

Impact of sedation use on patient anxiety and satisfaction during colonoscopy

Mehdi Haydari Monfared, Ramin Talaie, Homayon Zojaji, Nahid Dadashzadeh, Faramarz Derakhshan, Mohammad Reza Zali

Research Institute for Gastroenterology and Liver Disease, Shahid Beheshti University, M.C., Tehran, Iran

ABSTRACT

Aim: To evaluate the anxiety level and patient satisfaction during colonoscopy in patients who received intravenous sedation and also to determine the main predictors that may influence the anxiety level related to colonoscopy.

Background: Intravenous sedation may play a major role in reducing patient anxiety during colonoscopy and increasing the patient's satisfaction.

Patients and methods: Seventy patients scheduled for diagnostic colonoscopy were categorized into 2 groups matched for sex, age, and indication of colonoscopy. The patients in the first group were sedated with midazolam 0.1 mg/kg intravenously and the patients in the second group received saline as placebo. The level of satisfaction was evaluated on a 5-point scale (poor, fair, good, very good, and excellent) and the severity of anxiety was rated on a 100 mm visual analogue scale with "not at all anxious" and "extremely anxious" as anchors.

Results: No significant difference was found in the level of post-procedure satisfaction between the sedated and non-sedated groups ($P=0.720$). The mean of anxiety score in sedated patients was significantly lower than another group (47.6 ± 25.9 versus 74.4 ± 16.3 , respectively, $P<0.001$). History of colonoscopy was an important predictor for the increase of anxiety related to colonoscopy ($\beta=15.2$, $SE=7.1$, $P=0.037$).

Conclusion: Sedation can reduce anxiety during colonoscopy, but post-procedure patient's satisfaction is not dependant to sedation use.

Keywords: Anxiety, Colonoscopy, Midazolam, Satisfaction, Sedation.

(Gastroenterology and Hepatology From Bed to Bench 2008;1(2):65-69).

INTRODUCTION

Colonoscopy is a commonly performed and beneficial procedure with a broad range of indications including the evaluation of lower gastrointestinal bleeding, abnormal radiographic findings, and screening and surveillance of colon cancer. It is also being increasingly used therapeutically (1); However, colonoscopy has

associated disadvantages (2). Some studies have addressed the degree of anxiety or discomfort that patients experience during colonoscopy (3-5). According to previous evidence, intravenous sedation plays a major role in reducing patients' pain and anxiety during colonoscopy and increases their satisfaction (1, 6, 7). However, in some others, the degree of anxiety and the level of satisfaction were similar between sedated and non-sedated groups (8-10). Although many studies have been designed to clarify the advantages and disadvantages of conscious sedation and the

Received: 11 December 2007 Accepted: 28 February 2008

Reprint or Correspondence: Mehdi Haydari Monfared, MD. R Research Institute for Gastroenterology and Liver Diseases, Shahid Beheshti University, M.C., Iran

E-mail: article@rcgld.org

associated factors, there are few data describing pre-colonoscopy patient concepts, values, and preferences of sedation during colonoscopy. In addition, knowledge about the procedure can be advantageous to satisfaction outcomes, pre-procedure anxiety and adherence (5).

Therefore, the assessment and comparison of the degree of anxiety and satisfaction in sedated and non-sedated patients and determination of predictors that might influence these outcome measures are necessary. To test the hypothesis that sedative administration can reduce the post-colonoscopy anxiety and discomfort, we prospectively evaluated and compared the anxiety level and patient satisfaction after colonoscopy in patients who had received intravenous sedation and non-sedated patients and also determined the main predictors that may influence the anxiety level in these groups.

PATIENTS and METHODS

This prospective study was performed between October 2005 and August 2006 at the research Institute for gastroenterology and liver disease of Shahid Beheshti University of medical sciences. The study was approved by ethical committee of University and the patients gave written informed consent before participation in the study. Colonoscopy was performed by one experienced endoscopist.

Seventy patients with the mean age of 46.0 ± 14.9 years who were candidates for elective colonoscopy were found eligible for entry into the study. All patients with obstructive disease of the colon or rectum were excluded from the analysis. Patients were also excluded if they were undergoing therapeutic procedures or declined conscious sedation. Hospital inpatients were excluded because they represented a small subset of patients undergoing potentially therapeutic procedures and often experienced significant stress related to comorbid conditions.

Patients were randomly divided into two groups including sedated group (46 patients who were sedated with midazolam 0.1 mg/kg, intravenously for preoperative premedication) and non-sedated group (24 patients who received saline as placebo). These two groups were matched for gender, age, indication of colonoscopy, history of colonoscopy, duration of colonoscopy, and wait time for colonoscopy.

The main outcome measures comprised: 1) the level of satisfaction on a 5-point scale (poor, fair, good, very good, and excellent), and 2) the severity of anxiety which was rated on a 100 mm visual analogue scale (VAS) with "not at all anxious" and "extremely anxious" as anchors (7). Outcome information was recorded 30 minutes after the completion of the procedure.

Results were reported as mean \pm standard deviation (SD) for the quantitative variables and percentages for the categorical variables. The groups were compared using the Student's t-test or Mann-Whitney U test for the continuous variables and the chi-square test (or Fisher's exact test if required) for the categorical variables. Individual factors were first considered in a simple linear regression analysis to estimate the strength of association between these factors and post-procedure anxiety. In the subsequent analysis, all factors were simultaneously considered in a multiple linear regression analysis using the backward elimination algorithms, to screen for independent significant factors. P-values of 0.05 or less were considered statistically significant. All the statistical analyses were performed using SPSS version 13 (SPSS Inc., Chicago, IL, USA).

RESULTS

Data regarding the personal and clinical characteristics of participants are presented in Table 1.

Table 1. Demographic and clinical characteristics in sedated and non-sedated groups

	Sedated group (n=46)	Non-sedated Group (n=24)	P- value
Male/Female	19/27	14/10	0.175
Age (year)	47.2±15.7	43.7±13.4	0.355
Indications for colonoscopy			0.078
Screening	0	8.3	
Diagnostic	95.7	83.3	
Therapeutic	4.3	8.3	
Hx colonoscopy	47.8	37.5	0.409
Duration of colonoscopy (min)	39.2±15.7	34.6±12.3	0.188
Wait time for colonoscopy (min)	35.7±25.3	29.8±14.8	0.702

Data are presented as mean ± SD or percentage

No significant difference was found between the post-procedure satisfaction level of the sedated and non-sedated groups (Table 2). The mean anxiety score was significantly lower in sedated patients than the other group (47.6±25.9 versus 74.4±16.3, P<0.001).

Table 2. Outcome of colonoscopy in sedated and non-sedated groups

Outcome	Sedated group (n=46)	Non-sedated group (n=24)	P value
Level of satisfaction:			0.720
Poor	0.0	0.0	
Fair	0.0	0.0	
Good	6.5	4.2	
Very good	34.8	33.3	
Excellent	58.7	62.5	
Anxiety score	47.6±25.9	74.4±16.3	<0.001

Data are presented as mean ± SD or percentage

Multivariate regression analysis showed that among all characteristics in studied patients; only history of colonoscopy was an important predictor for the increase of anxiety related to colonoscopy (Table 3).

Table 3. Predictors for anxiety related to colonoscopy

	Univariate analysis		Multivariate analysis		
	Beta	P	Beta	SE	P
Gender	-5.220	0.416	-4.112	6.696	0.542
Age	-0.077	0.716	0.079	0.229	0.733
Indications for colonoscopy	-11.037	0.301	-1.821	12.966	0.889
History of colonoscopy	16.798	0.007	15.214	7.125	0.037
Duration of colonoscopy	-0.117	0.576	-0.019	0.255	0.940
Wait time for colonoscopy	0.130	0.368	0.088	0.146	0.546

Beta: Unstandardized coefficients beta, SE: Standard Error, P: P-value

DISCUSSION

The main goal of colonoscopy is to examine the large bowel with no patient discomfort. Some specialists believe that the sedation use should be avoided during this procedure (11). Some studies also suggest that the majority of the patients are now willing to undergo unsedated endoscopy (12, 13). However, several other studies demonstrate the positive influence of sedation on reduction of patients' anxiety and improvement of patients' satisfaction during colonoscopy.

In the present study, we found that the patients in sedated and non-sedated groups had similar satisfaction level about this procedure; however, the anxiety score in sedated patients was significantly lower than unsedated patients. The results of other studies were different. In a study by Gebbensleben et al, 46% of patients felt a grave or "terrible" anxiety during unsedated colonoscopy (14). In another study by Jones, procedure was associated with a significant increase in state anxiety (7). Kuganeswaran et al. found that the patients who were sedated with midazolam reported less pain and anxiety compared with placebo during the procedure. In their study, physicians also observed less pain and anxiety with midazolam than placebo during the procedure

(15). In Madan study, only 19.5% of patients were willing to undergo colonoscopy without sedation. Among those patients, the willingness dropped to 6.75% postprocedurally. In their study, physicians were least likely to agree to an unsedated procedure (2.2%) (12). It seems that from a patient's perspective, colonoscopy might seem as an invasive procedure with the potential of embarrassment, discomfort, and worry related to potential findings. These concerns can result in anxiety that unfavorably impacts willingness to undergo or the ability to tolerate an endoscopic procedure (16). Even, the results showed significant effects of the procedure on subjective, cardiovascular and endocrinological stress parameters (17). Besides, in Crandall study, no differences in anxiety were reported; however, higher levels of anxiety were associated with higher pain scores at the time of colonoscopy (9). Furthermore, data analysis in Fullhart study revealed no significant difference in post-intervention anxiety between groups (10).

Evidence about the satisfaction level after colonoscopy was also different. In a study by Maslekar, there was no difference between two groups in terms of endoscopist, patients, and nurse satisfaction (18). Also, in Mulcahy study, a similar proportion of patients in each group required intravenous sedation because of discomfort or anxiety during the procedure. The high-dose group experienced less discomfort during endoscope insertion and throughout the examination. Overall satisfaction was almost identical in the two groups and a similar percentage of the high-dose and low-dose groups stated that they would request sedation prior to future endoscopy (19). Studies evaluating patient satisfaction with health care delivery have found in general that the most frequent characteristics associated with dissatisfaction include young age, higher income, higher education, female sex, and psychological distress (20-23). Furthermore, Mahajan found that the type of proced

ure, anxiety I scale, and education level were the best predictors of satisfaction with colonoscopy from the perspective of the patient. He believed that good cooperation during endoscopy was associated with greater patient satisfaction (24).

In our study, among studied criteria, only history of colonoscopy was an important predictor for the increase of anxiety related to colonoscopy and patients' sex and age did not influence the anxiety level. It seems that studied patients had probably no favorable experience during their previous colonoscopies and this procedure could change the patients' perception of this procedure. Mahajan and Campo found that the poor tolerance of previous procedures was an important predictor of poor colonoscopy tolerance (24, 25). Although, we found no relationship between the length of colonoscopy and post-procedure satisfaction, Schutz et al. showed that the patients who underwent longer procedures were more likely to be dissatisfied with conscious sedation used for colonoscopy. They concluded that the termination of a lengthy procedure, offering a further attempt at a later date, and referral to a more experienced endoscopist all might improve patient satisfaction with colonoscopy (26). It seems that several factors might influence patient satisfaction with colonoscopy that need more investigation and in larger sample size.

Finally, it can be concluded that midazolam as a sedative significantly reduces the subjective anxiety during colonoscopy and is a safe and effective premedication before this procedure in patients who require or prefer sedation.

REFERENCES

1. Cappell MS, Friedel D. The role of sigmoidoscopy and colonoscopy in the diagnosis and management of lower gastrointestinal disorders: technique, indications, and contraindications. *Med Clin North Am* 2002;86:1217-52.

2. Kim LS, Koch J, Yee J, Halvorsen R, Cello JP, Rockey DC. Comparison of patients' experiences during imaging tests of the colon. *Gastrointest Endosc* 2001;54:67-74.
3. Froehlich F, Thorens J, Schwizer W, Preisig M, Köhler M, Hays RD, et al. Sedation and analgesia for colonoscopy: patient tolerance, pain, and cardiorespiratory parameters. *Gastrointest Endosc* 1997; 5:1-9
4. Chung YW, Han DS, Yoo KS, Park CK. Patient factors predictive of pain and difficulty during sedation-free colonoscopy: a prospective study in Korea. *Dig Liver Dis* 2007;39:872-76.
5. Coombes JM, Steiner JF, Bekelman DB, Prochazka AV, Denberg TD. Clinical outcomes associated with attempts to educate patients about lower endoscopy: a narrative review. *J Community Health* 2008;33:149-57.
6. Lewis CR, Walker LS, Barnard JA. Children's knowledge, anticipatory anxiety, procedural distress, and recall of esophagogastroduodenoscopy. *J Pediatr Gastroenterol Nutr* 2002;34:68-72.
7. Jones MP, Ebert CC, Sloan T, Spanier J, Bansal A, Howden CW, et al. Patient anxiety and elective gastrointestinal endoscopy. *J Clin Gastroenterol* 2004;38:35-40.
8. Arici G, Kayacan N, Dincer D, Karsli B, Akce S, Cete N, et al. Remifentanyl/midazolam versus tramadol/midazolam use for colonoscopy. *Hepatogastroenterology* 2003;50Suppl2: cclxxxiii-cclxxxvi.
9. Crandall WV, Halterman TE, Mackner LM. Anxiety and pain symptoms in children with inflammatory bowel disease and functional gastrointestinal disorders undergoing colonoscopy. *J Pediatr Gastroenterol Nutr* 2007;44:63-7.
10. Fullhart JW. Preparatory information and anxiety before sigmoidoscopy: a comparative study. *Gastroenterol Nurs* 1992;14:286-90.
11. Takahashi Y, Tanaka H, Kinjo M, Sakumoto K. Prospective evaluation of factors predicting difficulty and pain during sedation-free colonoscopy. *Dis Colon Rectum* 2005;48:1295-300.
12. Madan A, Minocha A. Who is willing to undergo endoscopy without sedation: patients, nurses, or the physicians? *South Med J* 2004;97:800-5.
13. Early DS, Saifuddin T, Johnson JC, King PD, Marshall JB. Patient attitudes toward undergoing colonoscopy without sedation. *Am J Gastroenterol* 1999;94:1862-65.
14. Gebbensleben B, Rohde H. Anxiety before gastrointestinal endoscopy--a significant problem? *Dtsch Med Wochenschr* 1990;115:1539-44.
15. Kuganeswaran E, Clarkston WK, Cuddy PG, Quiason SG, Pandya PK, Dierenfeldt WT, et al. A double-blind placebo controlled trial of oral midazolam as premedication before flexible sigmoidoscopy. *Am J Gastroenterol* 1999;94:3215-19.
16. Parker D. Human responses to colonoscopy. *Gastroenterol Nurs* 1992;15:107-9.
17. Schwenkmezger P, Asshoff H, Schütz S, Buchhorn S. Anxiety and stress reaction and its management in ambulatory gastrointestinal endoscopy: is premedication justified? *Z Gastroenterol* 1997;35:913-20.
18. Maslekar S, Pa B, Hartley JE, Culbert B, Duthie G. Randomised controlled trial of patient controlled sedation for colonoscopy: entonox versus patient maintained target controlled propofol. *Gastrointest Endosc* 2007;65:657-60.
19. Mulcahy HE, Greaves RR, Ballinger A, Patchett SE, Riches A, Fairclough PD, et al. A double-blind randomized trial of low-dose versus high-dose topical anaesthesia in unsedated upper gastrointestinal endoscopy. *Aliment Pharmacol Ther* 1996;10:975-79.
20. Raymond JM, Michel P, Beyssac R. Patients opinion following an upper digestive endoscopy in ambulatory care: Results of a national survey (II). *Gastroenterol Clin Biol* 1996;20:570-74.
21. Waye JD. Perspectives. "International Editorial Board." *Gastrointest Endosc* 1999;50:889-90.
22. Morgan I, Roufeil L, Kaushik S, Bassett M. Influence of coping style and pre-colonoscopy information on pain and anxiety of colonoscopy. *Gastrointest Endosc* 1998;48:119-27.
23. Yacavone RF, Locke GR, Gostout CJ, Rockwood TH, Thieling S, Zinsmeister AR. Factors influencing patient satisfaction with GI endoscopy. *Gastrointest Endosc* 2001;53:703-10.
24. Mahajan RJ, Johnson JC, Marshall JB. Predictors of patient cooperation during gastrointestinal endoscopy. *J Clin Gastroenterol* 1997;24:220-23.
25. Campo R, Brullet E, Montserrat A, et al. Identification of factors that influence tolerance of upper gastrointestinal endoscopy. *Eur J Gastroenterol Hepatol* 1999;11:201-4.
26. Schutz SM, Lee JG, Schmitt CM, Almon M, Baillie J. Clues to patient dissatisfaction with conscious sedation for colonoscopy. *Am J Gastroenterol* 1994;89:1476-79.