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Review Article

# Sedatives in Upper Gastrointestinal Endoscopy: Review Article

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## Abstract

**Background:** Sedation helps patients to tolerate uncomfortable gastrointestinal endoscopy procedures by relieving anxiety and pain. It decreases the risk of physical injury during gastrointestinal endoscopy procedures, also provides the endoscopist a good environment for an optimum examination. In addition, an appropriate level of sedation is necessary for safe procedures including therapeutic endoscopy. The goals of sedation are analgesia, amnesia, immobility during the procedure, ability to complete the procedure and quick patient recovery to pre-procedure level of consciousness. In recent years, the need to a safe and effective sedation has increased in practice. Therefore, new sedatives and analgesic drugs for optimal sedated endoscopy have recently emerged. This article reviews the characteristics of new innovations sedatives and analgesics drug, and describe their clinical use in gastrointestinal endoscopy.

**Conclusions:** Judicious use of sedation can alleviate the sympathetic response (rise in heart rate and systolic blood pressure) to the procedure. Midazolam and propofol are the most commonly used drugs in sedated endoscopy.

**Keywords:** Gastrointestinal endoscopy, Analgesia, Propofol, Ketamine, Midazolam.

## INTRODUCTION

The diagnosis and treatment of gastrointestinal illnesses both heavily rely on endoscopy. In order to increase patient satisfaction and make procedures more comfortable, sedation has been employed in clinical practice **[1].**

Although sedation is frequently utilized for these advantages, it still carries some potential hazards, necessitating strict patient monitoring by medical staff during the surgery. Currently, midazolam and propofol are the most frequently utilized anesthetics for endoscopy **[2].**

Due to its benefits, including quick induction and prompt return to consciousness, propofol is frequently used as an intravenous anesthetic in outpatient procedures and examinations **[3].**

But propofol also has drawbacks because it lacks antagonists and lowers respiratory and cardiovascular parameters **[4].**

An anticonvulsant, muscle relaxant, sedative, and anxiolytic benzodiazepine, midazolam has these qualities. Its fat soluble characteristics enable quick action **[5].**

The fact that it can be delivered via a variety of methods and has a brief half-life is further benefits. Hypoxemia, paradoxical reactions, and a delayed recovery are some of the side effects of midazolam. As a result, there is a requirement for alternatives**[6].**

## Upper GI endoscopy

A process for diagnosing and treating problems of the gastrointestinal system is gastrointestinal endoscopy (GIE). Some types of anesthetic are necessary for this surgery. Procedure-related anesthesia aims to ensure security, efficient pain and anxiety management, and a suitable level of memory loss or diminished awareness. The bulk of GIE treatments are typically carried out under

intravenous sedation and topical anesthetic. In lengthy and extensive procedures like endoscopic retrograde cholangiopancreatography, general anesthesia is used. The best anesthetic drugs for GIE procedures should have enhanced safety profiles, short acting, fast onset, and minimal to no side effects**[7].**

**Sedatives used during upper GI endoscopy**

The diagnosis and treatment of gastrointestinal illnesses both heavily rely on endoscopy. In clinical practice, sedation has been utilized to increase patient comfort and satisfaction during the process. Although sedation is frequently utilized for these advantages, it still carries certain potential hazards, necessitating strict patient monitoring throughout the surgery. Sedatives, hypnotics, general anesthetics, and local anesthetics are the most often prescribed medications for UGI endoscopy **[8].**

**A-Benzodiazepines**

The most widely used drugs for preoperative anxiolysis as a supplement to induction and sedation are benzodiazepines. They are protein-bound and lipid-soluble. The primary factor influencing when and how long an effect lasts following a single intravenous dose is redistribution. Benzodiazepines have a favorable therapeutic index, are strong anxiolytics, and cause anterograde amnesia. As a result, they lower the necessary induction dose through a variety of processes, such as pharmacodynamic interactions with hypnotics. They are used to treat status epilepticus acutely and exhibit anticonvulsant action. Although they often lack analgesic characteristics, benzodiazepines can enhance the effects of both sedatives and analgesics. Compared to other induction drugs, they reduce respiration, the reactions to hypoxia, and carbon dioxide, and their cardiovascular depressing effects are low **[9].**

**1-Midazolam**

Midazolam has a calming effect on the muscles because it interacts with glycine receptors. The activity of the drug on GABA receptors can be used to explain almost all of the pharmacologic effects, including as drowsiness, anxiolysis, anterograde amnesia, and anticonvulsant impact **[10].**

The drug impact can be reversed if desired due to the short half-life. When a short-acting, rapid-onset benzodiazepine is required, clinicians should take this medication into consideration. The drug's tendency to be rapidly metabolized with repeated usage is one of its drawbacks **[11].**

**2-Diazepam**

Midazolam has taken the position of diazepam as a preferred method of procedural sedation. Diazepam has a substantially longer duration of action and is less water soluble than midazolam. When given intramuscularly or intravenously, diazepam can result in thrombophlebitis, extravasation, and severe discomfort. However, it also has active metabolites with very long half-lives, which is essentially why it has a longer duration of action. Additionally, those who use cytochrome P-450 inhibitors, are elderly, or have hepatic impairment will experience a longer duration of activity **[12].**

**B- Ketamine**

The neuroleptic anesthetic ketamine acts on the limbic and thalamocortical N-methyl-D-aspartate (NMDA) receptors. It may be administered intravenously or intramuscularly. Patients with hypotension or hypovolemia benefit with ketamine, whereas those with ischemic heart disease or elevated pulmonary vascular pressure find it less appealing **[13].**

**C-Propofol**

An intravenous hypnotic medication called propofol is used to induce and maintain drowsiness and general anesthesia. Due to its favorable pharmacological effect profile, it has become widely used. It works by potentiating the inhibitory neurotransmitter -aminobutyric acid (GABA) at the GABAA receptor. Cardiopulmonary physiology abnormalities are the principal side effects. Propofol should only be administered by medical professionals skilled in giving general anesthesia because of its small therapeutic window**[14].**

**D-Ketofol: (A Combination of Ketamine and Propofol)**

In varying quantities, ketamine and propofol are combined to form ketofol **[15].** It is frequently used for a number of operations. The optimum anesthetic qualities of ketamine and propofol combination include the following **[13]**

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**Chingtham et al. [16]** reported that the combination of ketofol with the highest propofol and lowest ketamine has the quickest induction time. In comparison to a 1:3 combination, ketofol in a 1:1 and 1:2 combination delivers higher haemodynamic stability and has fewer adverse effects.

**E-Opioids:**

Opioids are frequently utilized in anesthesia and pain management as analgesics. The term "opioid" refers to both natural and synthetic medications that systemically act on opioid receptors. Opiates are directly generated from the opium crop. Individual medication pharmacokinetic, pharmacodynamic, and adverse effect characteristics should be taken into account when selecting an opioid agent for procedural sedation. Rapid onset, analgesic effects, little to no respiratory depression, little to no hemodynamic effects, and a low frequency of negative side effects would all be characteristics of the ideal opioids for use in procedural sedation **[15].**Strong synthetic opioid fentanyl has neither inherent amnestic nor anxiolytic effects. It is the perfect medication for use in gastrointestinal endoscopy (GIE) sedation because of its quick start, brief duration of action, lack of direct cardiac depressive effects, and absence of histamine production. It is simple and quick to titrate intravenous fentanyl for unpleasant treatments. When both medications are carefully titrated, the popular regimen of fentanyl and midazolam has a good safety record. Fentanyl, like all opioids, can lead to respiratory depression, which includes apnea, nausea, and vomiting. Additionally, it may result in bradycardia and stiff skeletal muscles**[18]**

**Medication related complications during upper GI endoscopy**

Even though upper endoscopy is among the safest gastrointestinal procedures, problems are nevertheless possible and should be well treated in advance. Mortality rates in 2000 ranged from 0 to 1, with overall complication rates between 1: 200 to 1: 10,000. These substantial variations can be attributed to variations in study demographics, reporting methods, complications criteria, and follow-up reporting time. Drugs used for sedation, anesthesia, and/or the endoscopic operation itself may have complications associated with CVS (hypertension, arrhythmias, and myocardial ischemia/infarction). And complications associated with the respiratory system (pulmonary aspiration, hypoxia, airway blockage, and respiratory depression**[19].**

## CONCLUSIONS:

Judicious use of sedation can alleviate the sympathetic response (rise in heart rate and systolic blood pressure) to the procedure. Midazolam and propofol are the most commonly used drugs in sedated endoscopy.

**Declaration of interest**

The authors report no conflicts of interest. The authors along are responsible for the content and writing of the paper.

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