

Assessment of Efficacy of Dexmedetomidine and Propofol for Sedation during Gastrointestinal Endoscopy: A Comparative Study

Swati Trivedi¹, Aditya Kumar Tripathi², Rajeev Kumar³

¹Assistant Professor, Department of Anaesthesia, Rama Medical College and Research Centre, Mandhana, Kanpur, U.P., India, ²Senior resident, Department of Anaesthesia, Rama Medical College and Research Centre, Mandhana, Kanpur, U.P., India, ³Professor, Department of Anaesthesia, Rama Medical College and Research Centre, Mandhana, Kanpur, U.P., India.

Abstract

Background: Gastrointestinal Endoscopy is performed as diagnostic and therapeutic procedure. Hence; we compared the clinical profile of propofol and dexmedetomidine in patients undergoing gastrointestinal endoscopy. **Subjects and Methods:** A total of 20 subjects scheduled to undergo gastric endoscopy were included in the present study and were broadly divided into two study groups as follows: Group A: included subjects who were given propofol, Group B: included subjects who were given dexmedetomidine. All the baseline parameters were recorded. Gastric endoscopy was performed in all the patients according to their respective groups. Patient satisfaction score was recorded in all the patients. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. **Results:** Mean heart rate among the subjects of group B at baseline, intraoperative and postoperative time were found to be 72.1, 66.8 and 69.4 respectively. Non- significant results were obtained while comparing the mean heart rate in between the two study groups at different time intervals. Mean PSS (Patient Satisfaction Score) of subjects of propofol group and dexmedetomidine group was found to be 42 and 45 respectively. However; the difference was found to be statistically non-significant. **Conclusion:** Both the anaesthetic solutions can be used with equal effectiveness among patients undergoing gastric endoscopy.

Keywords: Dexmedetomidine, Endoscopy, Propofol.

Corresponding Author: Dr Swati Trivedi, Assistant Professor, Department of Anaesthesia, Rama Medical College and Research Centre, Mandhana, Kanpur, U.P., India.

Received: June 2019

Accepted: July 2019

Introduction

Gastrointestinal Endoscopy is performed as diagnostic and therapeutic procedure. Patients generally experience pain and discomfort and are unable to tolerate the procedure with topical pharyngeal anaesthesia alone. Gastrointestinal endoscopy is a day care procedure and this procedure is difficult to tolerate without sedation.^[1-3]

The best methods for analgesia and sedation during digestive endoscopy are still debated. Providing an adequate regimen of sedation/analgesia may be considered a form of art, which influences, for example, the quality of the examination and the patient's and physician's satisfaction with the sedation. It must be argued that the optimal level of sedation differs according to the procedure being performed. Deep sedation or even general anaesthesia may be preferred for therapeutic procedures in which it is important for a patient to remain immobile.^[4-6]

Hence; we compared the clinical profile of propofol and dexmedetomidine in patients undergoing gastrointestinal endoscopy.

Subjects and Methods

The present study was conducted in the Department of Anaesthesia, Rama Medical College and Research Centre, Mandhana, Kanpur, U.P., India and it included assessment and comparison of clinical profile of propofol and dexmedetomidine in patients undergoing gastrointestinal endoscopy. Ethical approval was obtained from institutional ethical committee. We also obtained written consent from all the patients after explaining in detail the entire research protocol. A total of 20 subjects scheduled to undergo gastric endoscopy were included in the present study and were broadly divided into two study groups as follows:

Group A: included subjects who were given propofol,

Group B: included subjects who were given dexmedetomidine

All the baseline parameters were recorded. Gastric endoscopy was performed in all the patients according to their respective groups. Patient satisfaction score was recorded in all the patients. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test was used for assessment of level of significance.

Results

In the present study, a total of 20 patients scheduled to undergo gastric endoscopy were included in the present study. All the patients were divided broadly into two study groups; group A and Group B. 41.2 years and 42.3 years was the mean age of the subjects of the present study. 60 percent of the patients of the Group A were males while the remaining 40 percent of the patients were females. Mean heart rate among the subjects of group A at baseline, intraoperative and postoperative time were found to be 73.5, 67.1 and 72.5 respectively. Mean heart rate among the subjects of group B at baseline, intraoperative and postoperative time were found to be 72.1, 66.8 and 69.4 respectively. Non-significant results were obtained while comparing the mean heart rate in between the two study groups at different time intervals. Mean PSS (Patient Satisfaction Score) of subjects of propofol group and dexmedetomidine group was found to be 42 and 45 respectively. However; the difference was found to be statistically non-significant.

Table 1: Demographic data

Parameter	Group A	Group B
Mean age (years)	41.2	42.3
Males	6	5
Females	4	5
Mean weight (Kg)	64.9	66.2
Mean height (cm)	163.6	163.8

Table 2: HR value in subjects of both the study group.

Mean heart rate	Group A	Group B	p- value
HR- baseline	73.5	72.1	0.48
HR- intraoperative	67.1	66.8	0.69
HR- postoperative	72.5	69.4	0.84

Table 3: Comparison of PSS in between subjects of the two study groups

Parameter	Group A		Group B		P-value
	Mean	SD	Mean	SD	
PSS	42	6.1	45	5.2	0.25

Discussion

Used as a sedative, propofol, the most popular agent used for these procedures has a narrow therapeutic window-transiting from mild sedation to deep general anesthesia rapidly. GI endoscopic procedures are largely performed in remote locations of major hospitals or free standing endoscopy centers and the quality of help and support available may not be of the same standard as in operating suite. The patient and procedure turnover is high, requiring anesthetic's residual effect to wear off rapidly. Although, the majority belongs to American Society of Anesthesiology (ASA) class I-II, patients with significant co-morbidity are presenting on a regular basis, especially at major hospitals and this number is ever increasing. With advancements in technology, the length and complexity of the procedures has increased; thus, enhancing the need for higher anesthesia depth.^[6-8]

In the present study, a total of 20 patients scheduled to undergo gastric endoscopy were included in the present study. All the patients were divided broadly into two study groups; group A and Group B. 41.2 years and 42.3 years was the mean age of the subjects of the present study. 60 percent

of the patients of the Group A were males while the remaining 40 percent of the patients were females. Wu Y et al compared the effect of propofol vs. dexmedetomidine on the sedation of outpatients during Esophagogastroduodenoscopy (EGD). Prior to the procedure, outpatients received either propofol at 0.6 mg/kg, with additional doses of 10-20 mg until the Observer's Assessment of Alertness/Sedation Scale (OAA/S) score reached 2-4, or dexmedetomidine at a loading dose of 1 µg/kg over a 10-min period followed by a 0.5 µg/kg/h infusion until the OAA/S score reached 2-4. Vital signs, sedation level, adverse events, patients' and endoscopist's satisfaction score, and an evaluation of the recovery time were assessed. Negligible haemoglobin oxygen saturation (SpO₂) and respiratory rate variations were observed in both groups, although respiratory depression occurred in two cases (5.9%) in the propofol group. Mean arterial pressure (MAP) in the propofol group decreased during the procedure compared with baseline (P < 0.05) and was also lower in comparison with the dexmedetomidine group (P < 0.05). Heart rate (HR) decreased after the loading dose in the dexmedetomidine group (P < 0.05). More patients in the propofol group underwent deeper sedation at the beginning of the procedure (P < 0.05), although the recovery time was comparable between the two groups (P > 0.05). Three cases (9.1%) in the dexmedetomidine group were delayed because of dizziness, bradycardia and nausea. There was a higher satisfaction score among patients in the propofol group (P < 0.05), although the endoscopist's satisfaction score was comparable between the two groups (P > 0.05). Propofol and dexmedetomidine provide a relatively satisfactory level of sedation without clinically notable adverse effects during EGD.^[10]

In the present study, mean heart rate among the subjects of group A at baseline, intraoperative and postoperative time were found to be 73.5, 67.1 and 72.5 respectively. Mean heart rate among the subjects of group B at baseline, intraoperative and postoperative time were found to be 72.1, 66.8 and 69.4 respectively. Non-significant results were obtained while comparing the mean heart rate in between the two study groups at different time intervals. Mean PSS (Patient Satisfaction Score) of subjects of propofol group and dexmedetomidine group was found to be 42 and 45 respectively. However; the difference was found to be statistically non-significant. Nishizawa T et al conducted a meta-analysis of data from randomized controlled trials that compared dexmedetomidine with propofol. They searched PubMed, the Cochrane library, and the Igaku-chuo-zasshi database for randomized trials eligible for inclusion in our meta-analysis. They identified six eligible randomized trials from the database search, and compared the effect of propofol versus dexmedetomidine with respect to: (a) patient's satisfaction level, (b) body movement or gagging, (c) cardiopulmonary complications, and (d) change in heart rate. Compared to propofol, dexmedetomidine significantly decreased the patient's satisfaction level, and there was no significant heterogeneity among the trial results. The pooled RD for developing body movement or gagging when using dexmedetomidine was 0.107, with no significant differences. Compared with propofol, the pooled RD for hypotension, hypoxia, and bradycardia with dexmedetomidine sedation

0
 were -0.029 (95% CI: -0.11 to 0.05), -0.080 (95% CI: -0.178 to 0.018), and 0.022 (95% CI: -0.027 to 0.07), respectively, with no significant differences. Compared to propofol, dexmedetomidine significantly decreased the heart rate (WMD: -10.41 , 95% CI: -13.77 to -7.051 , $p \leq 0.0001$), without significant heterogeneity. In gastrointestinal endoscopy, patient satisfaction level was higher in propofol administration, when compared to dexmedetomidine.^[11]

Conclusion

Under the light of above obtained data, the authors conclude that both the anaesthetic solutions can be used with equal effectiveness among patients undergoing gastric endoscopy.

References

1. Manolaraki MM, Stroumpos C, Paspatis GA. Sedation in Gastrointestinal Endoscopies [Part 1] *Annals Gastroenterol.* 2009;22:90–96.
2. Qadeer MA, Vargo JJ, Khandwala F, Lopez R, Zuccaro G. Propofol versus traditional sedative agents for gastrointestinal endoscopy: a meta-analysis. *ClinGastroenterolHepatol.* 2005;3:1049–1056.
3. Dere K, Sucullu I, Budak ET, Yeyen S, Filiz AI, Ozkan S, Dagli G. A comparison of dexmedetomidine versus midazolam for sedation, pain and hemodynamic control, during colonoscopy under conscious sedation. *Eur J Anaesthesiol.* 2010;27:648–652.
4. Amorniyotin S. Sedative and Analgesic Drugs for Gastrointestinal Endoscopic Procedure. *Journal of Gastroenterology and Hepatology Research* 2014; 3(7): 1133-1144.
5. Hsieh YH, Chou AL, Lai YY, Chen BS, Sia SL, Chen IC, Chang YL, Lin HJ. Propofol alone versus propofol in combination with meperidine for sedation during colonoscopy. *J ClinGastroenterol.* 2009;43:753–757.
6. Takimoto K, Ueda T, Shimamoto F, Kojima Y, Fujinaga Y, Kashiwa A, Yamauchi H, Matsuyama K, Toyonaga T, Yoshikawa T. Sedation with dexmedetomidine hydrochloride during endoscopic submucosal dissection of gastric cancer. *Dig Endosc.* 2011;23:176–181.
7. Muller S, Borowics SM, Fortis EA, Stefani LC, Soares G, Maguilnik I, Breyer HP, Hidalgo MP, Caumo W. Clinical efficacy of dexmedetomidine alone is less than propofol for conscious sedation during ERCP. *GastrointestEndosc.* 2008;67:651–659.
8. Ferreira AO, Cravo M. Sedation in gastrointestinal endoscopy: Where are we at in 2014? *World Journal of Gastrointestinal Endoscopy.* 2015;7(2):102-109.
9. Dripps RD, Lamont A, Eckenhoff JE. The role of anesthesia in surgical mortality. *JAMA.* 1961;178:261–266.
10. Wu Y1, Zhang Y1, Hu X1, Qian C2, Zhou Y2, Xie J2. A comparison of propofol vs. dexmedetomidine for sedation, haemodynamic control and satisfaction, during esophagogastroduodenoscopy under conscious sedation. *J Clin Pharm Ther.* 2015 Aug;40(4):419-25.
11. Nishizawa T, Suzuki H, Hosoe N, Ogata H, Kanai T, Yahagi N. Dexmedetomidinevspropofol for gastrointestinal endoscopy: A meta-analysis. *United European Gastroenterology Journal.* 2017;5(7):1037-1045.

Copyright: © the author(s), publisher. Academia Anesthesiologica International is an Official Publication of “Society for Health Care & Research Development”. It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Trivedi S, Tripathi AK, Kumar R. Assessment of Efficacy of Dexmedetomidine and Propofol for Sedation During Gastrointestinal Endoscopy: A Comparative Study. *Acad. Anesthesiol. Int.* 2019;4(2):52-54.

DOI: [dx.doi.org/10.21276/aan.2019.4.2.13](https://doi.org/10.21276/aan.2019.4.2.13)

Source of Support: Nil, **Conflict of Interest:** None declared.