CLINICAL PRACTICE

Management of Patients Before, During and After Upper Gastrointestinal Endoscopy

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Introduction

For many people the idea of having a long, thin, flexible telescope inserted down ones upper alimentary tract is not one to be savoured. Common anxieties of a patient leading up to an upper gastrointestinal (GI) endoscopy may include:

(i) Is the procedure painful?
(ii) Can I swallow or breathe?
(iii) Will there be throat discomfort?
(iv) What if I gag or cough?
(v) Will I wake up?

It has been noticed that patients having a repeat endoscopy tends to be more relaxed and often require less sedation. Furthermore, less sedation is required for the novices if their anxieties are allayed by careful explanation of the impending procedure[1]. However this does not mean that sedation is unnecessary.

Topical pharyngeal anaesthesia

A recent review[2] suggested using topical pharyngeal anaesthesia only in patients who prefer to be endoscoped without sedation. Topical anaesthesia was also found to be unnecessary in sedated patients in a subsequent study[3]. However the mean (range) dose of midazolam given to patients in this study was 8 mg (4-10). Using a lower dose of midazolam (mean dose = 5.2 mg ± 0.5 (2SEM)), lignocaine spray was found to improve patient's toleration of upper GI endoscopy, the optimal dose of lignocaine being 100 mg[4].

"To Sedate or Not To Sedate, That is the Question."

The term 'conscious sedation' has been coined[5] to describe the state of sedation imparted upon patients undergoing procedures like endoscopy. The patients are lightly sedated but awake, cooperative on demand, amnesic and free from anxiety or fear. The fact that upper GI endoscopy can be done without sedation[6], does not mean that this is the preferred method. Who best to ask about their preference for sedation but patients who have had previous endoscopy. In such a study[7], most patients chose to be sedated. The proportion wishing to be sedated did not differ significantly between new (81%) and follow-up (75%) patients.

Cultural expectations may also play a part. While in countries like Germany[8] and Japan, patients for outpatient endoscopy might expect not to be given sedation, this is not so for their counterparts in the UK[9] or USA[10].

On the other hand, the advantages of not using sedation are obvious:

(i) lower risk of aspiration
(ii) lower risk of hypoxia from hypoventilation
(iii) no need for recovery space
(iv) no need for nursing time and effort in observing sedated patients
(v) no need for patients to be accompanied
(vi) no need for sick leave
(vii) no need for another clinic appointment

Therefore the ideal solution would be to offer patients the choice as to whether or not they wish to be sedated prior to a routine upper GI endoscopy.

Which sedative agent?

Over the course of time, various agents have been used for sedation during endoscopy. However the main

agents used nowadays are benzodiazepines because of their profound amnesic and anxiolytic properties, their low dose-effect curve and their minimal effects on the cardiovascular system. The 2 most widely used benzodiazepines for sedation in endoscopy are diazepam and midazolam[11,12]. Diazemuls is the emulsified form of diazepam and is less irritant to the veins[13]. Both drugs have equally rapid onset of action but the recovery period is prolonged with diazepam as it has a longer elimination half-life (20 to 70 hours Vs 1.5 to 5 hours) and its metabolites are also active[2]. Midazolam also has a superior amnesic effect to that of diazepam (60 to 96% Vs 7 to 73%)[2,10,14]. The superior nature of midazolam to diazepam was also borne out when patients were asked to assess their experience[14].

The role of opiates

The addition of opiates to benzodiazepines given to patients undergoing endoscopy not only confers analgesia but also improves patient tolerability in that the patient gagged and choked less[15]. Benzodiazepine-opiate combinations produce a greater degree of oxygen desaturation than either agent alone[10,16,17]. Thirteen per cent of British endoscopists routinely use an opiate (55% Pethidine) in addition to a benzodiazepine for upper GI endoscopy[11]. This group of endoscopists reported statistically more adverse events, such as respiratory depression and deaths[11]. It is one author's opinion[2] that for simple upper GI endoscopy, as opposed to ERCP, it is unnecessary to use an opiate as well as a benzodiazepine to sedate the patient.

Caution with sedation

It has been estimated that respiratory depression accounts for at least 50% of endoscopy-related complications and 60% of the deaths[5,12]. 70.8% of endoscopists observed significant hypoventilation[12]. The hypoxia which is well-known to occur during upper GI endoscopy[17-20] and many of the arrhythmias[21-23] produced as a result[16] can be abolished largely by supplemental oxygen[10,20,24,25]. If supplemental oxygen is given, its administration ought to be extended well into the post-endoscopy period as it has been shown that post-gastroscopy oxygen saturation remained significantly lower than baseline even 60 minutes after the procedure[26].

Patients at risk of respiratory depression include the elderly, those with: heart disease, cerebrovascular disease, serious pulmonary disease, renal failure, liver failure and jaundice, acute GI bleed, anaemia, morbid obesity and shock[27]. The British Society of Gastroenterology, Endoscopy committee working party recommended the following precautions[27]: identify 'at risk' patients for preoxygenation and supplemental oxygen, monitor them clinically and also using pulse oximeter, and use minimal sedative dose.

Reversal agents

Until recently one of the disadvantages of using benzodiazepines to sedate patients was the fact that, unlike opiates, they were not blessed with a specific antidote, like naloxone. However flumazenil changed all that. It is a competitive antagonist of benzodiazepines at the receptor level and it specifically blocks their central effects[28]. It works within 60s after an intravenous dose and has a short mean elimination half-life of about 50 minutes[28]. However it takes a longer time to reverse the respiratory depression[27].

Anticholinergics

In a nationwide survey[11], only 23% of British endoscopists use anticholinergics routinely in their premedication. Atropine has theoretical advantages of reducing salivary secretions, inhibiting gastric motility and protection from vagally induced arrhythmias. However these have not been borne out in 2 studies looking at ease and tolerance of procedure[30] and frequency of arrhythmias[31].

Recommendations

Upper GI endoscopy is generally regarded as a very safe procedure, but there are potential pitfalls, particularly when examining 'at risk' patients. Based on the local scenario and resources, I would like to make the following recommendations:

(i) Pre-procedure assessment of all 'at risk' patients
(ii) Close monitoring of 'at risk' patients during and after the procedure, clinically and with pulse oximeter and ECG
(iii) Prophylactic use of supplemental oxygen in all 'at risk' cases[25]

(iv) Endoscopists and their assistants trained in resuscitation techniques

(v) Reversal agents, i.e. naloxone and flumazenil, readily available

(vi) Intravenous access

References

1. Johnson JE, Morrissey JF, Leventhal H. Psychological preparation for an endoscopic examination. Gastrointest Endosc 1973;19 : 180-2.
2. Bell GD. Review article: premedication and intravenous sedation for upper gastrointestinal endoscopy. Aliment Pharmacol Therap 1990;4 : 103-22.
3. Chuah SY, Crowson CP, Dronfield MW. Topical anaesthesia in upper gastrointestinal endoscopy. Br Med J 1991;303 : 695.
4. Jameson JS, Kapadia SA, Polson RJ, *et al.* Is oropharyngeal anaesthesia with topical lignocaine useful in upper gastrointestinal endoscopy? Aliment Pharmacol Ther 1992;6 : 739-44.
5. Fleischer D. Monitoring the patient receiving conscious sedation for gastrointestinal endoscopy: issues and guidelines. Gastrointest Endosc 1989;35 : 262-6.
6. Al-Atrakchi HA. Upper gastrointestinal endoscopy without sedation: a prospective study of 2000 examinations. Gastrointest Endosc 1989;35 : 79-81.
7. Probert CSJ, Jayanthi V, Quinn J, Mayberry JF. Information requirements and sedation preferences of patients undergoing endoscopy of the upper gastrointestinal tract. Endosc 1991; 23 : 218-9.
8. Demling L, Elster K, Koch H, Rosch W. Endoscopy and biopsy of esophagus, stomach and duodenum. Philadelphia: WB Saunders, 1982 : 13.
9. Anonymous. Discomforts of modern endoscopy. (Editorial). Lancet 1980;ii : 1064.
10. Ross WA. Premedication for upper gastrointestinal endoscopy. Gastrointest Endosc 1989;35 : 120-6.
11. Daneshmend TK, Bell GD, Logan RFA. Sedation for upper gastrointestinal endoscopy: results of a nationwide survey. Gut 1991;32 : 12-5.
12. Keeffe EB, O'Connor KW. 1989 American Society of Gastrointestinal Endoscopy survey of endoscopic sedation and monitoring practices. Gastrointest Endosc 1990;36[suppl] : S13-8.
13. Jensen S, Huttel MS, Olesen AS. Venous complications after IV administration of diazemuls (diazepam) and dormicum (midazolam). Br J Anaesth 1981;53 : 1083-5.
14. Bardhan KD, Morris P, Taylor PC, Hinchliffe RFC, Harris PA. Intravenous sedation for upper gastrointestinal endoscopy: diazepam versus midazolam. Br Med J 1984;288 : 1046.
15. Boldy DAR, Lever LR, Unwin PR, Spencer PA, Hoare AM. Sedation for endoscopy: midazolam or diazepam and pethidine? Br J Anaesth 1988;61 : 698-701.
16. Murray A, Kenny GC. Monitoring during sedation and endoscopy. (letter) Br Med J 1988;297 : 1337.
17. Rozen P, Fireman Z, Gilat T. Arterial oxygen tension changes in elderly patients undergoing upper gastrointestinal endoscopy. II. Influence of narcotic premedication and endoscope diameter. Scand J Gastroenterol 1981;16 : 299-303.
18. Whorwell PJ, Smith CL, Foster KJ. Arterial blood gas tensions during upper gastrointestinal endoscopy. Gut 1976;17 : 797-800.
19. Rostykus PS, McDonald GB, Albert RK. Upper intestinal endoscopy induces hypoxemia in patients with obstructive pulmonary disease. Gastroenterology 1980;78 : 488-91.
20. Rimmer KP, Graham K, Whitelaw WA, Field SK. Mechanisms of hypoxemia during panendoscopy. J Clin Gastroenterol 1989; 11 : 17-22.
21. Levy N, Abinader E. Continuous electrocardiographic monitoring with Holter electrocardicorder throughout all stages of gastroscopy. Am J Dig Dis 1977;22 : 1091-6.
22. Lieberman DA, Wuerker CK, Katon RM. Cardiopulmonary risk of esophagogastroduodenoscopy: role of endoscope diameter and systemic sedation. Gastroenterology 1985;88 : 468-72.
23. Mathew PK, Ona FV, Damevski K, Wallace WA. Arrhythmias during upper gastrointestinal endoscopy. Angiology 1979;30 : 834-40.
24. Gold MI. Preoxygenation. Br J Anaesth 1989;62 : 241-2.

25. Bell GD, Brown NS, Morden A, Coady T, Logan RFA. Prevention of hypoxaemia during upper gastrointestinal endoscopy by means of oxygen via nasal cannulae. Lancet 1987;i : 1022-4.

26. Bowling TE, Hadjiminas CL, Polson RJ, Baron JH, Foale RA. Effects of supplemental oxygen on cardiac rhythm during upper gastrointestinal endoscopy: a randomised controlled double blind trial. Gut 1993;34 : 1492-7.

27. Bell GD, McCloy RF, Charlton JE, Campbell D, Dent NA, Gear MWL, Logan RFA, Swan CHJ. Recommendations for standards of sedation and patient monitoring during gastrointestinal endoscopy. Gut 1991;32 : 823-7.

28. ABPI Data Sheet Compendium 1991-92. London: Datapharm : 1235-6.

29. Carter A, Bell GD, Coady T, Lee J, Morden A. Speed of reversal of midazolam-induced respiratory depression by flumazenil – a study in patients undergoing upper G.I. endoscopy. Acta Anaesthesiol Scand (suppl) 1990;92 : 59-64.

30. Cook PJ, Bennett PN, Leonard-Jones JE, Warnes TW. Premedications for endoscopy. A trial of atropine, pentazocine or pethidine as a supplement to diazepam. Scand J Gastroenterol 1978;13 : 33-9.

31. McCloy RM, Chiti CC. EKG changes during fibreoptic upper GI endoscopy and colonoscopy. Gastrointest Endosc 1976;22 : 231.