



Sedation Strategies in Bronchoscopy: The Effectiveness of Benzodiazepines in Clinical Practice

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Abstract

Sedation during bronchoscopy is crucial to ensure patient comfort and procedural success. Benzodiazepines, such as midazolam, are commonly used to achieve sedation and anterograde amnesia, reducing anxiety and improving the patient's experience. These drugs, due to their anxiolytic, amnesic, and sedative effects, are frequently employed for moderate sedation during diagnostic procedures. However, the safety profile and effectiveness of benzodiazepines, particularly in comparison with other sedatives like remimazolam, have been the subject of numerous studies.

Recent studies suggest that remimazolam, a newer generation benzodiazepine, offers significant advantages over midazolam, such as faster onset, more controlled duration of action, and better neurological recovery with a lower risk of side effects like respiratory depression. Furthermore, in elderly or high-risk patients, remimazolam appears to be a preferable choice to ensure deep sedation with safer management of the airway.

Despite these advancements, the use of benzodiazepines in bronchoscopy sedation still requires careful assessment of individual patient characteristics and specific clinical needs, to optimize benefits and minimize risks.

Keywords: Sedation; Bronchoscopy

Sedation during bronchoscopy is a cornerstone of modern respiratory medicine, enabling a safe and comfortable experience for patients undergoing diagnostic and therapeutic procedures. The choice of sedative agent plays a critical role in ensuring both patient comfort and procedural success. Traditionally, benzodiazepines such as midazolam have been used for their anxiolytic and amnesic properties, which are essential for reducing patient anxiety and ensuring a smooth procedure. However, as bronchoscopy techniques continue to evolve, there is a growing need to refine sedation strategies to enhance safety and efficacy.

Recent research has highlighted the promising potential of newer sedative agents, specifically remimazolam, in improving sedation protocols for bronchoscopy. A comprehensive review of current evidence suggests that remimazolam offers faster onset and more controlled sedation compared to midazolam, while maintaining a superior safety profile. This includes reduced risk of respiratory depression and quicker recovery times, particularly in elderly or high-risk patients [1,2]. Notably, studies have demonstrated that remimazolam is not only more effective in achieving deep sedation but also has a more predictable pharmacokinetic profile, which can further optimize patient care during bronchoscopy [3,4].

The evolving evidence base suggests that remimazolam could represent a safer and more efficient alternative to traditional benzodiazepines like midazolam, particularly in high-risk populations. Moreover, its ability to provide both rapid onset and a quicker recovery period enhances its appeal in clinical practice, where minimizing sedation-related complications is paramount. A thorough review of remimazolam's role in bronchoscopy sedation further emphasizes its promising potential as a primary sedative agent [5]. Moderate sedation is frequently used in procedures like gastroscopy and colonoscopy, where benzodiazepines are often combined with opioid analgesics, such as meperidine, to provide deeper sedation and manage pain effectively. This approach allows patients to remain awake but relaxed, significantly reducing discomfort during the procedure [6].

For more invasive procedures, deeper sedation may be required. Propofol, a short-acting sedative-hypnotic, is often preferred due to its rapid onset and quick recovery time, which are

essential in maintaining patient safety during complex endoscopic interventions [7]. In addition, the use of local anesthesia, such as lidocaine, can help numb the area being examined, reducing pain without affecting the patient's overall consciousness, especially in patients who may not require systemic sedation [8]. Moreover, neuroleptoanalgesia, a combination of neuroleptics like droperidol and opioids such as fentanyl, is also used to induce sedation and pain relief while maintaining a conscious state, offering another option for managing patient comfort in endoscopic procedures [9]. Each of these sedation strategies has specific advantages, and selecting the most appropriate technique depends on the patient's medical history, the nature of the procedure, and the desired outcomes. Further research is needed to refine sedation protocols, ensuring that they are tailored to the individual needs of patients undergoing endoscopic procedures [10]. As the field continues to move forward, there is an increasing need for further studies comparing long-term outcomes between benzodiazepines and newer agents like remimazolam. These studies will be essential in establishing evidence-based best practices for sedation in bronchoscopy. Moving forward, a more personalized approach to sedation, factoring in patient-specific variables such as age and comorbidities, will be key to optimizing both safety and efficacy.

Bibliography

1. José RJ., *et al.* "Sedation for flexible bronchoscopy: current and emerging evidence". *European Respiratory Journal* 22.128 (2013): 106-116.
2. Zhou Y., *et al.* "Efficacy and safety of remimazolam in bronchoscopic sedation: A meta-analysis". *World Journal of Clinical Cases* 12.6 (2024): 1120-1129.
3. Kim SH., *et al.* "Safety and efficacy of remimazolam compared with midazolam during bronchoscopy: a single-center, randomized controlled study". *Scientific Report* 13 (2023): 20498.
4. Wu Qiuyue MM., *et al.* "Bolus administration of remimazolam was superior to midazolam for deep sedation in elderly patients undergoing diagnostic bronchoscopy: A randomized, double-blind, controlled trial". *Medicine* 103.12 (2024): e37215.
5. Noor N., *et al.* "A comprehensive review of remimazolam for sedation". *Health Psychology Research* 9.1 (2021).

6. "Digestive Endoscopy and Sedation".
7. "Sedation and Analgesia for Endoscopic Examination".
8. "Digestive Endoscopy and Sedation".
9. "Gastroscopy with or without Sedation".
10. "Neuroleptoanalgesia".