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Ward-based high-flow nasal cannula oxygen
for acute lower respiratory tract infection

Pulmonary Research Inter-Site Matrix (PRISM) South West *

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High-flow nasal cannula (HFNC) oxygen therapy utilises an air/oxygen blender to deliver heated and humidified oxygen at flows of up to 60 L/min via nasal cannula. Use of HFNC oxygen delivery for adult patients with acute respiratory failure is well established, however current evidence commonly combines outcomes from medical inpatients with those in peri-operative and critical care settings (O'Driscoll et al. 2017). Details of use and outcomes from ward based HFNC oxygen remains uncertain, particularly in those with lower respiratory tract infection. The authors conducted a regional clinical service evaluation, collecting data from adult medical inpatients commenced on HFNC oxygen to determine outcomes for those with LRTI.

Inpatients aged ≥ 18 years who had been commenced on HFNC oxygen on medical wards (i.e. not in an intensive care, high dependency, theatre or emergency department setting) during a six-week period from December 2018 to January 2019 were identified from nine hospitals in the South West of England. Baseline data were recorded within 24 hours of HFNC initiation and included patient demographics, primary diagnosis, reason for HFNC use, arterial blood gas results and details of oxygen delivery prior to HFNC. Follow-up and mortality data were collected from patient records 30-days after HFNC oxygen initiation. Data were collected by members of the PRISM respiratory trainee research network.

Of the 45 patients commenced on HFNC on a medical ward during this period, lower respiratory tract infection and associated hypoxemic respiratory failure was the most common indication (28/45, 62%). Amongst these, median age was 68 years (range 23-91) and 64% (18/28) were men. All cause 30-day mortality was 32% (9/28) with all nine patients dying during their hospital admission. Of 15 patients eligible for escalation to critical care, three required mechanical ventilation (20%). Mortality among patients not eligible for escalation to

critical care was 46% (6/13). Four patients (14%) did not have a treatment escalation plan in place at the time HFNC was commenced. Fifteen patients (54%) commenced HFNC oxygen on respiratory wards, ten patients (36%) on acute medical units and three patients (11%) on other medical wards. Senior physicians (consultants or registrars) were consulted when starting HFNC in 23/28 (82%) patients.

In this patient cohort, requirement for ward-based HFNC oxygen for acute LRTI was associated with significant mortality and risk of requiring invasive mechanical ventilation (where suitable). The authors highlight that treatment escalation planning decisions, alongside informed discussion with patients and relatives, are a necessary consideration prior to initiation of ward-based HFNC oxygen for acute LRTI. These observational results require confirmation in larger studies. A national consensus guideline on the use of high-flow nasal cannula oxygen would help to ensure a standardised approach toward patient selection, particularly given uncertainties regarding its use during the COVID-19 pandemic.

Local understanding of service delivery is essential to improve patient outcomes. In addition to better documentation of treatment escalation plans, considerations for future quality improvement projects include optimising treatment location (as highlighted in a recent national patient safety alert (National Patient Safety Alerting Committee 2020)), consistent involvement of senior decision makers when commencing high-flow nasal cannula oxygen, education on recognising patients likely to fail HFNC therapy and early involvement of intensive care or palliative care teams where appropriate.

References

1. O’Driscoll BR, Howard LS, Earis J, et al. 2017. BTS guideline for oxygen use in adults in healthcare and emergency settings. Thorax. 72:ii1–90.
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