Anxiety Related Hyperventilation and Consequent Apnea
Pragati Rohatgi, M.D., Thomas J Golembeski, M.D.
Department of Anesthesiology, Yale School of Medicine, New Haven, CT

Case Report

• 17 yo male with hx of photophobia & bilateral optic nerve central pallor planned for MRI brain and orbits.
• Getting MRI without sedation or anesthesia.
• 20 minutes into the procedure, the patient became extremely anxious and requested to be taken out of the scanner.
• He was alert with HR of 125, SpO2 of 100% and a RR of 30.
• Perioral tingling and bilateral carpal spasms noted.
• Decision to continue the scan under general anesthesia.
• MRI compatible monitors placed and oxygen by nasal canula started.
• After administration of 150 mg IV propofol, the patient was talking and disinhibited, and an additional 50 mg was administered. The patient became unresponsive and apneic with stable HR, BP and SpO2 >99%.
• MRI was restarted. Patient remained apneic for approximately 20 minutes.
• One episode of drop in SpO2 to 92% which responded to bag mask ventilation.
• Respiration, hemodynamics and SpO2 remained stable post procedure and was discharged home.

Hyperventilation- ?Anxiety related
• Associated hypocalcemia symptoms
  >Medical emergency
  >Complications- tetany, seizures, arrhythmia, laryngeal spasm
  >Treatment with IV Calcium
• Cause of prolonged apnea
  >Post hyperventilation apnea
  >Use of Propofol
• Post hyperventilation apnea- Hypoxia and cyanosis have been described during apneic periods and can be the cause of mortality. [2]
• Reduced delivery of oxygen to vital organs due to hypocapnia-induced vasoconstriction (Figure 1).

Hemoglobin’s oxygen binding affinity is inversely related to PaCO2- Bohr effect (Figure 2).
• Hyperventilation syndrome might be encountered by anesthesiologists before induction of anesthesia. [3]

Background

• Hyperventilation can occur with anxiety and stress. [1]
• Hyperventilation causes hypocapnia and respiratory alkalosis.
• Alkalosis promotes calcium binding to albumin and hence decreased ionized fraction.
• Hypocalcemia causes overexcitability of neurons.
• Inhibitory effect of alkalosis on respiratory center responsible for post hyperventilation apnea.

Discussion

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Figure 1: Hypocapnia causes vasoconstriction and decreased cerebral blood flow.

Figure 2: Bohr Effect

References