



Shared Learning

from the Dental Patient Safety Foundation Reporting Tool

P0198

“What gets measured gets managed” is the DPSF philosophy to encourage reporting. All received information about patient safety events (unsafe conditions, near misses or adverse events) are de-identified contextually (confidentiality is fully protected under federal law), aggregated, analyzed and abstracted by selected experts from our DPSF committees. Reports are generated and disseminated as the only means to learn from our errors. The information in these peer-reviewed reports is provided for its educational value only, and does not purport to establish any legally binding standard of care. Feedback is encouraged.

Case 2024.3A: Wheezing is always a serious sign during sedation

Situation: A pre-cooperative 6 y/o Lithuanian male presented to a pediatric dentist for multiple dental restorations with IV sedation. Past medical history was obtained from his parent, who spoke some English as a second language. A standard written health history questionnaire was completed by the parent indicating that the child had no ongoing health issues. A follow-up brief verbal interview revealed that the child “felt fine”, had not been receiving medical care and was NPO 8 hours for solids and 2 hours for clear liquids. Lung fields were not auscultated. With the parent in the room, 50:50 mixture N₂O/O₂ was administered via nasal hood and intravenous access was established with a 22g angiocath. 1 mg midazolam was carefully titrated, appropriate monitors placed and a propofol infusion was initiated while maintaining some level of responsiveness to verbal prompts. Local anesthesia was administered and the case proceeded. 15 minutes later, the SpO₂ started to drop from 99% to 93%. The airway was found to be unobstructed, but “slight” wheezing was noted on auscultation of the anterior chest through thick clothing. With only 5-10 minutes left to case completion, the dentist decided to administer 2 puffs of albuterol into the oral cavity and completed the restorations. The SpO₂ dropped to 87%, the propofol infusion and N₂O was stopped, and paramedics were called. The paramedics administered 0.15mg epinephrine IM in the vastus lateralis, and assisted ventilation with a full-face mask. A decision was made to transport the child, who was admitted to the hospital for further evaluation and management.

What we learned:

1. This was a close call. The patient had an unexpected reaction during sedation. Wheezing is a serious respiratory sign, especially in a presumably healthy child. In 20/20 hindsight, the case should have been interrupted so that full attention could have been devoted to the etiology and management of wheezing.
2. Inherent limitations of what can be accomplished in a dental office should be understood and appreciated. This case was 100% elective.
3. English was a second language for this family and the parent might have missed the nuances and importance of the questions. Vague questions such as “is your child healthy” or “how does your child feel” can be improved by specific, detailed inquiry: “has your child had a cough, fever or runny in the past 2 weeks?” And “how is your child feeling, TODAY?”
4. There are limitations to pulse oximetry, which loses sensitivity to detect ventilatory compromise when supplemental oxygen is administered. Even a 1% drop in SpO₂, should warrant immediate and full investigation.
5. There are limitations to side stream capnography, especially when sampling under a nasal hood. Room air entrainment, and dilution by the nitrous/oxygen gas mixture limits the sensitivity of this monitor beyond simple respiratory rate evaluation. In this scenario, it cannot be relied on detect hypoventilation or hypercarbia.
6. Continuous pre-tracheal auscultation, which was not used in this case, would have alerted the proceduralist to new onset wheezing in a timelier manner.

Summary:

On subsequent investigation, it was discovered that both parents smoked cigarettes in the house, and that the child exhibited a chronic cough. They could not afford to access any medical care. In a 6 y/o child, differential diagnosis of new onset wheezing should include at a minimum: bronchospasm, allergy and foreign body aspiration (mucous, blood, water, particulate matter,) all of which would mandate interruption of the procedure. Attempting to use an inhaler in a sedated patient can be difficult. Inline cannister connectors are available that accommodate current cannister designs to maximize drug delivery in conjunction with positive pressure ventilation via a full face mask. This connector should be verified to be immediately available prior to starting the case.



The DPSF encourages frequent reporting of unsafe conditions, near misses and adverse events as the only means to close the gap between knowing how to prevent these occurrences and taking the necessary action to do so. Please visit our website.

Additional Reading:

Bosack, RC. Historical Selection Commentary. Respiratory monitoring for anesthesia and sedation. Anesth Prog 70: 202-205, 2024.