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Current View

Endoscopic Sedation: The Anaesthesiologist's Perspective

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Endoscopic procedures, either diagnostic or therapeutic are stressful and sometimes painful to the patient, regardless of the endoscopist's skill and the diameter of the scope used. In recent years, an ongoing number of gastroenterologists are considering conscious sedation to be an integral component of the endoscopic examination, since it reduces patient's anxiety and discomfort and improves patient's tolerance and acceptance of the procedure.[1] Sedation and analgesia also minimize the risk of physical injury during the procedure and provide the endoscopist with an ideal environment for a thorough examination. On the other hand they delay patient's recovery and discharge, increase the cost of the procedure, and increase the risk of cardiopulmonary complications,[2,3] which -although infrequent- are the most common type of complications seen during endoscopy.[4] Despite the fact that gastrointestinal endoscopy is generally consider as a safe procedure, a number of severe complications which occur are sedation-related and, according to the literature, sedation-related mortality is high compared to perioperative mortality due to general anaesthesia.

Sedation has been defined as a drug-induced depression of the central nervous system and, according to the American Society of Anaesthesiologists may range from minimal to general anaesthesia.[5] Sedation practice differs not only between countries but also between hospitals and departments, and each endoscopy unit may have special policies regarding to the use of sedation, the type of sedation as well as the responsibilities of each member of the team. On the other hand, the practice of giving sedatives for gastrointestinal endoscopy is related to the availability of the anesthesiologist, the experience of the endoscopist and the cost, although the administration of sedation by non-anesthesiologists allowed a significant increase in the number of procedures performed under sedation and saved anaesthesiology resources.[6] The achievement of safe and effective sedation for all endoscopic procedures remains of top priority; for this reason many scientific societies have published practice guidelines.[7-10] In Greece, a recent Ministry of Health decision defines the minimum acceptable standards of monitoring for safe anaesthesia administration, while article 4 refers to the minimum requirements for giving sedation in any kind of intervention and in any place, besides the surgical procedures and the operating theatre.[11]

In a recent review, "Sedation in Gastrointestinal Endoscopies (Part I and Part II)", Paspatis et al[12,13] analyse the different techniques and the drugs used in sedation for every endoscopic procedure –both diagnostic and therapeutic- based on their personal experience and that of the literature. Particular reference is made regarding the safety of the patient and his monitoring, while there is a special section on sedation administration in extreme age groups, such as the elderly and children.

The drugs used traditionally for endoscopic sedation are the benzodiazepines and the opioids. They are widely accepted by non-anesthesiologists and administered either alone or in combination. Midazolam is preferred to diazepam, due to its shorter duration, while Meperidine is the most widely used opioid. The reason these drugs are popular is the existence of their pharmacological antagonists, like flumazenil and naloxone for benzodiazepines and opioids respectively. Here we hasten to underline the following: The reversal of benzodiazepines and opioids by

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the use of antidotes is an effective procedure, sometimes proving to be life-saving; however it includes the risk of rebound, as the duration of action of sedatives is greater than that of antidotes. Even fully alert patients after the administration of sedation should not drive, operate machinery or take serious decisions.

Benzodiazepines are used for minimal or moderate depth of sedation and are usually adequate in controlling pain and discomfort; however, it is difficult to achieve deep sedation by these drugs without loss of airway or disturbances in ventilatory drive, while a combination of them exerts synergistic effects providing several important benefits including analgesia and sedation, but increase the risk for cardiorespiratory complications. Propofol is the newest pharmacologic agent for sedation which is constantly gaining acceptance among endoscopists as an effective drug for achieving ideal sedation. It provides faster onset and deeper sedation than benzodiazepines with or without narcotics and rapid cognitive and functional recovery, especially in the case of being given as a single sedative agent. The optimal level of sedation differs from patient to patient but also depends on the type of procedure. For lower digestive endoscopy which is accompanied by pain, the use of opioids is essential unlike the upper, which, although not painful, is uncomfortable and often accompanied by nausea, vomiting and hiccups.

Moderate sedation does not usually affect vital functions and everything is simplified. However, when deep sedation is necessary, as patient's airways are unprotected, (such as those subjected to upper GI endoscopy), special care is required to avoid serious complications, such as hypoxia due to impaired ventilation, either from partial obstruction of airways or due to expected reduced ventilatory drive.[14,15] In morbidly obese patients or those with sleep apnea, airway obstruction must be expected even with small doses of sedatives. Airway obstruction generally precedes the impairment of ventilatory drive manifested as bradypnia or apnea; upon identification, it is usually easily delt with by the use of basic airway maneuvers, and rarely bag – mask ventilation support is needed. Hypoxia caused from such a situation is transient if detected early and treated properly, while persistent hypoxia means failure to be recognized early. Tachycardia and hypertension are the most common haemodynamic side-effects. Tachycardia, although a common finding during upper digestive endoscopy, is a well known important pathogenic factor for the development of myocardial ischemia during the procedure; the administration of β-adrenergic blockade can protect the heart being one of the target organs of endocrine stress. Risk factors for severe cardiovascular complications are pre-existing coronary artery disease or heart failure, unlike complications related to the respiratory system that may occur in healthy patients without coexisting disease.[9]

Patients undergoing endoscopic procedures with moderate or deep sedation must have continuous monitoring before, during, and after sedative administration, the most important element being the close continuous observation of the patient.[9] Pulse oxymetry, although a useful tool for recognizing hypoxemia remains not only fully insufficient in detecting hypoventilation[16] but also contributes to a delay in its recognition in the case of supplementary oxygen is given.[17] Capnography thus remains the most sensitive monitoring apparatus to detect hypoventilation. The sedation area must be ample and comfortable and the emergency drugs should be immediately available, along with material and equipment adequate to support the respiratory and circulatory system or to provide cardiopulmonary resuscitation.

The personnel who provide intravenous sedation should be familiar with the unique pharmacologic properties of all agents used for sedation and reversal during the procedures and be able to recognize early and face up to complications. The knowledge of pharmacological characteristics is necessary, but is inadequate alone for the safe use of these, especially when given in high doses to achieve deep sedation. Thus training of physicians must be undertaken prior to using sedation for GI procedures. Current certification in advanced life support (ALS) and ALS skills such as airway management and intravenous line insertion are necessary, but education alone in airway training manikin is not enough to manage clinical problems related to the airway. Anaesthesia departments are perfect places for training in skills like basic airway maneuver release (chin lift, jaw thrust), providing assisted ventilation (bag valve ventilation, laryngeal mask insertion or endotracheal intubation). Skills like endotracheal intubation should not be preferred by non-anesthesiologists because they need good training and clinical experience to avoid events such as oesophageal intubation, while, on the other hand, may be easily lost if not applied at regular intervals. On the contrary, laryngeal mask airway or other alternative supraglottic airway devices for patient ventilation are practical and effective methods.

Intravenous sedation is standard worldwide accepted practice for endoscopic procedures[18] aiming to maximize patient comfort, to relief pain and to minimize the risk of drug – related side effects. Achieving optimal sedation requires careful consideration of the patient; however it is not always possible to achieve the targeted level of sedation. In every

day clinical practice the line between sedation and apnea is not always clear,[19] every patient is different to the others and thus requires special attention and treatment. Titration drug doses and knowledge are the keys to success.

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