

Deeper Sedation by Anesthesia Staff Results in Improved Procedural Outcome and Enhances Patient Safety- A Comparison of ERCP outcomes with conscious sedation and monitored anesthesia care.

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ABSTRACT

Aim: To assess the outcome of ERCP with conscious sedation and monitored anesthesia care and compare the complication rate at various stages of anesthesia.

Place of study: Department of Gastroenterology and Hepatology, Fatima Memorial Hospital Shadman, Lahore.

Study design: Cross Sectional study.

Methods: We collected data on outcomes including cannulation rate, completion of desired treatment and rate of complications in 109 patients

48 (44%) patients undergoing the procedure with conscious sedation using a benzodiazepine and narcotic combination administered by the nursing staff and 61(56%) patients with monitored anesthesia care (MAC) administered by the anesthesia staff.

Results: A total of 109 patients were included in this study. 48/109 (44%) of the patients underwent ERCP under conscious sedation while 61/109 (56%) underwent the same procedure with MAC. Overall success rate of the procedure as defined by completion of the desired treatment was 78% with a 63% completion rate in the conscious sedation group and a 92% completion rate in the MAC group.

Conclusion: MAC results in improved procedural outcomes including success of cannulation and completion of desired treatment when compared to conscious sedation.

Patients undergoing ERCP under MAC also have a much lower complication rate.

Keywords: Deep sedation, Endoscopic retrograde cholangiopancreatography, Monitored Anesthesia Care, Sedatives

INTRODUCTION

Sedation and analgesia are an integral part of endoscopic procedures. They reduce intensity of pain, level of discomfort and stress in patients undergoing unpleasant and prolonged procedures such as endoscopic retrograde cholangiopancreatography (ERCP) and ultimately lead to better tolerance and compliance by the patient.¹ and thereby minimizing the chances of injuries during ERCP due to limited co-operation of the patient and help the interventionist².

According to the American Society of Anesthesiologists (ASA), sedation is defined as a

continuation of progressive impairment in consciousness ranging from minimal to moderate, deep sedation and general anesthesia³. Furthermore, moving from a state of consciousness to deep sedation is a dose-related continuation that actually depends on patients' response and consequently, the state originally intended may not be the one which is achieved⁴⁻⁶.

This variability in response of the drug can be explained by the different pharmacokinetics and pharmacodynamics of sedative drugs, so the standard dose of one sedative drug may result in exaggerated response and in some patients very little response with the same dose of the sedative drug⁴. Minimal sedation can be explained by a state in which patients respond normally to verbal commands. However cognitive function and coordination both are reduced. In this phase the patients' ventilatory efforts and cardiovascular functions are spared.

Monitored anesthesia care (MAC) is new term referred to moderate level of sedation in which the patient can respond to verbal commands or tactile

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stimulation. In MAC, patient undergoes local anesthesia together with sedation. Patients' respiratory efforts and cardiovascular functions are spared and no need to intervene to keep the airway patent. At a deeper sedation level, the patient is only responsive to repeated or painful stimuli. Cardiovascular functions are preserved but can also get compromised. The level of care need to be kept at the same level as of a patient undergoing general anesthesia³.

General anesthesia refers when patients stop responding to painful stimuli and loss of protective airway reflexes. Endoscopic retrograde cholangiopancreatography (ERCP) is a procedure done by a combination of luminal endoscopy and fluoroscopic imaging to diagnose and treat few conditions of pancreatobiliary system.

In 1968 the first report of the cannulation of major papilla endoscopically, ERCP has emerged from a simple diagnostic procedure to become a therapeutic procedure of increasing duration and complexity, where patients' cooperation is much needed⁷.

Duodenal perforation and acute pancreatitis have been observed commonly and are attributed mainly to limited patients' cooperation in shape of restlessness and anxiety shown by the patient.

Therapeutic applications of ERCP has grown up, making the treatment possible of complex pancreatobiliary diseases and thereby minimizing the need for open surgical and percutaneous techniques and now almost all biliary diseases can be dealt with endoscopic treatment which has lead to a perception in many patients to opt for therapeutic ERCP especially those patients who were previously considered not fit for surgery or with life-threatening conditions. So sedation for therapeutic ERCP is not only mandatory but also appropriate, effective and safe for the patients.⁸

The objective of the study was to compare the ERCP outcomes in patients with various levels of anesthesia and compare the rate of complications in patients undergoing ERCP with various levels of anesthesia.

MATERIALS AND METHODS

We collected data on outcomes including cannulation rate, completion of desired treatment and rate of complications in 100 patients- 50 undergoing the procedure with conscious sedation using a benzodiazepine and narcotic combination administered by the nursing staff and 50 with monitored anesthesia care administered by the anesthesia staff. The results were compiled and analyzed.

RESULTS

Total 109 patients were selected for this study. 48/109 (44%) of the patients underwent ERCP under conscious sedation while 61/109 (56%) underwent the same procedure with MAC. The most common indication for ERCP included Choledocholithiasis followed by biliary malignancy and then iatrogenic CBD injury. Overall success rate of the procedure as defined by completion of the desired treatment was 78% with a 63% completion rate in the conscious sedation group and a 92% completion rate in the MAC group. Reasons for incomplete treatment in the conscious sedation group included difficult anatomy in 18, failure to sedate the patient in 3 and unstable patient in 2 cases. On the other hand, all 5 unsuccessful ERCPs in the MAC group was due to challenging anatomy. There were 3 post-procedure related complications in the conscious sedation group while no periprocedural complication occurred in the MAC group.

Table 1: Type of Anesthesia

	Frequency
Conscious	48 (44%)
Monitored	61 (66%)
Total	109 (100%)

Table 2: Post Procedure Complication:

Complication	
Yes	3(2.8%)
No	106 (97.2%)
Total	109(100%)

Table 3: Type of Anesthesia and procedure completion

Type of anesthesia	Procedure completion		Total
	Yes	No	
Conscious	29	18	48
Monitored	56	5	61
Total	85	23	109

DISCUSSION

Endoscopic retrograde cholangiopancreatography (ERCP) is an endoscopic procedure that is longer in duration and can only be performed by the experienced interventionist.

A study Conducted by Jeurnink SM, et al⁹ revealed that patients undergoing ERCP under conscious sedation between a third and a half of patients experienced pain and discomfort during the procedure and after the procedure was completed.

A study conducted by Raymondos K, et al¹⁰ revealed that failure rate in patients undergoing ERCP with sedation was double than the failure rate when general anesthesia was utilized (14% vs. 7%). This higher failure rate with conscious sedation

attributed mainly to ERCPs that were terminated prematurely (8.5%) because of inadequate sedation

Findings of the study conducted by Raymondos K, et al¹⁰ strongly support the use of deep propofol sedation or general anesthesia in patients undergoing ERCP which is the usual practice in many Centers as well.

Findings of the study Raymondos K, et al¹⁰ cannot be generalized to whole population as more studies need to be conducted to propose the most appropriate type of sedation or anesthesia for difficult endoscopic procedures like ERCP. Our study results are consistent with the results shown in other studies. The outcomes of ERCP are significantly better as the endoscopist is able to focus on his/ her task without getting distracted by an unstable patient.

A review done by Garewal D, et al¹¹ identified only four randomized controlled studies comparing moderate sedation using midazolam and meperidine with propofol administered by anesthesiologists for ERCP. There was no difference in mortality, cardio-respiratory complications and patients' satisfaction between the two sedation techniques, but patients who received propofol sedation had a faster and better recovery profile.¹¹

Our study revealed very low complication rate in patients undergoing the procedure with MAC. This is again due to a closer and more effective monitoring of the patient by the anesthesia staff while administering optimal level of sedation. The incremental expense is definitely justified by a very high success rate and a very low complication rate.

CONCLUSIONS

MAC results in improved procedural outcomes including success of cannulation and completion of desired treatment when compared to conscious sedation

Patients undergoing ERCP under MAC also have a much lower complication rate.

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