CORRESPONDENCE

Authors’ response: hyperoxia in acute asthma

We appreciate the comments by Snelson and Tunnicliffe regarding our study of the effects of high concentration oxygen therapy in acute exacerbations of asthma. We concur with the view that the effect of high concentration oxygen therapy on arterial carbon dioxide pressure ($\text{PaCO}_2$) is not clinically relevant in all patients presenting to the emergency department (ED) with acute severe asthma. However, we consider that the 3.9-fold greater risk of patients developing an increase in transcutaneous partial pressure of carbon dioxide ($\text{PtCO}_2$) $\geq 8 \text{ mm Hg}$ (22% vs 6% in the high concentration vs titrated oxygen groups, respectively) is likely to be of clinical relevance in life-threatening asthma. Even in our study, which excluded patients who were unable to speak or perform spirometry due to breathlessness, all 10 patients who had a final $\text{PtCO}_2 \geq 45 \text{ mm Hg}$ had received high concentration oxygen therapy. These findings suggest that the routine administration of high concentration oxygen therapy in the ED setting is a determinant of respiratory failure, a recognised marker of near fatal asthma.

This probably also applies to the routine use of high concentration oxygen therapy during ambulance transfer in patients with severe asthma, as has been noted in chronic obstructive pulmonary disease, but this was not assessed in our study.

While permissive hypercapnia is an approach to the management of mechanical ventilation for severe asthma, this relates to intubated patients, in whom the purpose is to reduce the risk of complications associated with hyperinflation. It certainly does not apply to prehospital or ED care.

We agree that there are many potential risks associated with hyperoxia, including but not limited to reductions in coronary and cerebral blood flow, decreased cardiac output, increased oxidative stress, delay in recognising a clinical deterioration and rebound hypoxaemia if oxygen therapy is abruptly stopped. However, in respiratory disorders such as severe asthma where there is significant ventilation/perfusion (V/Q) mismatch, hypercapnia represents another potential risk of high concentration oxygen therapy that needs to be recognised in clinical practice.

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