นิพนธ์ต้นฉบับ

Spinal anesthesia with 0.5% bupivacaine

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การใช้ bupivacaine (marcaine) สำหรับ spinal anesthesia ได้รายงานเป็นครั้งแรกโดย Ekblom และ Widman ในปี 1966 ซึ่งสามารถใช้ได้ดีในการผ่าตัดเกี่ยวกับช่องท้องส่วนล่าง และการผ่าตัดบริเวณขา พบว่า bupivacaine สามารถออกฤทธิ์ได้ยาวนานกว่า โดยที่มีผลแทรกซ้อนเกิดขึ้นน้อยมาก จากการศึกษาในครั้งนี้ ได้ทำ spinal anesthesia ด้วย 0.5% bupivacaine ในผู้ป่วย 80 ราย พบว่าระยะออกฤทธิ์ของ sensory block และ motor block กินเวลาเพียง 3.0 ± 1.6 นาที และ 2.5 ± 1.5 นาที โดยมีฤทธิ์อยู่นานถึง 151.3 ± 60.0 นาที สำหรับ sensory loss และ 222.9 ± 87.7 นาที สำหรับ motor block โดยที่ไม่มีผลแทรกซ้อนที่รุนแรงเกิดขึ้นเลย ได้ผลเป็นที่พอใจของศัลยแพทย์ถึง 93% bupivacaine จึงเป็นยาชาที่เหมาะสำหรับการทำ spinal anesthesia เพื่อการทำผ่าตัดที่ยาวนานโดยไม่ต้องกังวลว่ายาจะหมดฤทธิ์ไปก่อน และผู้ป่วยจะไม่รู้สึกเจ็บหลังการผ่าตัดอีกด้วย ทำให้การใช้ยาระงับปวดลดน้อยลง

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One of the objectives of research involving local anesthetics for regional anesthesia is the prolongation of the duration of anesthesia without an increase in adverse effect or toxicity. Bupivacaine (marcaine) has been found to be an ideal local anesthetics. Spinal anesthesia with bupivacaine is reportedly efficacious and safe[1,2,3] and may be of longer duration than xylocaine.

The purpose of our study was to observe the clinical effects of bupivacaine 0.5 % used in spinal anesthesia.

Methods

Eighty patients with a physical status I with no systemic disease, undergoing lower abdominal or orthopedic surgery were studied by using spinal anesthesia with 0.5% bupivacaine 15 mg. or 20 mg. according to the weight, height and surgical procedures. Each had an IV infusion started with an 16 or 18 gauge plastic catheter, blood pressure and heart rate were recorded before and after the block. Standard lumbar spinal block was administered with a 22 gauge spinal needle. Observation were made on the onset of sensory and motor blockade, duration of block, maximal level of sensory loss, blood pressure, pulse rate, acceptance by the surgeon and the complications. Onset of sensory loss was defined as loss of sensation to pinprick at level of T_{10}. Motor blockade was arbitrarily defined as the inability to raise the heels off the operating table when keeping the legs straight. Duration of block was the duration from the onset of anesthesia to the time sensation returned to T_{10} and the heels could be raised. Anesthesia was rated as satisfactory, fair or poor by the surgeon.

Results

(Table 1) Eighty patients 33 males, 47 females were between 17–75 years of age (33.3 ± 14.0), weight between 35–72 kgs. (51.4 ± 8.2) between 140–170 cms. in height (157.7 ± 7.5). Fifty patients had appendectomy, 22 cases had gynecological procedures and 8 cases had orthopedic procedures. (Table 2)

The dosage of 0.5 % bupivacaine was 15 mg. in 40 patients and 20 mg. in 40 patients according to the extense of surgery. The onset of sensory block was 3.0 ± 1.6 mins and 2.5 ± 1.5 mins for motor block with the highest level of block at T_1–T_{10} and were not related to the height of patients (Table 3). Duration of sensory loss was 151.3 ± 60.0 mins and 222.9 ± 87.7 mins for motor blockade (Table 4). There was no significant change in blood pressure and pulse rate during and after spinal anesthesia (Table 5). The total amount of fluid replacement was 884 ± 302 ml. The results were satisfactory in 69 patients (86.3 %) fair 6 patients (7.5 %) and poor 5 patients (6.2 %) who needed supplementation with general anesthesia (Table 6). Complications included hypotension in 8 patients (10 %), nausea or vomiting in 4 (5 %) and bradycardia in 3 (3.75 %) all of which were correctable (Table 7).

Table 1

		80	patients.
	males	33	
	females	47	
age.	(Yr.)	17 – 75	(33.3 ± 14.0)
wt.	(Kg.)	35 – 72	(51.4 ± 8.2)
ht.	(Cm.)	140–170	(157.7 ± 7.5)

Table 2

Operations

Appendectomy	50	cases	(62.5 %)
GYN.	22	cases	(27.5 %)
Orthopedics	8	cases	(10.0 %)

Table 3

Onset

Sensory loss	3.03 ± 1.62	mins.
Motor block	2.44 ± 1.45	mins.

Table 4

Duration

Sensory	151.34 ± 60.62	mins.
Motor	222.93 ± 87.75	mins.

Table 5

Highest Level of Block T_1–T_{10}

	Before	*After*
BP mm.Hg	135.5 ± 16.0	112.7 ± 12.1
HR/min	86.7 ± 14.3	87.2 ± 14.73

Table 6

Results

Satisfactory	69	cases	(86.3 %)
Fair	6	cases	(7.5 %)
Poor	5	cases	(6.2 %)

Table 7

Complications

Hypotension	8	cases	(10 %)
Nausea or vomitting	4	cases	(5 %)
Bradycardia	3	cases	(3.7 %)

Discussion

Spinal anesthesia with bupivacaine was first reported by Ekblom and Widman in 1966. Its long duration of action makes it the local anesthetic drug of choice for long surgical or obstetrical procedures, for relief of postoperative or chronic pain or for inducing prolonged vasodilatation of the extremity. Bupivacaine is extremely safe. The complications which occured were minimal with no long term sequelae. Clinical experiences of 5001 spinal anesthesia using isobaric bupivacaine 0.5% for surgery were reported by H Nolte et al in 1977. The results were satisfactory and no neurological sequelae occured. Lanz, Schellenberg and Thesis in 1979[4] reported the use of 4 ml. 0.5% bupivacaine for spinal anesthesia on patients in the sitting position. The onset of analgesia in their patients was 9 mins. The duration of sensory block was 105 mins and 192 mins for motor block. No complication was reported. Pflug and Aasheim in 1976[5] reported the comparative study of bupivacaine and tetracaine for spinal anesthesia in 90 patients. The only difference noted was that the incidence of motor blockade by tetracaine was significantly greater. Both drugs provided satisfactory spinal anesthesia for all the surgical procedures duration of anesthesia was 143 mins. Transient hypotension was noted in about 3%, all in bupivacaine group. Our study with bupivacaine showed that the onset of motor and sensory block were 2.5 ± 1.5 mins and 3.0 ± 1.6 mins. Duration were 151.0 ± 60.0 mins and 222.0 ± 87.0 mins for sensory and motor blockade. Comparison of the results from various studies is difficult due to lack of standardization of the test procedures. The results were satisfactory in 86% only 6.2% needed supplementation. There were only very few and transient complications. We conclude that spinal anesthesia with 0.5% bupivacaine provides a safe and satisfactory anesthesia and appears suitable for long lower abdominal or orthopedic procedures. Its effect is often carried over into the postoperative period and then helps in lessening the postoperative analgesic requirement, the duration of motor blockade bother some patients but no real disturbance were observed.

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