CAPNOGRAPHY FOR MONITORING OF PHYSICIAN-LED PROCEDURAL SEDATION PROCEDURES AT GASTROINTESTINAL SERVICES

Gareth Corbett1, Peter Pugh1, Jurgen Herre1, Teik Choon See1, David de Monteverde-Robb1, Rafael Torrejon Torres2, Rhodri Saunders3, Catherine Leonard4, Amit Prakash5

INTRODUCTION

- Physician-led sedation is commonly used during endoscopic procedures.
- There is still an open question around the optimal patient monitoring strategy during such procedures.
- Use of additional capnography has been shown to be associated with fewer patient respiratory compromise events than pulse oximetry alone.1,2
- To quantify and explore the impact of capnography on patient safety, a quality improvement initiative was undertaken for gastrointestinal (GI), interventional cardiology (IC), vascular access (VA), and respiratory medicine (RM) clinical services at a large UK teaching hospital.

METHODS

- The quality improvement design was pre- and post-implementation of capnography monitoring.
- Events as defined by the World Society for Intravenous Anaesthesia (SIVA) tool, are shown in Table 1.
- A composite endpoint consisting of four target adverse events was defined prospectively.
- The four target events were:
  - Oxygen desaturation (75-90% for <60s)
  - Severe (<75% at any time) or prolonged (<90% for >60s) oxygen desaturation
  - Bradycardia (>25% decrease from baseline)
  - Tachycardia (>25% increase from baseline)
- A 20% reduction in this cumulative endpoint was agreed upon to be the quality improvement threshold.
- Data on procedures featuring procedural sedation were collected as a convenience sample between December 2017 and January 2020.
- The results were entered on-site in an Excel based data collection tool.
- No patient identifiers were recorded.

RESULTS

- The data from 1,401 procedures across the GI, IC, and RM services were collected.
- The first 666 procedures were pre-capnography (baseline), with the subsequent 735 post-capnography implementation (capnography).
- GI represented 601 of the procedures, with 262 collected at baseline and 339 with capnography.
- Over the 1,401 procedures, a 42.1% reduction (p ≤ 0.05) in the incidence of the composite endpoint was recorded. (Figure 1)
- For the department of GI, 20 events were observed in the baseline procedures (0.076 events per procedure) and for the capnography arm 12 (0.035 events per procedure).
- Odds ratios were decreased for all American Society of Anesthesiologists (ASA) levels, with ASA III patients receiving capnography being associated with the lowest odds ratio [0.24 (95% CI: 0.06-0.94)] for the composite primary outcome compared to baseline.
- This represents a 53.9% reduction (p ≤ 0.05) in the composite endpoint.

CONCLUSIONS

- Implementing capnography monitoring led to a 42% overall and a 53.9% GI-specific reduction in the composite outcome patient safety events.
- Participating clinical (GI, IC, RM) services support capnography monitoring being added to the hospital’s sedation guidelines.
- More data are required to explore whether reduction in more rare but severe patient outcomes can be realised with use of capnography monitoring.

Minor risk descriptors
- Oxygen desaturation (75-90% for <60s)
- Bradycardia
- Tachycardia
- Apnoea, not prolonged
- Airway obstruction

Sentinel risk descriptors
- Oxygen desaturation, severe (<75% at any time or prolonged <90% for >60s)
- Apnoea, prolonged (>60s)
- Cardiovascular collapse/shock
- Cardiac arrest/absent pulse

Table 1 Standardised adverse events for procedural sedation according to the World SIVA International Sedation Task Force.3 Adverse events in the cumulative endpoint are highlighted in bold and blue.

Figure 1 Composite endpoint incidence rates during baseline practice and with capnography

References

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