ICU
MANAGEMENT & PRACTICE

Severe Hyperoxaemia Events and Mortality Among Patients in PICU

The paediatric management of hyperoxaemia (also defined as high PaO_2 or arterial oxygenation of greater or equal to 300mmHg) has so far yielded conflicting results. For multiple studies in adults, hyperoxaemia has been shown as an independent risk factor for mortality after cardiac arrest.

It was the purpose of a recent study to analyse the relationship between high PaO_2 values and poor outcomes to see if the association between these two factors is causal. Researchers, therefore, studied severe PICU hyperoxaemia cases to assess the connection to mortality.

The study evaluated 23719 PICU encounters between the years 2009 and 2018 in a children's hospital. From the arterial blood gas measurements, logistic regression models were used to assess the links between high PaO_2 values and mortality.

It was found that 6250 patients (56.6%) of those studied had a minimum of one severe PaO_2 measurement. After analysis, it was confirmed that there is an independent association between severe hyperoxaemia events and mortality amongst PICU patients.

The results also showed that there was a possible exposure-response association between these two factors, with the risk of mortality increasing with the number of severely hyperoxaemic values recorded for the patient. As one high PaO_2 measurement showed an increased risk of death, with this risk increasing for three or more PaO_2 values recorded between three hours of each other. Due to the sensitivity analysis performed in the study, the findings seem to be robust, however, future research should include a randomised trial.

Conclusions drawn from the study could influence future guidelines on the effects of supratherapeutic oxygen levels in critically ill children. However, whilst these results show the association between severe hyperoxaemia and poor outcomes in PICU patients, there is still a need to thoroughly evaluate this relationship.

Source: JAMA Network Open
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