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Original Article

Intranasal Corticosteroids Are Associated with Better Outcomes in Coronavirus Disease 2019

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Background

Sites of entry for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are highly expressed in nasal epithelial cells; however, little is known about the impact of intranasal corticosteroids (INCS) on coronavirus disease 2019 (COVID-19)-related outcomes.

Objective

To determine the association between baseline INCS use and COVID-19-related outcomes.

Methods

Using the Cleveland Clinic COVID-19 Research Registry, we performed a propensity score matching for treatment with INCS before SARS-CoV-2 infection (April 1, 2020, to March 31, 2021). Of the 82,096 individuals who tested positive, 72,147 met inclusion criteria. Our endpoints included the need for hospitalization, admission to the intensive care unit (ICU), or in-hospital mortality.

Results

Of the 12,608 (17.5%) who were hospitalized, 2935 (4.1%) required ICU admission and 1880 (2.6%) died during hospitalization. A significant proportion (n = 10,187; 14.1%) were using INCS before SARS-CoV-2 infection. Compared with nonusers, INCS users demonstrated lower risk for hospitalization (adjusted odds ratio [OR] [95% confidence interval (CI)]: 0.78 [0.72; 0.85]), ICU admission (adjusted OR [95% CI]: 0.77 [0.65; 0.92]), and in-hospital mortality (adjusted OR [95% CI]: 0.76 [0.61; 0.94]). These findings were replicated in sensitivity analyses where patients on inhaled corticosteroids and those with allergic rhinitis were excluded. The beneficial effect of INCS was significant after adjustment for baseline blood eosinophil count (measured before SARS-CoV-2 testing) in a subset of 30,289 individuals.

Conclusion

INCS therapy is associated with a lower risk for COVID-19-related hospitalization, ICU admission, or death. Future randomized control trials are needed to determine if INCS reduces the risk for severe outcomes related to COVID-19.

Previous Next

Key words

SARS-CoV-2; COVID-19; Intranasal corticosteroids; Asthma; Eosinophilia

Abbreviations used

ACE2, Angiotensin-converting enzyme 2; AEC, Absolute eosinophil count; BMI, Body mass index; CCCRR, Cleveland Clinic COVID-19 Research Registry; CI, Confidence interval; COPD, Chronic obstructive pulmonary disease; COVID-19, Coronavirus disease 2019; EHR, Electronic health records; iCS, Inhaled corticosteroids; ICU, Intensive care unit; INCS, Intranasal corticosteroids; IQR, Interquartile range; MICE, Multivariate Imputation by Chained Equations; OR, Odds ratio; PS, Propensity score; RCT, Randomized controlled trial; S, Spike; SARP, Severe asthma research program; SARS-CoV-2, Severe acute respiratory syndrome coronavirus 2; TMPRSS2, Transmembrane serine protease 2

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Conflicts of interest: The authors declare that they have no relevant conflicts of interest.

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