COMBINED SPINAL AND EPIDURAL ANAESTHESIA FOR ABDOMINAL SURGERY: A NEW TECHNIQUE

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ABSTRACT

Combined spinal and epidural anaesthesia was used in 50 patients undergoing abdominal surgery. A fixed dose of 1.0 mL of 5 per cent lignocaine was injected intrathecally in all cases followed by 10 mL of 0.5 per cent bupivacaine epidurally, using "needle through needle" technique in the same lumbar intervertebral space. Subsequently epidural catheter was passed for top-up doses and postoperative analgesia. The advantages of this technique observed were immediate onset of intense block of prolonged, controllable duration and no incidence of post-spinal headache. Five cases developed intraoperative hypotension which required correction. No patient developed any complications of spinal and epidural anaesthesia.

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KEY WORDS : Anaesthesia epidural; Anaesthesia spinal.

Introduction

Combined spinal and epidural anaesthesia was introduced by Brownridge [1] in 1981 using two different spaces for epidural and subarachnoid block. The technique was later modified by Coats [2] and Mumtaz et al [3]. They described the "needle through needle" technique in which a 16 gauge epidural needle served as an introducer for a 25 or 26 gauge spinal needle. Since then many reports have come favouring one technique over the other. We used "needle through needle" technique using the same vertebral interspace. The technique provides the anaesthesiologist with versatility and effectiveness of spinal anaesthesia with the variability of the epidural anaesthesia. The study was carried out with the aim to investigate the safety, effectiveness, and advantages of the technique.

Material and Methods

A pilot study was first carried out on 10 adult patients consisting of randomly selected 5 males and 5 females in ASA grade-I, to test the technique and ascertain the volume of 0.5 per cent bupivacaine required epidurally to achieve a block till T5 level. A kit consisting of one epidural nee-

dle 16 gauge, one epidural catheter 18 gauge, and one spinal needle 26 gauge was used. Patients were placed in lateral position and spaces L2-3 or L3-4 were selected on anatomical suitability. Epidural needle 16 gauge was inserted first to reach epidural space through which a spinal needle 26 gauge was introduced and advanced intrathecally. One mL of 5 per cent lignocaine was then instilled intrathecally. Later epidural catheter 18 gauge was placed through epidural needle in the epidural space and 6.0 mL of 0.5 per cent bupivacaine was instilled. The level of block was tested by pin pricks after 10 minutes and additional 2.0 mL of solution was instilled in epidural space every 10 minutes till the block up to T5 level was achieved. The volume of 0.5 per cent bupivacaine solution so ascertained was 10.0 ± 2.0 mL.

Thereafter 50 adult patients in ASA grade I and II consisting of abdominal hysterectomy - 28 cases, cholecystectomy - 6 cases, tuboplasty - 5 cases, ovarian tumour removal - 4 cases, hernia repair - 2 cases and colorectal surgery - 5 cases were selected for study. Age and sex distribution are shown in Table 1.

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TABLE 1
Age and sex distribution in patients under study

Age	Sex	Number
21 to 30 years	Male	2
	Female	5
31 to 40 years	Male	—
	Female	10
41 to 50 years	Male	—
	Female	14
51 to 60 years	Male	5
	Female	14
Total		50

All cases were premedicated with tab diazepam 5 mg night before and 5 mg one and half hours before surgery. Preloading with 15 mL/kg Ringer lactate over 30 minutes was done. Patients were administered 1.0 mL of 5 per cent lignocaine intrathecally and 10.0 mL of 0.5 per cent bupivacaine solution epidurally through the epidural catheter using the method and technique as described above. After interval of 10 minutes additional 2.0 mL of 0.5 per cent bupivacaine was administered epidurally if the level of block did not reach T5 segment. Top-up doses of 2.0 mL of 0.5 per cent bupivacaine were given in epidural space as required whenever surgery was prolonged.

Continuous intraarterial BP, pulse oximetry and ECG monitoring were done in all cases. The parameters recorded were: Time of onset of block up to T5, duration of effect and top-up dose if any, occurrence of hypotension, bradycardia, accidental total spinal anaesthesia, post-spinal headache or any other complication.

Results

The onset of block was almost immediate and patients were ready for surgery by the time of skin preparation and draping. The level of block was found to reach T5 segment and stabilize in 8 to 10 minutes. The muscle relaxation was assessed by surgeons and graded as excellent, good, fair and poor. It was found to be excellent in all cases. Duration of block varied from 80 to 100 minutes. Only 5 cases required single top-up dose of 2.0 mL of 0.5 per cent bupivacaine. None of the patients had any accidental dural puncture leading to total spinal anaesthesia with epidural needle or catheter.

Five patients had hypotension with systolic arterial blood pressure of less than 90 mmHg. Two of them responded with additional 500 mL of Ringer lactate and 3 were given 5+5 mg of mephentermine. All responded well. No case developed any post-spinal headache or any other complication of spinal epidural anaesthesia.

Discussion

Epidural and spinal blocks are major regional anaesthesia techniques. However both have suffered ups and downs due to their inherent shortcomings. Spinal anaesthesia suffers from the unpredictability of level and duration of block, hypotension and post-dural-puncture headache. Similarly epidural block requires high degree of expertise, has slow onset of action, poor muscle relaxation and inadequate analgesia particularly sacral-segment sparing effect.

Combined spinal epidural is emerging as a reliable, efficient and useful tool in the armamentarium of anaesthesiologists. The technique has been shown to be superior in orthopaedic surgery of pelvis and lower limbs, Caesarean section and analgesia in labour [2,4,5]. We have used the technique with good effect in all types of surgery and more so in abdominal surgery. The reduction of subarachnoid dose of 5 per cent lignocaine to only 50 mg (1.0 mL) and 0.5 per cent bupivacaine to 50 mg (10 mL) in epidural space reduces the toxicity to a great extent. The epidural catheter permits repeated top-up doses for prolonged surgery or post-operative analgesia. Its immediate effect with very good muscle relaxation, combined with totality of analgesia and unrestricted time was openly appreciated by the surgical colleagues in our study. Incidence of hypotension was more than in epidural but almost same as spinal alone. This is due to extension of spinal to higher segments [6]. There was no post-spinal headache in any case as we used a fine 26 gauge spinal needle. The anaesthesia level was higher in our patients due to delivery of two drugs simultaneously leading to higher spread.

We conclude that combined spinal and epidural anaesthesia combines the versatility of spinal with flexibility of epidural and is a very useful and safe technique in expert hands.

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