ICU
MANAGEMENT & PRACTICE

Closed-Loop Oxygen Control in Patients With AHRF

High flow nasal oxygen (HFNO) has many physiological benefits in patients with acute hypoxaemic respiratory failure (AHRF). It can also help reduce the need for intubation. However, optimal flow settings are unknown and are generally based on expert recommendations.

Maintaining oxygenation within a given target range requires intensive patient monitoring and frequent manual adjustment of the fraction of inspired oxygen (FiO_2). This can be time-consuming and sometimes difficult to manage in times of staff shortages.

Closed-loop oxygen delivery with automatic oxygen titration is associated with more time spent within the SpO2 target range in patients admitted to the emergency department, those with chronic respiratory disease, surgical patients after extubation and patients wearing from invasive ventilation.

A study was conducted to assess the efficacy of a closed-loop oxygen control in critically ill patients with moderate to severe AHRF treated with HFNO.

Forty-five adult patients with moderate to severe AHRF were included in the final analysis. Patients were treated with HFNO and were randomly assigned to either start with a 4-h period of closed-loop oxygen control or a 4-h period of manual oxygen titration. Patients were switched to alternate therapy after.

The primary outcome of the study was the percentage of time spent in an optimal SpO_2 range. Secondary outcomes were percentage of time spent in suboptimal ranges, time spent out of range, percentage of time with SpO_2 signal available, mean SpO_2, SpO_2/FiO_2, and the ROX index, percentage of time with SpO_2 below 88% and 85% and the number of events of SpO_2 below 88% and 85%.

Findings of the study show that patients in the closed-loop oxygen group spent more time in the optimal SpO_2 range compared with those managed with manual titrations of oxygen. Patients also spent less time in the suboptimal range with closed-loop oxygen control and less time above the suboptimal range. In addition, fewer number of manual adjustments were needed per hour in the closed-loop oxygen group. However, the number of events of SpO_2 <88% and <85% were not significantly different between the two groups.

These findings show that closed-loop oxygen control improves oxygen administration in patients with moderate to severe AHRF treated with HFNO. Closed-loop oxygen administration also increases the percentage of time in the optimal oxygenation range and decreases the workload of healthcare workers.

Source: Critical Care

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Published on : Tue, 19 Apr 2022