Original Article

DOI: 10.7860/JCDR/2023/60334.18087

Comparison of General Anaesthesia and Epidural Anaesthesia in Lumbar Microdiscectomies- A Prospective Comparative Study

Anaesthesia Section

DONA ELSA JOSE[1], LITHA MARY MATHEW[2], IVAN KOSHY[3], ANITA MATHEW[4], P GANAPATHI[5]

ABSTRACT

Introduction: Lumbar Microdiscectomy (LMD) is most commonly performed under General Anaesthesia (GA). Regional techniques are being used more widely now, with Epidural Anaesthesia (EA) being safer than Spinal Anaesthesia (SA). Regional anaesthetic methods are being used increasingly, with EA being less harmful than spinal with respect to cardiac and neurological complications.

Aim: To compare the intraoperative and postoperative outcomes of GA and EA in single level lumbar microdiscectomies.

Materials and Methods: This prospective comparative study was conducted at a single tertiary care centre between April 2014 to April 2018 and study was conducted among 40 patients who were posted for single level lumbar microdiscectomies. The patients underwent surgery under group GA and group EA. Intraoperatively, parameters like Heart Rate (HR), Mean Arterial Pressure (MAP), Surgical Onset Time (SOT), Surgical Time (ST), Total Operating room Time (TOT) and postoperatively Visual Analog Scale (VAS) for pain, the Total Analgesic Dose (TAD) of fentanyl, Postoperative Nausea and Vomiting (PONV) and the level of satisfaction with regard to pain relief (4-point Likert scale) for the first 24 hours were compared. The data were analysed using Statistical Package for Social Sciences (SPSS) version 18 software. Mean, percentage, student's t-test, χ^2 test, Mann-whitney test and appropriate statistical tests were used.

Results: A total of 40 patients were enrolled in the present study with rather similar demographic characteristics in both groups. The SOT was significantly more in the EA group (24.30±2.958 min) when compared to the GA group (14.05±2.259) minutes. However, the ST and TOT did not show much of a difference. Intraoperatively, group GA showed significantly high HR and MAP values when compared to group EA ($p<0.001$). Postoperatively, VAS for pain and the TAD of fentanyl were found to be significantly lesser in the EA group, when compared to GA group. The incidence of Postoperative Nausea and Vomiting (PONV) was less in EA group. The level of satisfaction with regard to pain relief at the end of first 24 hours was more among patients in EA group.

Conclusion: The present study concludes that, EA may be used as an alternative to GA in single level lumbar microdiscectomies.

Keywords: 4-point likert scale, Lumbar discectomies, Postoperative nausea and vomiting, Regional anaesthesia, Visual analogue scale

INTRODUCTION

The lumbar microdiscectomy is most commonly completed under general anaesthesia. But this method has numerous perioperative morbidities including blood loss, increased MAP and HR, postoperative pain, nausea, vomiting and prolonged postanaesthesia recovery period [1]. The potential to perform a surgery of a long duration in prone position without compromising the airway is the principal gain of using GA [2]. Regional anaesthetic methods are being used increasingly, with EA being less harmful than spinal with respect to cardiac and neurological complications. The potential benefits of EA in microdiscectomy include prevention of brachial plexus and face injury due to self-positioning by awake patient, no airway manipulation, reduced want for opioids, preservation of protective reflexes and less operative blood loss. There is also a notable decrease in postoperative pain, PONV, stress responses and thromboembolism [3]. The complications and limitations are accidental injection of local anaesthetic intravascularly or into the subarachnoid space, epidural abscess, neurological injury, urinary retention and slow onset of anaesthesia [4]. Previous studies reported reduced intraoperative HRs and MAPs thereby decreased blood loss, lower incidence of postoperative analgesic requirement and decreased pain scores for regional anaesthesia [5,6].

The present study was undertaken to compare between GA and EA for single level lumbar microdiscectomies. The primary outcome of the present study was to compare SOT, ST, TOT, intraoperative HR and MAP the TAD of fentanyl and postoperative VAS scores for pain for the first 24 hours. The secondary outcome measures were PONV and the level of satisfaction with regard to pain relief (using 4-point Likert scale) at the end of the first 24 hours.

MATERIALS AND METHODS

This prospective comparative study was conducted among 40 patients who were posted for single level lumbar microdiscectomies in a single tertiary care centre in South India. The duration of the study was from, April 2014 to April 2018. The study was approved by Institutional Research Board and Ethics Committee (04/EC/KVGMC/2013).

Inclusion criteria: Patients were randomly allocated into GA or EA groups using sealed envelopes method with 20 patients in each group. Patients coming for elective LMD in the age group of 18-60 years belonging to American Society of Anaesthesiologist (ASA) grade I or II were included in the present study.

Exclusion criteria: Patients who had ASA grade III or above, coagulopathy or anticoagulation treatment (International normalised ratio >1.5), infection at the site of injection, congenital abnormalities of lower spine, raised intracranial tension, active disease of central nervous system, history of allergy, obese (body mass index >30 Kg/m^2), obstructive sleep apnoea, uncontrolled systemic illness like diabetes mellitus, hypertension, and uncorrected hypovolaemia were excluded from the present study.

Sample size calculation: During the pilot study, the difference between the mean MAP in the two groups was calculated to be 10 mmHg. In accordance with this finding and with α=0.05 and a power of 80%, a sample size of 19 patients were required in one

group. Hence, a total of 40 patients (20 in GA and 20 in EA) were selected for the study.

Study Procedure

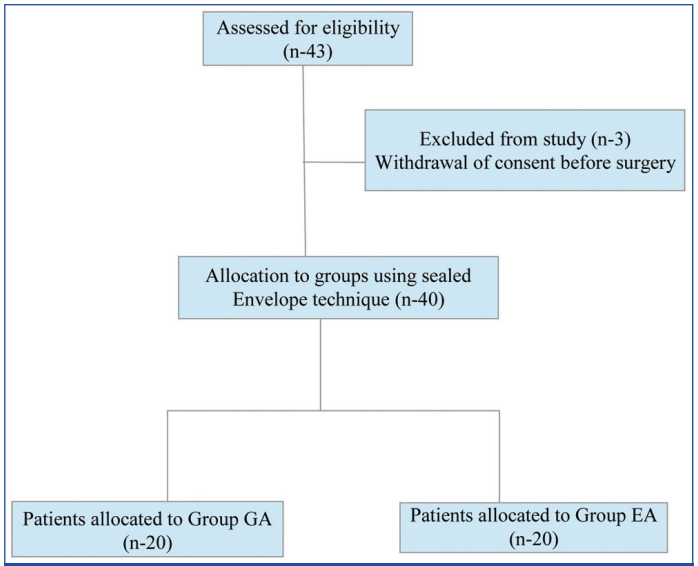
A single surgeon and anaesthesiologist were responsible for performing all the operations. Surgery was performed in prone position. Routine monitors like Electrocardiograph (ECG), Non Invasive Blood Pressure (NIBP) and Pulse Oximetry (SpO^2) were applied in the operating room. Baseline readings were recorded and venous access obtained. All patients receiving GA were given glycopyrrolate 0.01 mg/kg, midazolam 0.05 mg/kg, propofol (2 mg/kg), fentanyl (2 µg/kg) and vecuronium 0.1 mg/kg. Anaesthesia was maintained with intermittent vecuronium 0.05 mg/kg, isoflurane (0.4-1.5%), nitrous oxide and oxygen. In the patients receiving EA needle puncture and catheterisation of the epidural space was performed 2-3 segments above the expected site of surgery. An epidural catheter was passed through an 18 G Touhy needle into the epidural space with the catheter tip downwards 5 cm into the space. A 3 mL of 2% lignocaine with epinephrine 1:200000 was given as test dose. Then 10 mL-12 mL of 0.5% bupivacaine, fentanyl 2 µg/mL were injected into the epidural space slowly over a period of three minutes. Patients were put in prone position after achieving the desired level of anaesthesia. Silicon gel pads and beds were used to minimise the discomfort. Patients were given 5 mL of 0.5% bupivacaine every hour to maintain the anaesthesia. All patients were monitored for cardiorespiratory problems, side-effects if any and were given supplemental oxygen (4 L/min).

- SOT was taken from the time of induction (in GA group) or injection of the drug into the epidural space (in EA group) till the time of surgical incision.
- ST was taken from the time of surgical incision till the time of last suture.
- TOT was taken as the total duration of time the patients were inside the operating room (which included the ST and the SOT also).
- Hypotension (defined as a decrease in systolic blood pressure >30% of the baseline value or systolic blood pressure <90 mm Hg) was treated with intravenous bolus of 6 mg ephedrine.
- Bradycardia (defined as a pulse rate of <60 beat/minute) was treated with i.v. boluses of 0.6 mg atropine.

Postoperatively, the patients were transferred to the Postanaesthesia Care Unit (PACU) where an anaesthetist and a nurse unaware of the study protocol observed the patients. The assessment of analgesia was done using VAS for pain every hourly for the first six hours, every 2nd hourly till 12 hours and 4th hourly till the end of study period. An i.v. bolus dose of fentanyl 1 µg/kg diluted to 10 mL with 0.9% normal saline was given in the GA group and an epidural bolus dose of fentanyl one microgram/kg diluted to 10 mL with 0.9% normal saline was given in the EA group when the patients complained of pain and the VAS was more than four. Haemodynamic parameters were monitored every five minutes for 20 minutes after both. The total analgesic requirements in both groups were recorded at the end of 24 hours. The epidural catheter was removed under aseptic precautions after the study period. Occurrence of PONV was assessed with a 4-point scale (0=no nausea, 1=slight nausea, 2=moderate nausea, 3=severe nausea with vomiting) at the end of the study period (i.e., first 24 hours). Level of satisfaction with regard to pain relief (using 4-point Likert scale) was measured at the end of first 24 hours after surgery. The outcome from each group was compared and listed as benefits and disadvantages of GA and EA in single level lumbar microdiscectomies. [Table/Fig-1] shows the patient selection flow diagram.

STATISTICAL ANALYSIS

The data were analysed using SPSS (Chicago, IL) version 18.0 software. Quantitative variables were assessed using appropriate measures of central tendency (mean/median) and variance (standard deviation/Interquartile range). Descriptive statistical analysis has been carried out in the present study. Categorical variables were reported using frequencies and percentages. The χ^2 test, the Student's t-test and the Mann-whitney test were used for comparing the variables between the two groups. With the confidence interval set to 95% and the margin of error accepted to 5%, the p-value was considered significant as the following: p-value <0.05 was considered significant, p-value <0.001 was considered as highly significant, p-value >0.05 was considered non significant.



[Table/Fig-1]: Patient selection flow diagram.

RESULTS

Demographic and clinical characteristics of the study population stratified by anaesthesia type are summarised in [Table/Fig-2]. There was a total of 23 males (58%) and 17 females (42%) who participated in the present study. Both the groups were similar with respect to age, weight, height and gender.

Variables	GA (n=20)	EA (n=20)	p-value
Mean age (SD)	46.35 (5.88)	46.40 (7.11)	0.981
Male, n (%)	11 (55%)	12 (60%)	>0.05
Female, n (%)	9 (45%)	8 (40%)	
Mean weight (SD)	69.55 (5.5)	68.30 (6.10)	0.501
Mean height (SD)	166.35 (7.15)	166.85 (7.05)	0.825

[Table/Fig-2]: Demographic and clinical data.

The SOT was more in the EA group when compared to the GA group and the difference was highly significant. But ST and TOT was comparable as shown in [Table/Fig-3].

Parameters	Groups	Mean±Std. Deviation	p-value
SOT	GA	14.05±2.259	<0.001
	EA	24.30±2.958	
ST	GA	128.75±15.131	>0.05
	EA	124.20±18.791	
TOT	GA	160.75±16.733	<0.001
	EA	140.05±17.916	

[Table/Fig-3]: Comparison of Surgical Onset Time (SOT) and Surgical Time (ST) and Total Operating room Time (TOT) among patients in both the groups.

The intraoperative MAP and HR were compared using Student's t-test [Table/Fig-4,5]. Group GA showed higher intraoperative MAP and HR values when compared to group EA and it was statistically highly significant. Out of 40 patients, 20 patients in the GA group received fentanyl for postoperative analgesia through i.v. route. Rest of the patients received postoperative analgesia through epidural route.

MAP	Group (n)	Mean±Std. Deviation	p-value
Baseline	GA (20)	95.95±5.605	0.72
	EA (20)	96.65±6.523	
5 min	GA (20)	104.30±4.780	<0.001
	EA (20)	82.45±6.525	
10 min	GA (20)	107.20±5.764	<0.001
	EA (20)	74.80±7.709	
20 min	GA (20)	98.85±6.081	<0.001
	EA (20)	68.35±6.869	
30 min	GA (20)	91.65±7.036	<0.001
	EA (20)	69.50±6.403	
45 min	GA (20)	85.95±4.261	<0.001
	EA (20)	70.50±3.620	
60 min	GA (20)	84.70±5.079	<0.001
	EA (20)	72.85±3.801	
90 min	GA (20)	84.80±4.916	<0.001
	EA (20)	72.60±4.477	
120 min	GA (15)	88.07±7.411	<0.001
	EA (12)	75.17±4.108	
150 min	GA (3)	88.67±11.015	<0.001
	EA (3)	79.33±11.547	

[Table/Fig-4]: Mean Arterial Pressure (MAP) variations in both groups.

MAP	Group (n)	Mean±Std. Deviation	p-value
Baseline	GA (20)	73.25±7.793	0.4
	EA (20)	71.55±4.536	
5 min	GA (20)	82.85±7.714	<0.001
	EA (20)	67.00±4.834	
10 min	GA (20)	84.25±6.927	<0.001
	EA (20)	63.45±5.472	
20 min	GA (20)	79.25±6.576	<0.001
	EA (20)	59.50±6.287	
30 min	GA (20)	77.15±5.204	<0.001
	EA (20)	61.85±5.244	
45 min	GA (20)	75.10 ±4.266	<0.001
	EA (20)	63.10 ±3.824	
60 min	GA (20)	74.55±5.286	<0.001
	EA (20)	63.10±3.684	
90 min	GA (20)	73.15 ±4.848	<0.001
	EA (20)	63.95±4.019	
120 min	GA (15)	73.87±5.462	<0.001
	EA (12)	63.92± 2.811	
150 min	GA (3)	76.33± 2.082	<0.001
	EA (3)	64.00±2.000	

[Table/Fig-5]: Mean Heart Rate (HR) variations in both groups.

The VAS scores for pain were compared using Mann–Whitney test [Table/Fig-6]. Till the 3rd postoperative hour VAS scores were significantly very less in the EA group when compared to the GA group. The overall VAS scores for pain were found to be significantly lesser in the EA group when compared to GA group throughout the study period i.e., 24 hours. The TAD of fentanyl used in GA group was much higher than in the EA group and was statistically highly significant [Table/Fig-7]. There was slight nausea in 9 (22.5%) patients, out of which, six patients belonged to GA group [Table/Fig-8]. Three patients had moderate nausea, out of which 2 (10%) were in GA group. One patient from the GA group had severe nausea with vomiting.

A total of 16 (40%) patients were totally satisfied with regard to pain relief for the initial postoperative period, out of which 14 (70%) patients were from the epidural group. None of the patients were totally dissatisfied with the pain relief [Table/Fig-9].

VAS	Group	N	Mean±SD	p-value
1st hour	GA	20	2.65±1.17	<0.001
	EA	20	1.05±0.65	
2nd hour	GA	20	4.10±1.25	<0.001
	EA	20	1.65±0.77	
3rd hour	GA	20	5.05±1.65	<0.001
	EA	20	2.6±0.81	
4th hour	GA	20	3.25±1.15	0.113
	EA	20	3.95±1.02	
5th hour	GA	20	5.0±1.45	<0.001
	EA	20	2.6±0.62	
6th hour	GA	20	4.25±1.54	0.247
	EA	20	3.95±1.05	
8th hour	GA	20	5.3±1.31	0.225
	EA	20	3.6±0.58	
10th hour	GA	20	5.0±1.74	<0.005
	EA	20	2.9±0.71	
12th hour	GA	20	4.25±1.21	0.487
	EA	20	4.45±1.25	
16th hour	GA	20	6.5±1.87	0.397
	EA	20	5.3±1.19	
20th hour	GA	20	4.20±1.28	<0.005
	EA	20	2.9±0.79	
24th hour	GA	20	4.9±1.11	<0.001
	EA	20	2.05±0.69	

[Table/Fig-6]: Comparison of Visual Analogue Scale (VAS) for pain scores among patients in both the groups.

	Groups	N	Mean	Std. Deviation	p-value
TAD	GA	20	221.25	25.917	<0.001
	EA	20	137.30	12.075	

[Table/Fig-7]: Comparison of Total Analgesic Dose (TAD) of fentanyl (in micrograms) among patients in both the groups.

PONV	Score	GA (%)	EA (%)
No nausea	0	11 (55%)	16 (80%)
Slight nausea	1	6 (30%)	3 (15%)
Moderate nausea	2	2 (10%)	1 (5%)
Severe nausea with vomiting	3	1 (5%)	0

[Table/Fig-8]: Comparison of Postoperative Nausea and Vomiting (PONV).

Level of satisfaction	Score	GA (%)	EA (%)
Totally dissatisfied	1	0	0
Moderately dissatisfied	2	9 (45%)	1 (5%)
Reasonably satisfied	3	9 (45%)	5 (25%)
Totally satisfied	4	2 (10%)	14 (70%)

[Table/Fig-9]: Comparison of level of satisfaction with regard to pain relief for the initial postoperative period (24 h).

DISCUSSION

The GA is the conventional method in use for LMD and other spinal surgeries. In modern era of surgery both spinal and EA are becoming more popular [1,3,5,6]. In a retrospective study, 544 patients undergoing lumbar spinal surgery, it was concluded that, SA was atleast, as effective as, GA for performing elective lumbar decompression surgeries and proposed some advantages of SA over GA [2]. More recently, EA is being administered for lumbar

microdiscectomies. EA may offer potential advantages over SA including the ability to provide analgesia for virtually an unlimited amount of time, more stable intraoperative haemodynamics, decreased postoperative pain scores and analgesic requirements, decreased postoperative nausea and decreased postoperative urinary retention [7]. Hence, it was decided to compare the intraoperative and postoperative variables between epidural and GA in patients undergoing single level lumbar microdiscectomies.

Ulutas M et al., conducted a retrospective analysis of 850 LMD under EA (EA; n=573) or GA (GA; n=277) performed by the same surgeon. It showed that, the TOT was higher (107.6±25.83) in the GA group than (81.84±21.48) in the EA group which was statistically significant thus, leading to increased cost for patients. Duration of operation between GA and EA group did not differ [7]. In another study by Ren Z et al., there was no significant difference between the ST (68.59±16.38 minutes; range, 39-100 minutes) in group GA and group EA (69.07±18.37 minutes; range, 35-120 minutes; p>0.05) [8]. Zhang L et al., compared two hundred patients with disc herniation, who were posted for percutaneous transforaminal endoscopic discectomy under either EA or local infiltration anaesthesia and found that, SOT was longer in the EA group than in the LA group (p<0.001), but there was no significant difference in the total operation time between the two groups [9].

In the present study, TOT (160.75±16.733 in GA versus 140.05±17.916 in EA) was less in the EA group and was highly significant. It may be due in part to the fact that, the patient is not required to recover from a surgical plane of GA for extubation before leaving the operating room [10]. The SOT was also compared and it was significantly more in the EA group when compared to the GA group. But, ST was comparable among patients in both the groups. These findings were consistent with the above studies. In a study by Abdel Hady SMFM et al., 100 patients were compared undergoing primary single level lumbar discectomy under combined caudal epidural with general anaesthesia versus general anaesthesia alone, there was statistically highly significant decrease of MAP and HR in epidural group compared to those in GA group (p-value <0.001) [11]. In accordance with the cited study, the present study data suggested that haemodynamic stability may be better maintained in EA group with lower HR and blood pressures (p-value <0.001) than in patients under GA, possibly due to avoidance of endotracheal instrumentation and inhibited release of stress hormones, glucose, and interleukins intraoperatively [12]. However, in a meta-analysis by Pöpping DM et al., EA significantly increased the risk of arterial hypotension, pruritus, urinary retention, and motor blockade [13]. The authors did not find any untoward side-effects for EA and this may be because of a less sample size.

In the postoperative phase, EA had lower postoperative pain scores, and analgesic requirement [14]. Akakin A et al., showed that, VAS score for pain was dramatically low at the immediate postoperative period (0.78) and decreased to 0.35 after 24 hour of operation [6]. Abdel Hady SMFM et al., showed that, there was statistically highly significant decrease regarding postoperative VAS score in epidural group when compared to group GA (p-value <0.001) [11]. In the present study, the overall VAS scores for pain and total dose of fentanyl used for analgesia were found to be significantly lesser in the EA group, when compared to GA group throughout the study period i.e., 24 hours. Another major advantage of EA apart from excellent postoperative analgesia is reduced nausea and vomiting. In a study conducted by Lakshminarasimhaiah G et al., postoperative nausea was noted in 5% and vomiting was observed in 2.5% of GA with caudal epidural patients. There was no occurrence of PONV in EA patients [15]. In ten studies evaluated by De Cassai A et al., patients undergoing GA were more likely to experience PONV [10]. Administration of GA leads to an increased occurrence of PONV and this can be explained by the inhibition of gastric emptying, at the same time, it can be actually absent with EA. Further, inhalation agents and N_2O use in GA causes increased occurrence of PONV [16]. The findings of the present study were concurrent with the above studies. Three patients had moderate nausea, out of which 2 (10%) were in GA group. One patient from the GA group had severe nausea with vomiting.

Here, in the present study, patient's satisfaction levels were studied with regard to pain relief at the end of the first 24 hours using 4-point Likert scale [17]. Zhang L et al., showed that, postoperative patient's satisfaction was 72% and 100% in the LA and EA groups, respectively (p-value <0.001) [9]. In the present study, 70% of patients from the epidural group were totally satisfied with regard to pain relief at the end of the initial postoperative period (24 hours) compared to 40% in the GA group. However, none of the patients were totally dissatisfied with pain relief in both the groups.

Limitation(s)

The study was conducted on patients, who were operated under EA and it is thus, difficult to run into a conclusion, whether EA has definite advantages over GA in lumbar microdiscectomies.

CONCLUSION(S)

The EA may be used as an alternative to GA in single level lumbar microdiscectomies, as it provides better intraoperative haemodynamics, effective pain relief in the immediate postoperative period, decreased incidence of PONV and greater levels of patient satisfaction with regard to pain relief.

REFERENCES

[1] Malik SH, Saleem H, Ashfaq AD, Malik IH, Batool F, Siddique K. General anaesthesia versus regional anaesthesia for lumbar laminectomy: A review of the modern literature. J Ayub Med Coll Abbottabad. 2020;32(3):400-04.

[2] Pierce JT, Kositratna G, Attiah MA, Kallan MJ, Koenigsberg R, Syre P, et al. Efficiency of spinal anaesthesia versus general anaesthesia for lumbar spinal surgery: A retrospective analysis of 544 patients. Local Reg Anesth. 2017;10:91-98.

[3] Kiran LV, Radhika KS, Parthasarathy S. Lumbar laminectomy with segmental continuous epidural anaesthesia. Anesth Essays Res. 2014;8(2):236-38.

[4] Bos EME, Hollmann MW, Lirk P. Safety and efficacy of epidural analgesia. Curr Opin Anaesthesiol. 2017;30(6):736-42.

[5] Benyahia NM, Verster A, Saldien V, Breebaart M, Sermeus L, Vercauteren M. Regional anaesthesia and postoperative analgesia techniques for spine surgery-a review. Rom J Anaesth Intensive Care. 2015;22:25-33.

[6] Akakin A, Yilmaz B, Akay A. Epidural anaesthesia in elective lumbar microdiscectomy surgery: Is it safe and effective? Turk Neurosurg. 2015;25:117-20.

[7] Ulutaş M, Seçer M, Taskapilioglu O, Karadas S, Akyılmaz A, Baydilek Y, et al. General versus epidural anaesthesia for lumbar microdiscectomy. Journal of Clinical Neuroscience. 2015;22:1309-13.

[8] Ren Z, He S, Li J, Wang Y, Lai J, Sun Z, et al. Comparison of the safety and effectiveness of percutaneous endoscopic lumbar discectomy for treating lumbar disc herniation under epidural anaesthesia and general anaesthesia. Neurospine. 2020;17(1):254-59.

[9] Zhang L, Chang T, Xu Y, Jing Q, Zhao X, Li C. Epidural anaesthesia with low concentration ropivacaine and sufentanil for percutaneous transforaminal endoscopic discectomy: A randomized controlled trial. Front Med. 2020;7:362.

[10] De Cassai A, Geraldini F, Boscolo A, Pasin L, Pettenuzzo T, Persona P, et al. General anaesthesia compared to spinal anaesthesia for patients undergoing lumbar vertebral surgery: A meta-analysis of randomized controlled trials. J Clin Med. 2020;10(1):102.

[11] Abdel Hady SMFM, Ahmed AYI, Allah HSAHN, Basta MRZ, Fawal SMME. Combined caudal epidural with general anaesthesia for lumbar discectomy. Ain Shams Medical Journal. 2022;73(3):695-703.

[12] Mergeay M, Verster A, Van Aken D. Regional versus general anaesthesia for spine surgery. A comprehensive review. Acta Anaesthesiol Belg. 2015;66:01-09.

[13] Pöpping DM, Elia N, Van Aken HK, Marret E, Schug SA, Kranke P, et al. Impact of epidural analgesia on mortality and morbidity after surgery: Systematic review and meta analysis of randomized controlled trials. Annals of Surgery. 2014;259(6):1056-67.

[14] Sun J, Fang C, Gao F, Wei L, Qian J. Comparison of effectiveness and safety between epidural anaesthesia versus local anaesthesia for percutaneous transforaminal endoscopic discectomy. Medicine. 2020;99(1):e18629.

[15] Lakshminarasimhaiah G, Madabhushi R, Pai KR. Comparison of epidural anaesthesia and general anaesthesia with caudal epidural analgesia for minimally invasive lumbosacral spine surgeries. Int J Anesth Pain Med. 2018;4(1):01-03.

[16] Czarnetzki C, Elia N, Frossard JL. Erythromycin for gastric emptying in patients undergoing general anaesthesia for emergency surgery: A randomized clinical trial. JAMA Surg. 2015;150:730-37.

[17] Chyung SY, Roberts K, Swanson I, Hankinson A. Evidence-based survey design: the use of a midpoint on the likert scale. Performance Improvement. 2017;56(10):15-23.

PARTICULARS OF CONTRIBUTORS:
1. Assistant Professor, Department of Anaesthesia, Believers Medical College, Pathanamthitta, Kerala, India.
2. Associate Professor, Department of Anaesthesia, Believers Medical College, Pathanamthitta, Kerala, India.
3. Professor, Department of Anaesthesia, Believers Medical College, Pathanamthitta, Kerala, India.
4. Associate Professor, Department of Anaesthesia, Believers Medical College, Pathanamthitta, Kerala, India.
5. Professor and Head, Department of Anaesthesia, KVG Medical College and Hospital, Mangalore, Karnataka, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Anita Mathew,
Noel Cassatiearra, Tiruvalla, Pathanamthitta, Kerala, India.
E-mail: dranitageomcy@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Sep 23, 2022
- Manual Googling: Dec 24, 2022
- iThenticate Software: Jan 07, 2023 (25%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **Sep 21, 2022**
Date of Peer Review: **Dec 05, 2022**
Date of Acceptance: **Jan 09, 2023**
Date of Publishing: **Jun 01, 2023**