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The role of smoking status in COVID-19 infection and severity in Sweden – an analysis of a Swedish chronic disease register-based cohort.

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Background: The impact of smoking on COVID-19 has been controversial due to conflicting evidence on its effects on the incidence and severity of the infection.

Objectives: To investigate the effect of smoking status on COVID-19 infection, hospitalization, intensive care unit (ICU) admission, and death in patients from four Swedish chronic disease registers.

Methods: We included all individuals in the Swedish population with registered information on smoking status during 2019 from four Swedish National chronic disease Registers: Airways, Diabetes, Heart failure and Heart disease. We identified four COVID-19 outcomes from 1 Jan 2020 until 31 Dec 2021: infection (test-positive and/or healthcare encounter), hospitalization, ICU admission and death. Using logistic regression, we analyzed associations between smoking status and COVID-19 outcomes as odds ratios (aOR) with 95% confidence intervals (95%CI) adjusted for baseline socio-demographics, body mass index, comorbidities, and pharmacological treatment.

Results: The population-based cohort comprised 506,755 subjects, of whom 13.0% were current and 86.9% were non-current smokers (54.7% never and 32.2% former). During follow-up, 51163 (8.8%) COVID-19 infections, 12646 (2.2%) hospitalizations, 1622 (0.3%) ICU admissions, and 2760 (0.5%) COVID-19 deaths occurred. Compared to never smokers, current smokers had lower risk of COVID-19 infection (aOR 0.66, 95%CI 0.64-0.69), hospitalization (0.62, 0.57-0.66), ICU admission (0.46, 0.37-0.57), and death (0.83, 0.70-0.98), while former smokers had a significantly higher risk of COVID-19 death (1.21, 1.11-1.33). Similar results were seen when current smokers were compared to non-current smokers.

Conclusion: This study provides population-based data suggesting that former smokers have a higher risk of COVID-19 death than never smokers, while current smokers seem to have a lower risk of severe outcomes than both non-current and never smokers.