SEDATION TECHNIQUES

Key points

In 33% of patients who recieved sedation, this was combined with oropharyngeal local anaesthesia.

14% of patients had sedation overdose.

1,579 cases were analysed after exclusion of patients who had a general anaesthetic (GA) or were already on intermittent positive pressure ventilation (IPPV) at the time of their endoscopy. A breakdown of the type of sedation by the category of procedure is presented in Table 19.

Table 19. Type of sedation by type of procedure (GA and IPPV excluded)

	PEG	ERCP	Upper GI	Lower GI	Total	*(%)*
None	15	1	24	15	55	*(4)*
Local anaesthesia (LA)	39	1	62	0	102	*(7)*
Intravenous sedation	349	136	317	30	832	*(60)*
LA and intravenous sedation	198	46	168	0	412	*(29)*
Sub-total	**601**	**184**	**571**	**45**	**1,401**	
Not answered	67	28	81	2	178	*(11)*
Total	**668**	**212**	**652**	**47**	1,579	

4% (55/1,401) of patients received no sedation or analgesia and 7% (102/1,401) received local anaesthesia alone. Of those patients undergoing lower GI therapeutic endoscopy, 33% (15/45) had no sedation or local anaesthesia compared with 4% (24/571) of those undergoing an upper GI procedure. In a study of colonoscopy practice in three NHS regions, sedation was used in 95% of cases[3]. The lesser use of sedation in the present study may reflect the advanced age or poor physical status of the patients.

Sedation and analgesia

79% (1,244/1,579) of patients received some form of intravenous sedation. The drug or drug combinations for these 1,244 are presented in Table 20.

Table 20. Intravenous sedation used during the endoscopy

Sedation and/or analgesia	Total	*(%)*
Intravenous opiod	31	*(2)*
Intravenous benzodiazepine sedation	927	*(75)*
Other intravenous sedation	6	*(<1)*
Benzodiazepine and opiod	247	*(20)*
Other intravenous sedation in combination with benzodiazepine and/or opiod	33	*(3)*
Total	1,244	

The most commonly used benzodiazepine was midazolam, which was used in 82% (1,019/1,244) of cases. The most commonly used opiod was pethidine, which was used in 16% (205/1,244) of cases. The others were propofol (4), ketamine (1) and not specified (37). These may have been cases where sedation was provided by an anaesthetist.

Of those given sedation, in 33% (412/1,244) of cases, the patient received both intravenous sedation and topical oropharyngeal local anaesthesia (Table 19). An audit of two regions in England into diagnostic and therapeutic upper gastrointesinal gastroscopy in 1995 showed that there was an association between combined sedation with oropharyngeal LA and the development of pneumonia after gastroscopy[4].

In that audit there was also regional variation in the use of combined sedation with oropharyngeal LA; it being used in 77% of patients in the North West vs. 41% in East Anglia. In this sample many patients were severely unwell or had swallowing difficulties and so the use of combined sedation with oropharyngeal LA for 33% of patients was thought to be too high. It suggests this is a practice guided by rote, with little consideration of individual circumstance.

Case Study

An elderly patient with a history of myocardial infarction and stroke was admitted following a further stroke. Swallowing difficulties and a GI bleed 12 days after admission prompted a gastroscopy and insertion of PEG. Combined sedation with oropharyngeal local anaesthesia was used during the procedure. Two days later the patient was severely unwell with aspiration pneumonia.

For a patient of this age and comorbidity with obtunded swallowing reflex the use of combined sedation with oropharyngeal LA was probably contraindicated.

Of those who received sedation or LA, 43% (575/1,346) of patients developed respiratory complications after their endoscopy. In many cases, the advisors thought that combined sedation with oropharyngeal LA might have contributed to the development of this problem. They reasoned that in a fit patient with a sensitive gag reflex, the use of combined sedation with oropharyngeal LA greatly facilitates upper GI endoscopy and minimises sedatives, especially if the procedure is uncomfortable or prolonged. However, for those patients who are more than normally sensitive to the effects of sedation, or who have difficulty swallowing, the combined effects of sedation with oropharyngeal LA may increase the risk of aspiration. Further studies are indicated to determine whether combined sedation with oropharyngeal LA is associated with an increased risk of pulmonary aspiration or other morbidity and, if so, which patients are most at risk.

Reversal of sedation was used in 14% (176/1,244) of cases. The use of reversal was almost universally to counteract unanticipated central nervous system depression (i.e. an overdose). There is a practice of routine reversal of sedation[5], however, in only two cases did the clinician say that he or she recognised the frailty of the patient and planned reversal of sedation. In an audit of all upper GI endoscopic procedures, the incidence of specific sedation reversal was 0.5-4.2%[4] . In the present study, the reason so many needed reversal of sedation appeared to be due to poor recognition by the endoscopists of how sensitive those with comorbidity can be to the effects of sedatives and consequently giving patients a 'standard' dose of sedation, most commonly IV midazolam 5mg, which was clearly too much for many.

Case Study

A patient with severe alcoholic liver disease, Childs-Pugh C, and bacterial peritonitis had undergone previous gastroscopies for bleeding. Bleeding continued and an endoscopist, who had received training in sedation, performed what was the patient's second gastroscopy in two days. Sedation comprised IV midazolam 5mg and further IV midazolam 2mg. Pulse oximetry was recorded as 87-91% during the whole of the procedure and flumazenil was used to reverse the effects of midazolam following it.

This dose of sedation, which would have been appropriate in a fit adult, was excessive in this patient. In sick patients, sedation should be given in very small doses with sufficient time to assess the effects between increments.

On case review advisors to NCEPOD provided an opinion on the likelihood that sedation was appropriate, considering the physical status of the patient. There was sufficient clinical information for the advisors to consider sedation inappropriate in 14% (218/1,579) of cases. The reasons given are presented in **Table 21.**

Table 21. Reasons why sedation was judged to be inappropriate (answers may be multiple)

Reason why sedation was inappropriate	Total *n = 185*
Excessive opiod	24
Excessive benzodiazepine	161
Insufficient sedation	1
Other*	28
Total	**214**
No reason stated	33

*These included LA & IV sedation (5), patient unfit for sedation procedure (1) and in 22 cases the reasons were not specified.

The advisors most often commented on excessive sedation in patients with upper GI bleeds, severe liver disease, obtunded consciousness (stroke or dementia) or acute chest infection. One advisor commented in the case of an elderly female, *"My old bug-bear! If she needs flumazenil and her sats are <90% on oxygen you have given too much sedation, even if it isn't very much!!"*