Cardiology*. 2020;109(5):531-8.
10. Ceriello A, Schnell O. COVID-19: Considerations of Diabetes and Cardiovascular Disease Management. *Journal of diabetes science and technology*. 2020:1932296820930025.
11. Zhi K, Wang L, Han Y, Vaughn MG, Qian Z, Chen Y, et al. Trends in cigarette smoking among older male adults in China: An urban–rural comparison. *Journal of Applied Gerontology*. 2019;38(6):884-901.
12. Creamer MR, Wang TW, Babb S, Cullen KA, Day H, Willis G, et al. Tobacco product use and cessation indicators among adults—United States, 2018. *Morbidity and Mortality Weekly Report*. 2019;68(45):1013.

13. Chang Y, Kang H-Y, Lim D, Cho H-J, Khang Y-H. Long-term trends in smoking prevalence and its socioeconomic inequalities in Korea, 1992–2016. *International journal for equity in health*. 2019;18(1):148.
14. Andler R, Richard J, Guignard R, Quatremère G, Verrier F, Gane J, et al. Baisse de la prévalence du tabagisme quotidien parmi les adultes: résultats du Baromètre de Santé publique France 2018. *Bull Epidemiol Hebd*. 2019;15:271-7.
15. Statistics OfN. Smoking habits in the UK and its constituent countries. 2018.