Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i5.6351

COMBINED SPINAL EPIDURAL FOR POST OPERATIVE ANAESTHESIA OF PATIENTS UNDERGOING ABDOMINAL HYSTERECTOMY: AN OBSERVATIONAL STUDY

Dr. Sujeela Waheed[1], Dr. Sayema Javed Rana[2], Dr. Tantry Tariq Gani[3*]

[1]Postgraduate Scholar, Department of Anesthesiology & Critical Care, Government Medical College, Srinagar, India.
[2]Postgraduate Scholar, Department of Anesthesiology & Critical Care, Government Medical College, Srinagar, India.
[3*]Lecturer Department of Anesthesiology & Critical Care, Government Medical College, Srinagar, India.

***Corresponding Author:** Dr. Tantry Tariq Gani
*Lecturer, Department of Anesthesiology & Critical Care, Government Medical College, Srinagar, India.

Abstract:

Background: Postoperative pain management is a matter of concern for every anaesthesiologist. Effective pain management is now an integral part of modern surgical practice. Despite recognition of the importance of effective pain control, up to 70% of patients still complain of moderate to severe pain postoperatively.

Aim: The aim of the study was to assess the efficacy and safety of CSE Anaesthesia compared to spinal anaesthesia in patients undergoing hysterectomy.

METHODS: Sixty female patients scheduled for an elective total abdominal hysterectomy were prospectively randomized in to two groups, Group A (n = 30) received 0.2% Ropivacaine bolus dose through epidural at the time of shifting to post operative ward and Group B (n = 30) received i.v analgesics in the form of paracetamol and tramadal. Data collected on a predesigned data collection sheet included patient's demographics, postoperative analgesia modality, patient satisfaction, acute pain service assessment of visual analog scale (VAS), number of breakthrough pains, number of rescue boluses, time required for the pain relief after rescue analgesia, and any complication for 48 h.

RESULTS: Low VAS scores were observed in the epidural Group at all times compared with the Group B ($P< 0.05$) except at 24 hrs where the difference was not significant ($P=0.124$). Time to recue analgesic was longer in Group A compared to Group B, the difference was statistically significant ($P=0.003$).Total rescue analgesia consumption was lowest in Group A than Group B , the difference was statistically significant.($P < 0.05$). Postoperative side effects like nausea, vomiting, pruritis, hypotension were seen in both groups however the difference was statistically not significant ($P>0.05$).

CONCLSIONS: The effect of anesthetic and postoperative analgesic techniques on perioperative outcome varies with the type of operation performed. Overall, epidural analgesia provides better postoperative pain relief. Epidural anesthesia and epidural analgesia improve the overall outcome and shorten the hospital stay time in patients undergoing abdominal hysterectomy.

Keywords: Abdominal Hysterectomy, Epidural Anesthesia, Spinal Anaesthesia, Postoperative Pain, VAS, Ropivacaine.

INTRODUCTION:

Hysterectomy consists of surgical removal of the uterus and, following C-section, it is the second most common surgery performed in female patients. This surgery is associated with a high emotional burden related to fertility, sexuality, and femininity, and can elicit strong physical, psychological, and social changes.[1] Although surgical procedures focus on the improvement of health and feeling of well-being, they can also engender enough discomfort and emotional fragility to lead to the perception of decreased quality of life, even in the absence of specific complications.[2] Frequently, a poor post-operative recovery period can lead to prolonged length of stay, increasing hospital costs and diminishing patient satisfaction. [3,4] Thus, the multidisciplinary team should seek techniques that offer patients fast recovery and expeditious return to daily activities.[5] Most studies assessing the quality of post anesthetic and surgical recovery, most of the time analyze elements such as recovery time, cardio respiratory complications, pain, Postoperative Nausea and Vomiting (PONV), length of stay or other complications.[6] When they are considered alone, these aspects do not necessarily mirror the recovery of most patients undergoing anesthesia and surgery. Therefore, quality-of-life assessment from the patient's point of view has become an important factor to be considered in studies investigating the anesthesia and surgery effect on patient recovery and satisfaction.

Patients undergoing major surgical operations continue to experience pain with an overall reported incidence of 29.7% for moderate-to-severe pain and 10.9% for severe pain. [7] Even in developed countries, 86% of patients experience postsurgical pain and 75% of those who reported pain described its severity as moderate-to-severe during the immediate postoperative period.[8]

Combined spinal epidural technique was described for the first time by "Soresi." [9] Combined spinal epidural anaesthesia is like "to paint the fence" from both sides.[10] The block in SCSE results from a relatively small amount of the spinal local anaesthetic followed by the epidural drug. [11]

In SCSE, low dose of spinal intended to be inadequate for surgery is used in an attempt to reduce hypotension and the block is then deliberately extended cephalad with epidural drug. This technique is becoming very popular in elderly high risk patients and in patients with compromised cardiopulmonary reserve. [12,13]

Epidural volume extension (EVE) has been shown to increase the upward spread of the block due to "volume effect" [14] and this may be achieved by injection of saline or local anaesthetic agent in the epidural space.

Methods:

This prospective observational study was conducted for a period of one year. The inclusion criteria for the study included female patients belonging to the American Society of Anesthesiologists (ASA) physical Class I and II status, undergoing elective total abdominal hysterectomy surgery under spinal anesthesia. The exclusion criteria included patients not consenting to be a part of the study, undergoing emergency surgery, having chronic pain conditions or on pain medications and psychiatric problems. Patients fulfilling our inclusion criteria were approached for written informed consent. Those patients consenting to be a part of the study were enrolled and were briefed about the pain assessment involving verbal VAS assessment and satisfaction scoring with pain management strategies.

Sixty female patients scheduled for an elective total abdominal hysterectomy were prospectively randomized in to two groups, Group A (n = 30) received 0.2% Ropivacaine bolus dose through epidural at the time of shifting to post operative ward and Group B (n = 30) received i.v analgesics in the form of paracetamol and tramadal.

Anaesthesia technique:
Under all aseptic precautions with the patient in sitting position, the skin over the 3rd or 2nd lumbar interspace was infiltrated with 1% lignocaine and the extradural pace located with 16-gauge Tuohy needle using midline loss of resistance to saline injection. 16-gauge epidural catheter was inserted 3 cm in cephalad direction and then taped to the skin. After negative aspiration of blood and CSF, a test dose of 3 ml of 2% lignocaine with adrenaline (1:200000) was injected. Subarachnoid block was performed at $L_{3–4}$ level with 25-gauge Quincke spinal needle with 3cc of 0.5% bupivacaine heavy. The patient was made to lie down supine immediately after the block. The anesthesiologist who is performing the block will record the intraoperative data (pulse rate, blood pressure, and oxygen saturation). Oxygen through nasal prongs at 2 L/min was kept for all the patients.
Information was entered in a predesigned data collection sheet which included patient's medical record number, demographics, ASA grading, type of surgery and surgical duration, postoperative pain management modality details, use of co-analgesia, VAS assessment in the post anesthesia care unit (PACU) at 30 and 60 min and then at 4, 8, 12, 24, and 48 h postoperatively. In addition, any incident
of breakthrough pain with VAS ≥4 at any time for 48 h and complications like sedation, cardiovascular instability, nausea, vomiting. The type, number of rescue boluses, and time required for the pain relief were also noted down. All the assessment was done in PACU at 30 and 60 min and in the ward at 4, 8, 12, 24, and 48 h postoperatively. Pain was assessed using the VAS of 0–10, where 0 is no pain and 10 represents worst pain imaginable. Patients were asked to rate their satisfaction with pain management as excellent, good, fair, or poor. All patients were followed for the study till 48 h postoperatively.

Statistical analysis
Statistical analysis was performed using the Statistical Packages for Social Science version 19 (SPSS Inc., Chicago, IL, USA). Mean and standard deviation were estimated for numeric characteristics of patients. Frequency and percentage were computed for anesthetic characteristics, and co-analgesia requirement, satisfaction of patients regarding postoperative pain management, and complication of patients. Chi-square test was applied to compare pain intensity, complication, and patient experience regarding postoperative pain management among analgesic techniques. $P \leq 0.05$ was considered as significant.

Conflict of interest: Nil

Funding: Nil

Results:
There were no significant differences between groups for patient characteristics with regard to demographics [Table 1].

Table 1: Demographic profile among the study population

Variables	Group A	Group B	P value
Age (Years)	**45.3±10.33**	**46.4±11.13**	**>0.05**
Weight (kg)	**58.21±9.34**	**59.31±10.51**	**>0.5**
ASA I/II	**21/9**	**20/10**	**>0.05**

In Group A, the number of patients who achieved T6 were 50% and in Group B it was 23.33%, ($p<0.05$) was statistically significant. In Group A the number of patients which achieved T8 were 26.66% and in Group B it was 30%, ($p>0.05$). In Group A the number of patients with T10 were 23.33% and 46.66% in Group B. ($p<0.05$) [Table 2].

Table 2: Shows the distribution of cases according to maximum sensory level achieved.

Maximum sensory level achieved.	Group A		Group B		P value
T6	15	50%	7	23.33%	0.006
T8	8	26.66%	9	30%	0.784
T10	7	23.33	14	46.66%	0.014
Total	30	100%		100%	

The baseline mean pulse in group B was 82.50±5.71 beats / min (bpm) and in Group B was 82.21±4.25 bpm.($p>0.05$) During intraoperative period in Group A it was from 83.80±5.67 to 87.70±7.3 (bpm) and in Group B it was from 80.40±4.01 bpm to 85.40±2.19 bpm. From 2 minutes to 20 minutes, there was rise in pulse rate in Group A. ($p<0.05$) [Table 3].

Table 3: Shows distribution of cases as per pulse rate changes

Pulse rate	(Group A) Mean±SD	(Group B) Mean±SD	P Value
0 min	82.50±5.71	82.21±4.25	0.821
2 min	84.11±5.73	80.34±4.02	0.005
4 min	85.66±6.11	81.16±3.78	0.001
6 min	85.95±5.84	82.31±3.89	0.006
8 min	87.61±5.82	84.09±2.89	0.005
10 min	87.70±7.32	83.34±2.78	0.003
15 min	86.78±7.61	83.01±2.74	0.016
20 min	86.27±6.72	83.67±2.04	0.051
25 min	85.98±8.98	84.82±2.48	0.514
30 min	83.81±5.67	85.22±3.05	0.237
45 min	85.98±6.63	85.19±3.02	0.611
60 min	85.15±6.23	88.66±2.68	0.754
75 min	86.16±8.89	85.21±1.87	0.578
90 min	87.22±7.26	85.38±2.21	0.191
105 min	87.15±7.64	84.89±2.67	0.321
120 min	87.68±6.68	85.14±2.14	0.054

The baseline mean blood pressure was 92.50±4.99 mmHg in Group A and 95.10±5.52 mmHg for Group B. Intraoperatively it was between 77.70±2.31mmHg and 99.69±4.51mm Hg in Group A and in Group B it was 85.22±3.81mmHg and 100.74±2.47mmHg. From 2 min to 60 min there was decrease in MBP in group A in comparison to group B. After 60 min both the groups were comparable ($P>0.05$) [Table 4].

Table 4: The mean blood pressure (MBP) among the study population

MBP	(Group A) Mean±SD	(Group B) Mean±SD	P Value
0 min	92.51±	95.10±	0.071
2 min	78.39±	85.23±	0.001
4 min	77.70±	85.59±	0.001
6 min	78.70±	86.85±	0.001
8 min	78.32±	88.15±	0.000
10 min	78.51±	90.68±	0.001
15 min	79.86±	91.89±	0.001
20 min	80.97±	93.34±	0.001
25 min	84.74±	94.32±	0.000
30 min	88.29±	96.54±	0.001
45 min	91.67±	98.40±	0.000
60 min	94.16±	99.89±	0.003
75 min	96.55±	98.65±	0.687
90 min	98.15±	100.87±	0.389
105 min	99.13±	100.65±	0.124
120 min	99.67±	100.74±	0.286

Time to first rescue analgesic was 978.87 ± 148.6 min in Group-A and was 201.45 ± 38.09 min in Group-B which was statistically significant with *P* value < 0.0001. The mean duration of analgesia in Group-A was 924 ± 118.38 min, which is statistically highly significant with *P* value < 0.0001 than Group-B in which it was 210 ±29.87 min. Total consumption of analgesia in 48h was 46±31 mg in Group-A and was 172±71mg Group-B, which was statistically significant with *P* value < 0.0001. The mean duration of motor block in Group-A was 458 ± 30.9 min with *P* value of < 0.0001 which is statistically highly significant when compared to Group-B in which it was 118.37 ± 13.28 min [Fig 1].

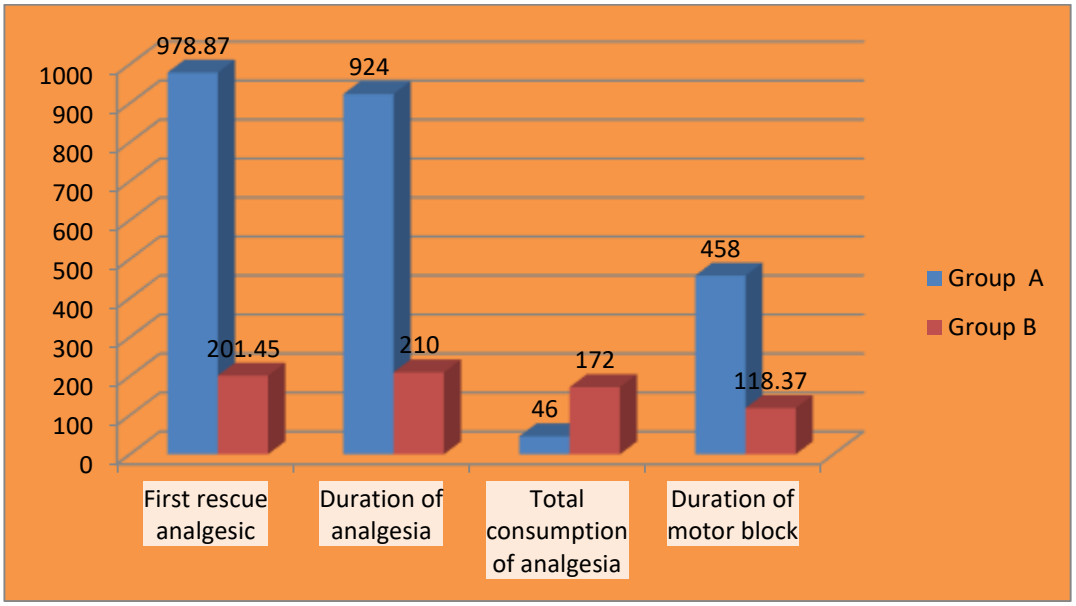

Fig 1.

Visual analogue scale at different time intervals were statistically significantly lower at all times in Group A than Group B p-value (p<0.05) [Fig 2].

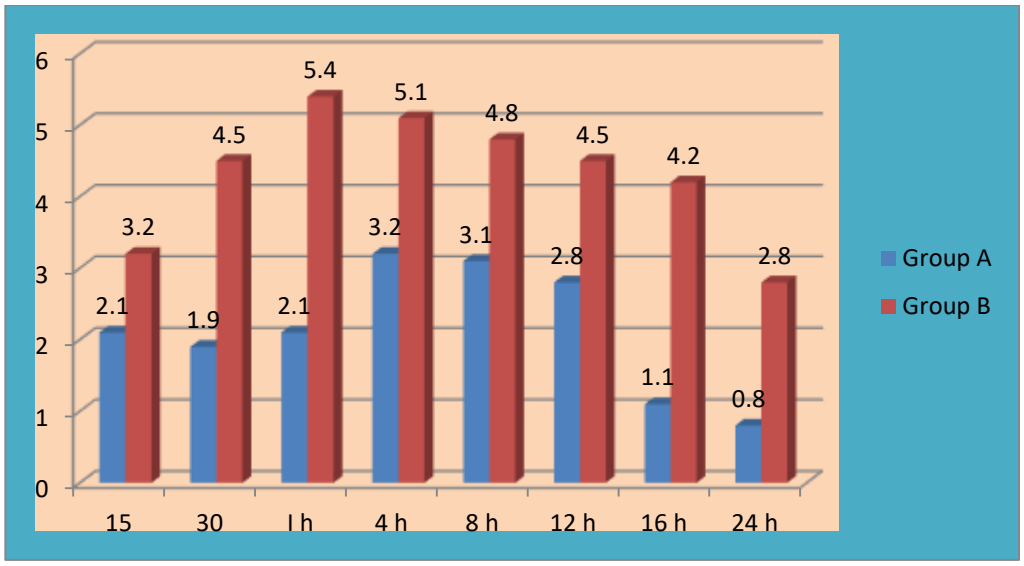

Fig 2.

With regard to the post operative adverse effects observed among the two study groups. When compared statistically, the results were found not significant with a p value of >0.05 [Fig 3].

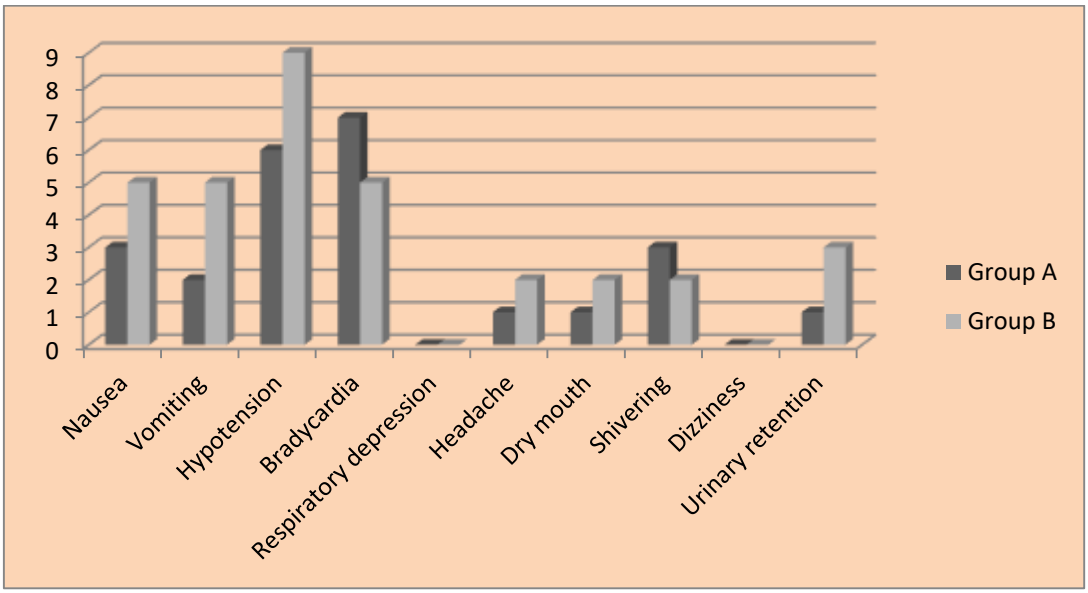

Fig 3

Discussion:

The newly emerging concept of sequential combined spinal epidural technique is in vogue. In this technique, a low dose of local anaesthetic drug is injected in the intrathecal space in an attempt to reduce the chances of hypotension and at the same time achieve early onset of anaesthesia and then the block is deliberately extended cephalad with the epidural drug. This technique is becoming increasingly popular in modern obstetric practice because of various claimed benefits mainly stable haemodynamic status. The sequential CSEA is now being used in elderly high risk patients for orthopaedic surgery with encouraging results.[15] The SCSE technique combines the distinct benefits of both, the rapid, dense and reliable block of spinal with the flexibility of continuous epidural block to extend duration of analgesia. [11]

The aim of postoperative analgesia is to provide subjective comfort with minimum side effects, and to blunt autonomic and somatic reflex responses to pain, to allow early ambulation and restoration of function.

The challenge of modern anaesthesia and perioperative medicine is to create efficient treatment regimens with an optimal balance between protective and unwanted effects, in order to ensure patient safety and comfort, and to facilitate recovery. The main problems of abdominal hysterectomy in the immediate perioperative period are pain, PONV, and gastrointestinal paralysis, which may postpone recovery and discharge from hospital. The optimal anaesthetic regimen for this procedure should carry a low risk, along with effective pain relief and minimal, if not protective, effects on the gastrointestinal dysfunction and PONV induced by surgery. Hence, anaesthetics and analgesics, which produce effective analgesia with a low potential for gastrointestinal side effects, should be advantageous. [16]

Previous studies, in patients undergoing abdominal hysterectomy [17] and colonic surgery,[18-20] have shown that an epidural regimen with LA reduces postoperative pain compared with regimens based on systemic opioids. The present study confirms these results. A longitudinal analysis of variance components, with pain score as the dependent variable, was performed in this study.

A large number of patients experienced moderate to severe pain after open hysterectomy, and pain scores of 40-60 mm on a 100-mm VAS scale are not unusual. Furthermore hysterectomy is often associated with considerable nausea and vomiting.[21] Postoperative gastrointestinal paralysis may last for 2-5 days, depending on the technique provided for anaesthesia and postoperative analgesia.[20, 22] In the present study conducted in our department 60 patients undergoing open hysterectomy under spinal anaesthesia with 0.2% ropivacaine in epidural group and in another group of patient's only spinal anaesthesia was given, followed by postoperative pain treatment with

paracetamol and tramadol. Epidural analgesia with local anaesthetics after lower abdominal surgery is a powerful method of relieving postoperative pain, provided that the catheter is placed at the correct dermatome." [23] In addition, epidural local anaesthetics may reduce gastrointestinal paralysis and postoperative nausea and vomiting by inhibition of visceral reflex activity and reduced need for perioperative opioids. [24]

The effect of continuous epidural infusion with ropivacaine on postoperative pain, analgesic requirements and motor function has been investigated in several studies. [25-27] A dose-finding study with 0.1%. 0.2% and 0.3% ropivacaine by Scott and colleagues in patients undergoing lower abdominal surgery demonstrated that 0.2% ropivacaine 10 ml h-l provided the best balance between analgesia and motor block. [28] In another study, Etches and colleagues investigated the effect of epidural 0.2% ropivacaine at a rate of 6. 8, 10, 12 or 14 ml h^{-l} after lower abdominal surgery. They found that ropivacaine 10-14 ml h^{-1} (but not 6 or 8 ml h-') reduced PCA morphine requirements but had little effect on pain scores. Significant motor block was observed in at least 30% of patients receiving ropivacaine 8-14 ml h^{-1}. [29]

CONCLSIONS:

The effect of anesthetic and postoperative analgesic techniques on perioperative outcome varies with the type of operation performed. Overall, epidural analgesia provides better postoperative pain relief. Epidural anesthesia and epidural analgesia improve the overall outcome and shorten the hospital stay time in patients undergoing abdominal hysterectomy with lesser side effects.

References:

1. Melo MCB, Barros ÉND. Histerectomia e simbolismo do útero:possíveis repercussões na sexualidade feminina. Rev SBPH.2009;12:80---99.
2. Lee WK, Kim MS, Kang SW, Kim MS, Lee JR. Type of anaesthesiaand patient quality of recovery: a randomized trial compar-ing propofol-remifentanil total i.v. anaesthesia with desfluraneanaesthesia. Br J Anaesth. 2015;114:663---8.
3. Poitras S, Beaule P, Dervin GF. Validity of a short-term qualityof life questionnaire in patients undergoing joint replacement:the Quality of Recovery-40. J Arthroplasty. 2012;27:1604---8.
4. Kluivers KB, Riphagen I, Vierhout ME, Brölmann HA, de Vet HC.Systematic review on recovery specific quality-of-life instru-ments. Surgery. 2008;143:206---15.
5. Murphy GS, Szokol J, Greenberg SB, et al. Preoperative dex-amethasone enhances quality of recovery after laparoscopiccholecystectomy: effect on in-hospital and postdischarge recov-ery. Anesthesiology. 2011;114:882---90.
6. Estivalet FF, Bagatini A, Gomes CR. Remifentanil associated topropofol or sevoflurane for videolaparoscopic cholecystectomy:a comparative study. Rev Bras Anestesiol. 2002;52:385---93.
7. Dolin SJ, Cashman JN, Bland JM. Effectiveness of acute postoperative pain management: I. Evidence from published data. Br J Anaesth 2002;89:409-23.
8. Gan TJ, Habib AS, Miller TE, White W, Apfelbaum JL. Incidence, patient satisfaction, and perceptions of post-surgical pain: Results from a US national survey. Curr Med Res Opin 2014;30:149-60.
9. Cook TM. Combined spinal-epidural techniques. *Anaesth* 2000;55:42-64.
10. Eldor J. Combined spinal epidural general anaesthesia. *Reg Anaesth* 1994;19:365-366.
11. Rajan S, Seetharaman M, Nair SG. Comparison of efficacy and safety of sequential combined spinal epidural anaesthesia versus spinal anaesthesia in high risk geriatric patients. *Amrita J Anaesth* 2014;1-44.
12. Fan S-Z,Susetio I, Wan Gyp, Low dose of intrathecal hyperbaric bupivacaine combined with epidural lidocaine for caesarean section – a balance block technique. *Anaesth Analg* 1994;78:474-477.

13. Hamdani GA, Chohan U, Zubair NA. Clinical usefulness of sequential combined spinal epidural anaesthesia in high risk geriatric patients for major orthopaedic surgery. *J Anesth Clin Pharmacol* 2002;18(2):163.
14. Blumgart CH, Ryall D, Dennison B, Thompson Hill LM. Mechanism of extension of spinal anaesthesia by extradural injection of local anaesthetic. *Br J Anaesth* 1992;69:457-460.
15. Bhattacharya D, Tewari I, Chowdhuri S. Comparative study of sequential combined spinal epidural anaesthesia versus spinal anaesthesia in high risk geriatric patients for major orthopaedic surgery. *Indian J Anaesth* 2007;51(1):32-36.
16. Mercadante S, Villari P, Casuccio A, Marrazzo A. A randomized-controlled study of intrathecal versus epidural thoracic analgesia in patients undergoing abdominal cancer surgery. Journal of clinical monitoring and computing. 2008;22(4):293-8.
17. Glise H. Abrahamsson H. Spino-vagal nonadrenergic inhibition of gastric motility elicited by abdominal nociceptive stimulation in the cat. ScandJ Gostroenterol 1980; **15:** 665-72.
18. Mclndoe AK, Warwick P. O'Connor M. A comparison of retrospective versus contemporaneous nausea scores with patientcontrolled analgesia (see comments). Anaesthesia 1996; **5 I** : 333-7.
19. Warriner CB, Knox D, Belo S, Cole C, Finegan BA, Perreault I. Prophylactic oral dolasetron mesylate reduces nausea and vomiting after abdominal hysterectomy. The Canadian Dolasetron Study Group. Con *J* Anaesth 1997; **44:** I 167-73.
20. Asantila R, Eklund P, Rosenberg PH. Continuous epidural infusion of bupivacaine and morphine for postoperative analgesia after hysterectomy. Acta Anaesthesiol Scond I99 I ; **35:** 5 13-1 7.
21. Cruickshank RH, Spencer A, Ellis FR. Pretreatment with controlledrelease morphine for pain after hysterectomy. Anaesthesia 1996;51:1091.101.
22. Thorn SE, Wattwil M. Naslund I. Postoperative epidural morphine, but not epidural bupivacaine, delays gastric emptying on the first day after cholecystectomy. Reg Anesth 1992; **I 7:** 9 I.
23. Scheinin B, Asantila R, Orko R. The effect of bupivacaine and morphine on pain and bowel function after colonic surgery. Acto Anoesthesiol Scand 1987; **3** I : I ***6*** 1-4.
24. Scott DA, Chamley DM, Mooney PH, Deam RK, Mark AH, Hagglof B. Epidural ropivacaine infusion for postoperative analgesia after major lower abdominal surgery-a dose finding study. Anesth Anolg 1995; **8 I** : 982-6.
25. Schug SA, Scott DA. Payne J, Mooney PH. Hagglof **B.** Postoperative analgesia by continuous extradural infusion of ropivacaine after upper abdominal surgery. Br *J* Anaesth 1996; **76:** 487-9 I.
26. Badner NH. Reid D, Sullivan P, et *ol.* Continuous epidural infusion of ropivacaine for the prevention of postoperative pain after major orthopaedic surgery: a dose-finding study. Con *J* Anaesth 1995; **8 I** : 982-6.
27. Turner G, Blake D, Buckland M, et ol. Continuous extradural infusion of ropivacaine for prevention of postoperative pain after major orthopaedic surgery. Br *j* Anoesth 1996; **76:** 606-1 0
28. Scott DA, Emanuelsson BM, Mooney PH, Cook RJ, Junestrand C. Pharmacokinetics and efficacy of long-term epidural ropivacaine infusion for postoperative analgesia (in process citation). Anesth Anolg 1997; **85:** 1322-30.
29. Etches RC. Writer WD, Ansley D, et *al.* Continuous epiduralropivacaine 0.2% for analgesia after lower abdominal surgery. Anesth Anolg 1997; **84:** 784-90.