DOES SMOKING STATUS IMPACT THE SEVERITY OF ACUTE COVID-19?

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Dear Editor,

Since December 2019 the whole world's focus has been on coronavirus disease 2019 (COVID-19), socially, economically, and especially medically. The pandemic and resulting social restriction, isolation, lockdown, and economic crisis have radically changed people's everyday lives and routines. On the other side, professionals are still trying to understand exact pathophysiological mechanisms, diagnostic and therapeutic protocols. Although some entities, like older age, several comorbidities, and immunodeficiencies, are recognized as strong risk factors (NIH treatment guidlines 2021), the interaction between severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and many other patient characteristics is still unknown. One of the most intriguing areas is the smoking-SARS-CoV-2 correlation since there are many contradictory and potentially "dangerous" data. Tobacco smoking is a known risk factor for numerous chronic diseases, respiratory, cardiovascular diseases, diabetes, cancer, etc (Wang et al. 2020). Due to smoking's immunosuppressive effects, smokers are at greater risk for infections (Wang et al. 2020). All of this would logically lead to the conclusion that smokers are at great risk for COVID-19, however, available data are conflicting. Although some authors reported an increased risk of COVID-19 (including more severe forms of illness and high mortality rate) among smokers, others found a "protective effect" of smoking (Tattan-Birch et al. 2020, Eakin & Neptune 2021).

Here we retrospectively analyzed the post-COVID-19 register of University Hospital Zagreb, Clinic for Pulmonary Diseases Jordanovac in Croatia to compare COVID-19 incidence between smokers and nonsmokers. The total of 547 patients was divided into three groups, never smokers (never smoked, or smoked <100 cigarettes), former smokers (smoked >100 cigarettes, quit smoking more than 3 months ago), and current smokers. Further, the severity of illness was compared between the groups, according to the disease severity scale of the Croatian Ministry of Health. Out of 547 patients, 501 patients had data on smoking, 315 patients (63%) were non-smokers, 44 (9%) former smokers, and 142 (28%) current smokers, respectively. Out of 544 patients with available data on disease severity, 188 (35%) had mild disease, 257 (47%) moderately severe, 80 (15%) severe, and 19 (3%) critical disease. Among patients with mild disease, 108 (57%) patients were non-smokers, 43 (23%) former

smokers, and 24 (13%) current smokers. In moderately severe illness, 159 (62%) were non-smokers, 59 (23%) former smokers, and 15 (6%) current smokers. Thirty-nine (49%) patients with severe illness were non-smokers, 32 (40%) were former smokers, while 4 (5%) were smokers. Among patients with critical illness, 9 (47%), 5 (26%), and 1 (5%) were non-smokers, former smokers, and current smokers, respectively.

The correlation between COVID-19 and smoking is complex and yet to be elucidated. In our study, although non-smokers predominated, most of them (84.8%) had a mild or moderately severe illness. Still, no significant differences among smokers and non-smokers were found regarding the severity of the disease. Given the complexity of COVID-19 and different and unknown underlying factors contributing to the development of severe and critical illness, better-structured studies are needed to define SARS-CoV-2 and tobacco consumption interaction and prevent the public's misinterpretation of the results. Medical professionals should bear in mind that smoking is a preventable disease-causing almost 7 million deaths annually (Clancy et al. 2020). Further, we should keep in mind that COVID-19 has negatively impacted people's mental health, especially for those who already suffered from mental health illness, particularly addictions (Caponnetto et al. 2020). During the pandemics, many people, even those without mental health disorder history, have reported symptoms of depression, anxiety, sleeping, and eating disorders (Caponnetto et al. 2020). There have also been reports on increased alcohol, tobacco, and other substance consumption, mostly as a distraction of pandemic stress, fear, and worries (Caponnetto et al. 2020). In this context, medical professionals have to be extremely cautious in reports about smoking behavior before the onset of COVID-19. For the last year, people have been extremely labile and sensitive, due to living in the fear of getting infected (from other people), sick, and even death, in a world where there is still no effective cure for COVID-19, and where the only semi-effective method to protect ourselves is social distancing, including distancing from our families and friends. Consequently, people are seeking ways to ease this situation, some of them are reaching for substance abuse, including tobacco. If we supply people with (yet unproven) information that smoking has a protective effect on COVID-19, it could have enormous and serious consequences on global health. COVID-19 should be used as a chance to educate the public about adaptive, healthy stress-release methods and the necessity for smoking cessation, to prevent and preserve overall physical and psychical health.

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