

Risk and outcomes of COVID-19 in patients with long-term oxygen therapy – a national cohort study

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Background

We aimed to evaluate cumulative occurrence and impact of COVID-19 in patients with chronic respiratory failure (CRF) treated with long-term oxygen therapy (LTOT).

Material and methods

Data were obtained from the SCIFI-PEARL study on the entire Swedish population and on patients with oxygen-dependent CRF and no COVID-19 diagnosis before start of LTOT. Analyses were performed for three time periods; pre-alpha (Jan-Dec 2020), alpha (Jan-Mar, 2021) and delta/omicron (Apr 2021-May 2022). Cumulative incidence of laboratory-verified COVID-19 was compared between patients with CRF and the general population. Risk factors for moderate (hospitalized) to severe (intensive care, or death ≤ 30 days after infection) COVID-19, and the impact of COVID-19 on one-year mortality, were analyzed using multivariable Cox regression.

Results

Cumulative incidence of COVID-19 was higher in patients with CRF than in the general population during the pre-alpha period (6.4%/4.9%, $p = 0.002$), but less common during the alpha and delta/omicron periods (2.9%/3.8% and 7.8%/15.5%, $p < 0.0001$ for both). The risk of moderate/severe COVID-19 was much higher in CRF patients during all periods (4.9%/0.5%, 3.8%/0.2% and 15.5%/0.5%, $p < 0.0001$ for all). Risk factors for COVID-19 infection in people with CRF were higher age, cardiovascular disease and renal disease, and COVID-19 was associated with increased one-year mortality following infection in the pre-alpha (HR 1.79; [95% CI] 1.27-2.53) and alpha periods (1.43; 1.03-1.99).

Conclusion

Patients with oxygen-dependent chronic respiratory failure had higher risk for moderate/severe COVID-19 than the general population. COVID-19 was associated with excess one-year mortality.