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Mini Review

Ventilation and Oxygenation Management in the Traumatic Brain Injury Setting

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Introduction

Early management of ventilation and oxygenation in the patients with traumatic brain injury, can be of importance to reduce secondary injury risks and improve outcomes. Increasing in the intracranial pressure of the patients with traumatic brain injury is an important risk which these patients are faced with. Hypocapnia due to hyperventilation and vasoconstriction in the brain's blood vessels as the result, causes reduction in blood flow. Therefore, the risk of secondary injury due to hypoperfusion and ischemia would increase. It is recommended to keep $PaCO_2$ levels in the range between 35 and 40 in these settings. Minimizing the bag-ventilating of the patients with traumatic brain injury who have been intubated, is an important note which should be kept in mind to reduce the risk of hyperventilation in such patients. These patients should be placed on the mechanical ventilator at the earliest possibility. 7 to 8 liters/min can be a reasonable starting minute ventilation in these settings, because of the possibility of presenting hypermetabolic state in the patients with traumatic brain injury [1-5].

Permissive hypercapnia is inappropriate in these settings since these patients are at risk for Acute Respiratory Distress Syndrome. In such settings Capnography and ABG should be considered to correlate End-tidal CO_2 with the Partial pressure of carbon dioxide. Normoxia is important in such settings to prevent secondary injury and improve the outcomes. The ABG should be checked in a time period about 15 to 20 minutes after intubation. Based on oxygen-haemoglobin dissociation curve in different cases, FiO_2, PaO_2 and O_2 saturation ranges should be defined. Hemodynamic of the patients with traumatic brain injury should be managed appropriately. Hypotension and hypertension in these patients should be corrected to avoid further complications. It is important for the neurointensive care professionals to have knowledge about appropriate management of ventilation and oxygenation in the patients with traumatic brain injury.

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