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Making sense of propofol sedation for endoscopy

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Making sense of propofol sedation for endoscopy

Gastrointestinal endoscopy is one of the commonest hospital investigations and historically was associated with significant morbidity and mortality.[1] The shortfalls in patient selection, sedation and monitoring identified by Quine and subsequent studies precipitated sustained interest in standards and training leading to the development of guidelines. Contemporary practice is dominated by midazolam-opioid combinations used by non-anaesthetists and propofol with or without opioid or midazolam given by anaesthetists. [2] Non-anaesthetist propofol administration is constrained by regulatory considerations, guidelines and intense pressure from anaesthetists. Importantly, sedation practice is non-stationary with improvements in training, new equipment (processed EEG monitoring and capnography) and a developing literature describing emerging patterns of practice against a background of extreme cost pressure. Systematic audit of sedation practice and its outcomes is therefore essential as we refine our clinical teams and their pharmacological approaches.

Leslie and colleagues[3] documented 2,132 adult patients undergoing anaesthetist-managed sedation at a group of hospitals in and around Melbourne, Australia. Their investigation comprises a well-structured prospective audit of events and outcomes in a patient population relevant to many international situations. Using intensive recruitment from multiple hospitals across a short period a large cohort was swiftly recruited in just 28 days, a principle also demonstrated in an earlier snapshot sedation audit by anaesthesia trainees during a two-day period in six UK hospitals.[2]

These procedures took place in well-appointed modern hospitals associated with a tertiary teaching centre. In addition to essential monitoring of arterial blood pressure, oxygen saturation and in most cases (64%) ECG, capnography was widely used (63.8%). Use of depth anaesthesia monitoring was minimal (0 .6%).

Hypotension was common, with “significant hypotension” (systolic blood pressure <90 mm Hg and requiring intravenous fluid bolus or vasopressor) in 10.8% of elective cases and 16.4% of emergencies. Significant bradycardia (heart rate <55 beats per minute and requiring a chronotropic agent) was less common (1.4 and 2.5% respectively).

The study recruited only patients sedated by anaesthetists or supervised anaesthesia trainees and therefore, in some of the recruiting hospitals, a proportion of fitter patients who were triaged to (non-anaesthetist) operator sedation were excluded. This would affect the study population by reducing the number of fitter patients as a proportion of the total thereby exaggerating the fraction of less fit patients within the total requirement for sedation across the recruiting hospitals.

What can we learn? Patients undergoing gastrointestinal endoscopy who received propofol sedation by anaesthetists experience a considerable number of adverse events, especially hypotension and some of them go on to die (overall mortality 1.2% at 30 days, 12.6% amongst those in ASA categories 4 and 5). Lower risk patients (ASA 1-2) fare better.

Does the study tell us anything about the value of anaesthetists as sedationists? Since the investigation limited itself to sedation by anaesthetists there is no built-in control group of equivalent patients sedated by other professional groups.

We can however look to the literature. In a large series of to 24,441 ASA 1-3 endoscopy patients[4] sedated by endoscopist-directed nurses using propofol, the mean propofol doses for colonoscopy and gastroscopy were 150mg and 123mg respectively and lower than the median dose of 200mg given by Melbourne anaesthetists.[3] In the same German series the patients co-administered midazolam received only 86mg or 82mg respectively for colonoscopy and gastroscopy respectively. This begs the question of why German nurse-sedationists use less propofol than Australian anaesthetists. If there is a cultural difference, is it because anaesthetists prefer to give more drug than nurses or is it something between Australia and Germany? Maybe Australian endoscopists want their patients to be "deeper"? A large series of 27,989 patients receiving endoscopist-directed nurse-administered propofol sedation (EDNAPS) from another Australian centre reported a range of propofol doses (10-420mg) but did not report median/mean.[5]

Recently, safe and effective nurse-administered deep sedation for advanced gastroenterological endoscopic procedures such as retrograde cholangiopancreatography and ultrasound has been reported with a mean propofol dose of 397mg used in 1899 patients over a five-year period.[6]

We are left to reflect that sedation practice for endoscopy and access to propofol by non-anaesthetists is heterogenous[7] and probably not evidence-based. It is certainly intensely political.[8] UK guidance on sedation painstakingly avoids linking drugs to professional groupings preferring instead to recommend a competency-based approach.[9] Earlier European guidance took a similar approach[10] but was nevertheless rejected. [8]

What next? Leslie and colleagues recognise that their anaesthetists used generous propofol doses which are in turn associated with more hypotension (even if it is easily treated). Sensibly they acknowledge that the safety implications of this “high-dose” propofol regimen are unclear. Two hypotheses emerge which are suitable for prospective testing in clinical trials. Firstly, the possibility that “high-dose” propofol sedation and its consequent induced hypotension might increase morbidity and possibly mortality. This can be tested by a randomised controlled trial of two different anaesthetist delivered propofol administration schemes (with by implication, two different depths of sedation) with additional endpoints for patient and operator satisfaction. Secondly, we can explore whether anaesthetist and non-anaesthetist propofol sedation may be equally safe, either in low-risk (ASA 1-2) or high-risk (ASA 3-5 and more complex procedures). This could be tested by a randomised controlled trial of nurse versus anaesthetist sedation using a standardised (presumably low-dose) propofol sedation scheme. A non-inferiority design with an appropriate effect size[11] might be appropriate. Whether investigators can be found to push such studies past the politics and entrenched attitudes is another matter altogether…

Finally, Leslie and colleagues remind us that propofol sedation, even when practised by well-equipped anaesthetists is not without risk.[3]

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