“Wake me up before you go-go”. Drug, ‘wham’, scope, then snooze. Can’t we do better with conscious sedation for endoscopy?

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The words of British singer George Michael, in the title of the present editorial, might make some of us think back to our halcyon days when we were young, or at least younger; however, I very much doubt he was highlighting the issues surrounding conscious sedation for endoscopy, although I have not actually asked him about this. Nevertheless, the song title perfectly encapsulates a fairly common situation in endoscopy units where patients are either ‘oversedated’, with a significant recovery period, or do not even feel the ‘sedative’ benefits properly until the procedure is actually completed. I am sure endoscopists are all familiar with the situation in which a patient is somewhat combative during an endoscopic procedure but sleeps like a baby for what seems like ages after the procedure has been completed. Despite undoubted advances in this whole sphere, it is glaringly obvious that there is significant room for improvement in how patients are sedated.

Gastrointestinal (GI) endoscopy is generally performed under conscious sedation. The most common practice, certainly in North America and much of Europe, is to use intravenous doses of benzodiazepines, usually midazolam, and opiates such as meperidine (Demerol, sanofi-aventis Canada Inc) or fentanyl with the level of sedation depending to some degree on the type of procedure and the patient. Diazepam is also used quite commonly, either alone or in conjunction with midazolam.

Although we generally think of these agents as ‘safe’, morbidity rates of one in 200 to one in 2000, and occasional mortality, usually due to cardiorespiratory complications, have been reported. To address these concerns, organizations such as the American Society of Anesthesiologists and the American Society for Gastrointestinal Endoscopy devised more formal practice guidelines for conscious sedation that included the use of supplemental oxygen and revised dosing guidelines recommending titration of sedative medications rather than bolus doses. The issue of bolus versus titrated sedation would need to be addressed in its own article to do it justice, but it is my impression that most of my colleagues in units across Canada and the United Kingdom use bolus sedation. Having previously worked in the Duke Medical Center in the United States, I shudder at the thought of returning to

nurse-directed titration. I recall many instances in Duke where it could take up to 30 min for the patient to be deemed ‘ready’ for endoscopy, particularly for procedures such as endoscopic retrograde cholangiopancreatography (ERCP) and endoscopic ultrasonography. Clearly, this would have a huge negative impact on our already suboptimal situation where we are trying to meet an ever increasing demand for endoscopy. It is debatable if titration improves safety or patient satisfaction.

Assuming we are stuck with bolus administration, how are we doing with standard sedation using midazolam and fentanyl? My own routine practice is to use 2 mg to 3 mg of midazolam along with 50 µg to 100 µg of fentanyl for colonoscopy, to which I often add 5 mg to 10 mg of diazepam for ERCP. If I do actually sedate patients for upper GI endoscopy, I use 1 mg to 3 mg of midazolam on average. Many of our patients do well with such drug regimens, but we do see a

number of patients for whom endoscopy was not a comfortable experience, and we struggle with the amount of time it takes to safely recover the patient before he or she leaves our unit.

OTHER AVAILABLE OPTIONS

Droperidol

Droperidol, a butyrophenone neuroleptic tranquilizer, has previously been used in combination with narcotics and benzodiazepines in conscious sedation for complex endoscopic procedures, and was certainly highly regarded by my endoscopic ultrasonography and ERCP colleagues in the United States (1). However, the debate regarding its use is somewhat academic since its removal from the European market in March 2001, and its black box warning from the Food and Drug Administration due to an association with QT prolongation and torsades de pointes in at least 20 patients (2).

Propofol

A month barely goes by without some study supporting the use of propofol by nonanesthesiologists for conscious sedation. Propofol is an intravenous anesthetic agent often used with

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other agents for delivery of general anesthesia but can be used in lower doses to induce conscious sedation. The use of propofol for endoscopy is very well discussed in the present issue of *The Canadian Journal of Gastroenterology* (3). However, there was some reluctance from the authors to accept the growing body of literature that this drug can be safely administered for conscious sedation by appropriately trained nurses, without the need for anesthesiologists or certified registered nurse anesthetists.

Propofol has some undoubted advantages over benzodiazepines and opiates (4). It has a very short half-life (between 2 min and 4 min) so there is a much shorter time to recovery from the drug than with midazolam, which has a 30 min half-life. Studies suggest that recovery from propofol is 75% quicker than from midazolam. In studies by Vargo et al (5,6), all patients who received propofol were fit for discharge within 30 min of the procedure, compared with less than 20% of patients in the standard sedation group. In addition, patient and endoscopist satisfaction was greater with propofol. The onset time is also very quick, with a rapid induction of sedation compared with traditional agents. This is reflected at a slightly later period as well; 24 h after the procedure the patient has much less difficulty with neurological function, and social functioning is at a higher level than with traditional agents. Also, postadministration nausea is very rare with the use of propofol.

Rapid induction of sedation and subsequent patient recovery would accelerate patient turnover, allowing more procedures to be performed per session. Would this be achieved at the expense of safety? It would appear not. In all the studies (7,8) that have examined administration of propofol for endoscopy by nonanesthesiologists, whether by nurses or nonanesthesiology physicians, over 80,000 procedures have been monitored and none have required intubation (over 35,000 of these procedures had nurses delivering propofol). There have been no procedure-related deaths. There has even been some suggestion, although no specific head-to-head data exist, that propofol may be safer than traditional benzodiazepines and narcotics in these settings.

The concern is that nurses do not have the appropriate training for what is called, among anesthesiologists, monitored anesthesia care for deep sedation. Most professional organizations for anesthesiology do not support the use of this drug by any nonanesthesiologist, whether it be a physician, such as a gastroenterologist, or a nurse, largely because they do not have specific skills in endotracheal intubation. In fact, the product insert itself states that:

"For general anesthesia or monitored anesthesia care or sedation propofol injectable emulsion should be administered only by persons trained in the administration of general anesthesia and not involved in the conduct of the surgical/diagnostic procedure."

I think there were legitimate concerns about the safety of propofol for conscious sedation with nonanesthesiologists, and I suspect some of the ongoing concerns may relate to the fact that there are no strict guidelines in place regarding the appropriate training of a nurse and/or a physician, who is not an anesthesiologist, to administer it. However, some of the resistance is undoubtedly a turf battle, and there is no doubt

that we, as GI endoscopists, should push this agenda with our anesthesiology colleagues and question the resistance to relaxing the rules governing who may or may not administer propofol. I am in complete agreement with the conclusions of Rex et al (7) that nurse-administered propofol sedation is a potential solution to the high cost associated with anesthesia-delivered sedation, and that trained nurses and endoscopists can administer propofol safely for endoscopic procedures. We need to think of patient safety as our first consideration. If this can be unequivocally shown for nonanesthesiologist-administered propofol, as I strongly suspect it can, then we have to realize that this is an avenue worth exploring. The demand for endoscopy is getting greater by the day, especially with the advent of average-risk screening colonoscopy in Canada. I think it is pretty self-evident that using propofol appropriately will allow more patients to undergo endoscopic procedures with shorter recovery times. We truly could be toasting this 'milk of amnesia' in our units in years to come, or at least something very similar, as new, safe, ultra short-acting anesthetic agents are being developed which are likely to supersede propofol in the near future.

For now, we are stuck with benzodiazepines and opiates. The issue surrounding the use of reversal agents after these drugs is somewhat unclear. Certainly flumazenil and naloxone should be considered when there is a concern about respiratory depression. However, should we be using these reversal drugs routinely to reduce recovery time and improve patient throughput? Unfortunately, the data are very unclear (9), and my own personal practice is not to use these drugs routinely. However, this is undoubtedly an area that warrants further study and debate.

Unsedated endoscopy

Unsedated endoscopy is one other option we have which takes drug safety out of the equation, at least for upper GI endoscopy (10,11). This eliminates drug concerns, reduces recovery room time, and allows patients to leave the endoscopy unit unaccompanied and return to work. I perform over 70% of my upper GI endoscopies unsedated, very much in keeping with my experience training in Europe. There is no doubt that there is much more of an expectation in North America to receive sedation even for routine upper GI endoscopy (12), and this barrier will be hard to break down. However, although I have to spend an extra few minutes with the patient in the office, discussing the various pros and cons, I find that most patients have a satisfactory experience and are grateful to have their day unimpeded immediately after the procedure. Explaining to the patient that it is the topical anesthesia rather than the intravenous sedation that mostly inhibits the gag reflex is also a necessary tool! Ultrathin endoscopes, with diameters less than 6 mm, also make unsedated procedures more acceptable to patients.

CONCLUSION

I suppose we should be able to comfort ourselves to some degree that we are not doing too badly with sedation for endoscopy. However, complacency is unforgivable at a time when the demands on our creaking services are growing at an alarming rate. There is no doubt that we can and must do better. I am sure George Michael would sleep much better in his bed knowing we are trying.

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