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Original Article

Comparative Evaluation of Efficacy of Dexmedetomidine and Propofol for Sedation in Patients Undergoing Gastrointestinal Endoscopy

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ABSTRACT:

Background: Gastrointestinal Endoscopy is performed as diagnostic and therapeutic procedure. Data from a recent meta-analysis suggest that propofol sedation is not associated with an increased risk of complications. Dexmedetomidine can be safely used as a sedoanalgesic agent in colonoscopies because it provides efficient haemodynamic stability, higher satisfaction scores and lower Numeric Rating Scale scores. Under the light of above mentioned data, we planned the present study to compare the efficacy of propofol and dexmedetomidine in patients undergoing gastrointestinal endoscopy. **Materials & methods:** The present study included comparison of efficacy of propofol and dexmedetomidine in patients undergoing gastrointestinal endoscopy. A total of 40 patients scheduled to undergo gastrointestinal endoscopy were included in the present study and were broadly divided into two study groups: **Group I**: 20 Patients receiving propofol, **Group II**: 20 Patients receiving dexmedetomidine. Modified aldrete score (MAS) was calculated based on the criteria described previously in the literature.[8- 10] All the results were analyzed by SPSS software. **Results:** Mean time to MAS was significantly higher for the propofol group (451.5 seconds) in comparison to the dexmedetomidine group (140.8 seconds). Mean PSS (Patient Satisfaction Score) of subjects of propofol group and dexmedetomidine group was found to be 41 and 43 respectively. However; the difference was found to be statistically non-significant. **Conclusion:** Although both the analgesic agents were statistically equally effective, efficacy of dexmedetomidine might be more in patients undergoing endoscopy.

Key words: Dexmedetomidine, Endoscopy, Propofol.

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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]

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.[2-4] Data from a recent meta-analysis suggest that propofol sedation is not associated with an increased risk of complications. In fact, propofol sedation for colonoscopy was associated with lower complication rates than sedation with traditional agents. Dexmedetomidine can be safely used as a sedoanalgesic agent in colonoscopies because it provides efficient haemodynamic stability, higher satisfaction scores and lower Numeric Rating Scale scores.[5- 7] However, dexmedetomidine alone is most likely not as effective as propofol combined with fentanyl for providing conscious sedation during endoscopic retrograde cholangio pancreatography (ERCPs), exhibiting concurrently greater haemodynamic instability and prolonged recovery.[8, 9]

Under the light of above mentioned data, we planned the present study to compare the efficacy of propofol and dexmedetomidine in patients undergoing gastrointestinal endoscopy.

MATERIALS & METHODS

The present study was conducted in the department of general anaesthesia of the medical institute and it

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included comparison of efficacy of propofol and dexmedetomidine in patients undergoing gastrointestinal endoscopy. A total of 40 patients scheduled to undergo gastrointestinal endoscopy were included in the present study and were broadly divided into two study groups:

- **Group I**: 20 Patients receiving propofol
- **Group II**: 20 Patients receiving dexmedetomidine

Inclusion criteria:

- Age group between 18 -60 years
- ASA Grade 1 and 2
- Procedure - Gastrointestinal Endoscopy

Exclusion criteria:

- Patient refusal to participate
- Age < 18 years
- ASA Grade 3 and above
- Pregnant patients

Ethical approval was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. Anesthesia was given to all the patients according to their respective study groups. Modified aldrete score (MAS) was calculated based on the criteria described previously in the literature.[8- 10] All the results were analyzed by SPSS software. Chi- square test was used for assessment of level of significance.

RESULTS

Table 1 shows the mean age and weight of the subjects of both the study groups. Mean age of the subject of the propofol group and the dexmedetomidine group was 42.2 years and 41 years respectively. Mean weight of the subject of the propofol group and the dexmedetomidine group was 66.4 Kg and 68.2 Kg respectively. Table 2 shows the gender distribution of subjects of the present study. 5 patients (25 percent) of the propofol group and 7 patients (35 percent) of the dexmedetomidine group were males while remaining were females respectively. Statistically non-significant results were obtained while comparing the mean duration in between the two study groups (P- value > 0.05). Mean time to MAS was significantly higher for the propofol group (451.5 seconds) in comparison to the dexmedetomidine group (140.8 seconds) (P- value < 0.05). Mean PSS (Patient Satisfaction Score) of subjects of propofol group and dexmedetomidine group was found to be 41 and 43 respectively. However; the difference was found to be statistically non-significant.

Table 1: Mean age and weight of the subjects of both the study groups

Parameter	Propofol group	Dexmedetomidine group	P- value
Mean age (years)	42.2	41	.41
Mean weight (Kg)	66.4	68.2	.52

Table 2: Gender distribution subjects of both the study groups

Gender	Propofol group		Dexmedetomidine group	
	Number of subjects	Percentage	Number of subjects	Percentage
Male	16	40	20	50
Female	24	60	20	50
Total	40	100	40	100

Table 3: Descriptive Statistics of duration propofol group and the dexmedetomidine group

Parameter	**Propofol group**		**Dexmedetomidine group**		P- value
	Mean	**SD**	**Mean**	**SD**	
Duration (Minutes)	30.4	0.6	29.5	0.7	0.8

Table 4: Descriptive Statistics of mean MAS time in propofol group and the dexmedetomidine group

Parameter	**Propofol group**		**Dexmedetomidine group**		P- value
	Mean	**SD**	**Mean**	**SD**	
Time MAS sec	451.5	21.3	140.8	5.7	.001

Table 5: Comparison of PSS in between subjects of the two study groups

Parameter	**Propofol group**		**Dexmedetomidine group**		P- value
	Mean	**SD**	**Mean**	**SD**	
PSS	41	6.5	43	5.8	0.55

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DISCUSSION

Propofol is a phenol derivative with sedative, hypnotic and anesthetic properties. It has antiemetic, anxiolytic, hypnotic, amnestic and anesthetic properties. However, it does not have analgesic effects. Dexmedetomidine is a centrally acting alpha 2-adrenoreceptor agonist with sedative and analgesic effects. It also has been considered for sedation for GIE procedure.[10- 12] Mean age of the subject of the propofol group and the dexmedetomidine group was 42.2 years and 41 years respectively. Mean weight of the subject of the propofol group and the dexmedetomidine group was 66.4 Kg and 68.2 Kg respectively. Wang D et al (2013) assessed the efficacy and safety of sedation of propofol combined with traditional sedative agents (PTSA) for gastrointestinal endoscopy, conducted a meta-analysis of randomized controlled trials (RCTs) comparing PTSA with propofol-alone sedation. Cardiopulmonary complications (i.e., hypoxia, hypotension, arrhythmia, and apnea), total dose of propofol used and amnesia were assessed. Nine original RCTs investigating a total of 1,505 patients, of whom, 805 received PTSA sedation and 700 received propofol-alone sedation, met the inclusion criteria. Compared with propofol-alone sedation, the pooled relative risk with the use of PTSA sedation for developing hypoxia, hypotension, arrhythmias, and apnea for all the procedures combined was 0.93 (95% CI, 0.30-2.92), 1.32 (95% CI, 0.38-4.64), 2.61 (95% CI, 0.23-29.29) and 2.81 (95% CI, 0.27-29.07), with no significant difference between the groups. The pooled mean difference in total dose of propofol used was -40.01 (95% CI, -78.96 to -1.05), which showed a significant reduction with use of PTSA sedation. The pooled relative risk for amnesia was 0.97 (95% CI, 0.88-1.07), suggesting no significant difference between the groups. PTSA sedation during gastrointestinal endoscopy could significantly reduce the total dose of propofol, but without benefits of lower risk of cardiopulmonary complications compared with propofol-alone sedation.[13]

In the present study, 5 patients (25 percent) of the propofol group and 7 patients (35 percent) of the dexmedetomidine group were males while remaining were females respectively. Statistically non-significant results were obtained while comparing the mean duration in between the two study groups (P- value > 0.05). Mean time to MAS was significantly higher for the propofol group (451.5 seconds) in comparison to the dexmedetomidine group (140.8 seconds) (P- value < 0.05). Mean PSS (Patient Satisfaction Score) of subjects of propofol group and dexmedetomidine group was found to be 41 and 43 respectively. However; the difference was found to be statistically non-significant. Hannallah M et al (2013) evaluated the efficacy and safety of dexmedetomidine/ propofol anesthesia for patients with obstructive sleep apnea (OSA) characteristics without endotracheal intubation during upper gastrointestinal(GI) endoscopy. Twenty patients undergoing upper GI endoscopy who were considered high probability of having OSA based on an adjusted neck circumference greater than 48 were enrolled in the study. Dexmedetomidine 1 mcg/kg bolus was given over 10 min followed by propofol boluses until adequate depth of anesthesia was achieved. Propofol infusion was used to maintain anesthesia. Blood pressure, heart rate, and O2 saturation were recorded before, during, and after the procedure. The endoscopists evaluated the anesthesia condition on a 10 points numerical scale. Post-Anesthesia Care Unit (PACU) time was recorded. The following day, patients were questioned about complications and were asked to evaluate their overall anesthesia experience on a 10 points numerical scale. Fifteen males and five females aged 51 ± 8 years were enrolled. Their BMI was 34.7 ± 8.4, and their adjusted neck circumference was 53.4 ± 3.4. Propofol induction dose was 0.8 ± 0.4 mg/kg; and PACU time was 67.5 ± 26.7 min. Two patients developed transient hypoxemic episodes during the procedure. Transient hypotension was experienced by three patients during the procedure and three patients in PACU. The evaluation score was 9 ± 1.7 by the endoscopists, and 8 ± 2.3 by the patients. After discharge, 16 patients complained of drowsiness, two patients reported dysphoric symptoms, and one patient complained of dry mouth. Dexmedetomidine / propofol combination can provide satisfactory anesthesia for upper GI endoscopy in OSA patients. The technique provides an alternative to endotracheal intubation in these high risk patients.[14]

CONCLUSION

Under the light of above mentioned data, the authors conclude that although both the analgesic agents were statistically equally effective, efficacy of dexmedetomidine might be more in patients undergoing endoscopy.

REFERENCES

1. VanNatta ME, Rex DK. Propofol alone titrated to deep sedation versus propofol in combination with opioids and/or benzodiazepines and titrated to moderate sedation for colonoscopy. Am J Gastroenterol. 2006;101:2209–2217.
2. Paspatis GA, Manolaraki MM, Vardas E, Theodoropoulou A, Chlouverakis G. Deep sedation for endoscopic retrograde cholangiopancreatography: intravenous propofol alone versus intravenous propofol with oral midazolam premedication. Endoscopy. 2008;40:308–313
3. 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.
4. Triantafillidis JK, Merikas E, Nikolakis D, Papalois AE. Sedation in gastrointestinal endoscopy: Current issues. World Journal of Gastroenterology : WJG. 2013;19(4):463-481.
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 Clin Gastroenterol. 2009;43:753–757.
6. Jalowiecki P1, Rudner R, Gonciarz M, Kawecki P, Petelenz M, Dziurdzik P. Sole use of dexmedetomidine has limited utility for conscious sedation during outpatient colonoscopy. Anesthesiology. 2005 Aug;103(2):269-73.

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7. Vetsa M, Walter MH, Olafsson S, Condon DS, Zhao YS, Lewis TD, Srikureja W. The use of dexmedetomidine for gastrointestinal endoscopic procedures in difficult to sedate cohort: a single institution experience. Gastrointest Endosc. 2010;71:AB248.
8. Vázquez-Reta JA1, Jiménez Ferrer MC, Colunga-Sánchez A, Pizarro-Chávez S, Vázquez-Guerrero AL, Vázquez-G*uerrero AR. Midazolam versus dexmedetomidine for sedation for upper gastrointestinal endoscopy. Rev Gastroenterol Mex. 2011 Jan-Mar;76(1):13-8.
9. Bo LL1, Bai Y, Bian JJ, Wen PS, Li JB, Deng XM. Propofol vs traditional sedative agents for endoscopic retrograde cholangiopancreatography: a meta-analysis. World J Gastroenterol. 2011 Aug 14;17(30):3538-43.
10. Tsai HC, Lin YC, Ko CL, et al. Propofol versus midazolam for upper gastrointestinal endoscopy in cirrhotic patients: a meta-analysis of randomized controlled trials. PLoS One. 2015;10:e0117585
11. Sethi P, Mohammed S, Bhatia PK, Gupta N. Dexmedetomidine versus midazolam for conscious sedation in endoscopic retrograde cholangiopancreatography: An open-label randomised controlled trial. Indian J Anaesth 2014;58:18-24.
12. Fagà E, De Cento M, Giordanino C, Barletti C, Bruno M, Carucci P et al. Safety of propofol in cirrhotic patients undergoing colonoscopy and endoscopic retrograde cholangiography: results of a prospective controlled study. Eur J GastroenterolHepatol. 2012 Jan;24(1):70-6.
13. Wang D, Wang S, Chen J, Xu Y, Chen C, Long A, Zhu Z et al. Propofol combined with traditional sedative agents versus propofol-alone sedation for gastrointestinal endoscopy: a meta-analysis. Scand J Gastroenterol. 2013 Jan;48(1):101-10.
14. Hannallah M, Rasmussen M, Carroll J, Charabaty A, Palese C, Haddad N. Evaluation of dexmedetomidine/propofol anesthesia during upper gastrointestinal endoscopy in patients with high probability of having obstructive sleep apnea. Anaesth Pain & Intensive Care 2013;17(3):258-260.

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