OP-37
Utilisation of Sidestream Capnography in Sedated Patients in the Emergency Department

Teri Millane[1,2], Joe-Anthony Rotella[1], Yit Leang[1], Shaun Greene[1]
1 Victorian Poisons Information Centre and Austin Toxicology Service. Melbourne, Victoria; 2 Gold Coast University Hospital, Gold Coast, Queensland, Australia

Objective: Sedated Emergency Department (ED) patients at risk of hypoventilation and airway obstruction require close monitoring with a 1:1 nurse: patient ratio. Non-invasive real-time monitoring of exhaled (end-tidal) carbon dioxide concentration (capnography) may be non-inferior to standard ventilatory monitoring (direct observation combined with pulse oximetry). Capnography has become standard of care for monitoring patients undergoing Conscious Procedural Sedation (CPS). We aimed to determine whether capnography can provide continuous $ETCO_2$ monitoring in patients sedated secondary to drug overdose (OD), and whether changes in $ETCO_2$ consistently predict hypoxic events, potentially enabling early intervention to prevent serious adverse events.

Methods: Prospective observational study. Eligible patients: reduced Glasgow Coma Score (<13) following sedative drug poisoning or drug administration for CPS. Excluded patients: age <18 years, intubated, sedated solely by ethanol/head injury. Patients undergoing standard ventilatory monitoring were monitored by a study investigator utilising continuous capnography for a one-hour period, with adverse events recorded using a standardized reporting tool. Data collected: demographics, sedative agent, oxygen administration, physiological parameters at baseline and during sedation, loss of capnography signal, major and minor adverse events including apnoea, hypoxia, hypercapnia, airway intervention. The CPS group were compared with sedated overdose patients.

Results: Fifty-three patients were recruited (24 CPS, 29 OD), 59% were male and average age was 48 years (range 19-86). OD patients had lower baseline systolic BP (110 vs. 130 mmHg, P<0.001), and higher $ETCO_2$ (36.3 vs. 31.9 mmHg, P=0.007). Capnography provided a continuous trace in 100% of CPS patients and 93.1% (n=27/ 29) of OD patients (capnography was maintained for >98% of total monitoring period in the two OD patients who did not maintain a continuous trace). There were 15 episodes (CPS n=5, OD n=10) of minor hypoxia (SpO2 75-90%, <30 seconds), detected by a preceding change in capnography in 80% of cases (n=12). There were 34 capnography-detected patient apnoeas; 79% were not followed by hypoxia (n=27). In 59% (n=20) of apnoeas airway intervention was undertaken. In 7 episodes of apnoea that resulted in minor hypoxia, 4 required airway intervention and 3 resolved without intervention. No major adverse events occurred in any patient.

Conclusion: Capnography is able to provide a continuous real-time $ETCO_2$ measurement in sedated ED patients. Capnography is useful in detection of hypoventilation and apnoea, potentially allowing early intervention to limit further adverse events. Studies in larger patient populations are needed to determine if capnography enables sedated ED patients to be safely monitored with less intensive nursing resources.