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Propofol Sedation for Patients Undergoing Gastrointestinal Endoscopy Procedures: Challenging Existing Paradigms in Healthcare

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Introduction

Born an anaesthetic, propofol has in recent years re-emerged as its alter ego, a pre-eminent sedative agent. In this capacity, propofol is significantly superior to traditional sedative agents for patients undergoing gastrointestinal endoscopy procedures. A key advantage is that patients recover better after propofol sedation than conventional (benzodiazepine/opioid) sedation [1,2]. It is ironic that noteworthy research in this area has been conducted by gastroenterologists, for they are not licensed to administer propofol to patients. Propofol is considered by many to now be the preferred sedative drug for patients undergoing gastrointestinal endoscopy procedures. The worldwide demand for optimal sedation in patients undergoing endoscopy procedures is vast, and will likely multiply with increasing awareness of the advantages of propofol sedation, and a growing elderly population [3]. However, it must be born in mind that propofol was initially introduced as an anaesthetic agent, and has potent cardio-respiratory depressant properties [4]. Propofol therefore has the potential to cause apnoea, respiratory obstruction and hypotension when administered to patients as a sedative agent. Current U.S. Food and Drug Administration (FDA) regulations state that administration of propofol to patients should only be performed by trained anaesthesia personnel. This limits the availability of propofol sedation to many patients undergoing gastrointestinal endoscopic procedures.

The demand for propofol sedation has created discord between gastroenterologists and anesthesiologists. Gastroenterologists in North America have asserted that they can administer propofol safely to patients undergoing endoscopic procedures, and in the USA have petitioned the FDA to be able to do so [4-6]. However anesthesiologists have opposed their attempts, and the FDA rejected their proposal in 2010. It is not surprising that there are divergent opinions between the specialties in this shared territory of sedation practice. However, it is possible that both sides have valid points to present.

In an endeavor to gain a deeper insight into this conflict, one could reflect on whether the phenomenon of the "Rashamon effect" [7] has any validity here [7]. The "Rashamon effect" is a concept illustrated in the classic Kurosawa film Rashamon. In the film, different people with different backgrounds provide alternative, self-serving and contradictory versions of the same incident. If we were to analyse the propofol sedation question with a medical "Rashamon" lens, could we arrive at a more patient focused solution than that currently available?

The Merits of Propofol Sedation

Propofol sedation is clearly more effective, and associated with better recovery and shorter discharge periods than conventional sedation, in patients undergoing gastrointestinal endoscopy procedures [1,2]. Not only is immediate recovery faster and better, but the recovery profile 24 hours after the procedure is improved following propofol sedation [8]. In addition, it has been argued that propofol sedation is safer than the traditional sedative technique [9]. This is powerful evidence supporting this form of sedation.

Gastroenterology Perspective

Gastroenterologists can rightly claim to be experts in the field of sedation. Historically they have been the main providers of this service to patients undergoing gastrointestinal endoscopy procedures. The traditional sedative technique has been to administer midazolam or benzodiazepine, either on it's own or in combination with an opioid, to target conscious sedation in patients undergoing these procedures. It is of note that deep sedation has been shown to be a frequent result of this technique [10], so gastroenterologists are no strangers to dealing with heavily sedated patients. In more recent years gastroenterologists have been instrumental in demonstrating the superiority of propofol sedation over conventional sedation in patients undergoing gastrointestinal endoscopy procedures [1,2]. Furthermore, Rex and colleagues have presented data from a worldwide safety survey to support the notion that endoscopist directed propofol sedation is safe, and probably safer than conventional sedation [9]. The argument for endoscopist directed propofol sedation is further strengthened if one considers the relatively high cost of anaesthesia administered propofol sedation.

Concerns of Anaesthetists and Anesthesiologists

Anaesthesia specialists have concerns regarding non-anaesthesia personnel administered propofol sedation for several reasons.

Propofol has the potential to cause rapid and profound changes in sedative/anaesthetic depth, it has no specific antidotes and can demonstrate marked synergy with other drugs [11]. Although conscious sedation may be targeted in patients, deep sedation may be necessary for more uncomfortable gastrointestinal procedures, or may result due to variability in patient's sensitivity to propofol. There is therefore a significant risk of respiratory compromise occurring in patients receiving propofol sedation, a complication that requires swift intervention. In addition, the shared and open airway in patients undergoing gastrointestinal endoscopy procedures under sedation poses further potential hazards of regurgitation and aspiration. Although this risk is relatively rare, as patients are routinely fasted prior to the procedures, it is an ever present and sometimes unpredictable occurrence [12], and requires immediate action. Not surprisingly, anaesthesia personnel feel that they are the most suitable medical professionals to deal with the above mentioned complications.

In consideration of the potential hazards of propofol sedation in patients undergoing gastrointestinal endoscopy procedures, some anaesthesia practitioners consider traditional general anaesthesia with tracheal intubation to be a more reliable and safer technique in patients undergoing these procedures [13].

Deep sedation is a level of sedation described in the American Society of Anesthesiologists (ASA) classification of sedative levels [14]. It has been defined as "A drug-induced depression of consciousness during which the patient cannot be easily aroused, but responds purposefully following repeated or painful stimulation, and during which independent ventilatory function may be impaired". This category of sedation has created further misunderstanding in the ongoing debate around propofol sedation. Although the gastroenterology community may be right to point out that deep sedation is not categorised as general anaesthesia by the ASA classification, many anaesthetists/anesthesiologists regard deep sedation as indistinguishable from light general anaesthesia. They are therefore uncomfortable with the idea of non-anaesthesia personnel independently administering propofol to patients.

Do we have enough evidence about the safety profile of propofol sedation? In contrast to the data presented by Rex and colleagues [9], the ASA closed claims database suggests that propofol sedation is not without problems [15]. Metzner analysed remote location claims for injuries in this database, and found propofol (as a sedative agent) to be the commonest drug administered to patients in these instances. The gastrointestinal suite was responsible for 32% of remote location claims, and respiratory depression due to overdose of sedative-hypnotic-analgesic drugs accounted for more than half the claims in the gastrointestinal suite. Finally, the severity of patient injury in remote location claims was far greater than that of operating room claims, with the proportion of death almost double in the remote injury claims [15]. Further data relating to the safety of propofol sedation may well become available with the passage of time.

Conclusion

What conclusion can we draw from these conflicting findings and opinions? It seems that propofol is a novel sedative whose use requires a new paradigm of sedative care. It can often be administered safely to patients by non-anaesthesia personnel, but whenever complications such as respiratory compromise and significant regurgitation occur, immediate assistance by anaesthesia personnel is desirable.

One solution would be to incorporate an anesthesiologist/anaesthetist into the endoscopy team in hospitals. Anaesthesia presence in the endoscopy suite could ensure that patients unsuitable for propofol sedation are identified and undergo their procedure under standard general anaesthesia with tracheal intubation. The remainder of patients could receive propofol sedation for their procedures, administered by appropriately trained non-anaesthesia personnel, and supervised by the anaesthetist/anesthesiologist (provided of course that the relevant licensing bodies are in agreement). As the anaesthesia specialist would be attendant in the gastroenterology suite for the duration of the scheduled endoscopy procedures, immediate assistance would be available in case of mishaps.

Future developments may result in newer drugs and safer techniques becoming available for use in this important and expanding area of medical practice. However, for progress in patient care to be realised, it may also be necessary for physicians across specialties to engage with each other and reassess traditional models of care.

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