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Original Research Paper

Pharmacology

COMPARISON BETWEEN LEVOBUPIVACAINE AND ROPIVACAINE FOR SPINAL ANAESTHESIA

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ABSTRACT

Aims: The aim of the present study was to compare the safety and efficacy of either plain ropivacaine 15 mg plain levobupivacaine 15 mg in patients undergoing surgery under spinal anaesthesia

Methods and Material: This was the cross sectional study done retrospectively using the record of various patient who had undergone spinal anaesthesia. This study was conducted at anaesthesiology department at Kota Medical College, Kota, Rajasthan.

Statistical analysis used: Statistical analysis was done using SPPS latest software using Unpaired t test. Chi square test was used to compare the frequency of various symptoms.

Results: no significant result was seen in any of the parameters between two drugs.

Conclusions: levobupivacaine and ropivacaine, both are equal in aspects of efficacy and potency, however multiple case control studies are recommended.

KEYWORDS : levobupivacaine and ropivacaine, spinal anesthesia

INTRODUCTION:

Any local anaesthetic must reversibly inhibit the nerve impulses by sensory or motor blockade Pain relief is by sensory blockade, however accompanying motor blockade may produce various side effect. Bupivacaine is a well-established long-acting regional anaesthetic, which like all amide anaesthetics has been associated with cardiotoxicity when used in high concentration or when accidentally administered intravascularly. Ropivacaine is a long-acting regional anaesthetic that is structurally related to Bupivacaine. Bupivacaine binds to the intracellular portion of sodium channels and blocks sodium influx into nerve cells, which prevents depolarization. Amide group local anaesthetics such as bupivacaine are metabolized primarily in the liver via conjugation with glucuronic acid. However, with clinical use, it was noted that using racemic mixture of bupivacaine resulted in cardiac and central nervous system toxicity in some patients(1)

Many studies had been conducted where efficacy and side effect of both drugs had been compared. These studies have been patient undergoing spinal anaesthesia for lower abdominal surgeries. Some author had also studied with brachial plexus block and epidural anaesthesia. However in our region, we had not came across any such studies. Hence we undertook this study.

The aim of the present study was to compare the safety and efficacy of either plain ropivacaine 15 mg plain levobupivacaine 15 mg in patients undergoing surgery under spinal anaesthesia.

SUBJECTS AND METHODS:

This was the cross sectional study done retrospectively using the record of various patient who had undergone spinal anaesthesia. This study was conducted at anaesthesiology department at Kota Medical College, Kota, Rajasthan.

Approval was obtained from institution ethics committee. Data was used from the medical record section of the medical college. One group consists of 50 no. patient who had received ropivacaine 15 mg. Other group include 50 no. of patient who had received levobupivacaine.

Inclusion criteria

- Age group 20-40 years
- Elective surgery

Exclusion criteria

- Smokers
- alcoholic
- Patient with history of neurological disorder
- Diabetes mellitus

All patients received spinal anaesthesia by standard procedure and no complications were recorded during the procedure. Bromage score were recorded from the record. Record of vital parameters was taken. Onset of motor block and sensory block was noted.

Statistical analysis was done using SPPS latest software using unpaired t test. Chi square test was used to compare the frequency of various symptoms.

RESULT:

Anthropometric parameters are show in table 1. There was no significant difference in any of the parameters. In table 2, other parameters are compared. We also got no significant difference between all thee parameters. There was also no significant difference between frequency of various adverse symptoms after spinal block.

Table 1: Anthropometric parameters in two group.

PARAMETERS	Patient who received ropivacaine 15 mg (n=50)	Patient who received levobupivacaine 15 mg (n=50)
Age (yrs)	31.51±8.31	33.1±10.11
Height (cms)	161.21±7.15	163.50±6.37
Weight (kg)	64.11±9.42	64.32±11.30
BMI (kg/m2)	23.13± 3.33	24.91 ±4.44
Duration of Surgery (mins)	73±2.38	78.94±2.38

no significant difference

Table 2: Characteristic of sensory and motor block

PARAMETERS	Patient who received ropivacaine 15 mg (n=50)	Patient who received levobupivacaine 15 mg (n=50)
Onset of sensory block (mins)	2.51±1.31	2.91±0.91
Onset of motor block (mins)	3.56±0.99	3.65±1.01
Duration motor block (mins)	152±7.15	141.21±7.15

Number of patient with the Bromage score of 3	23	21
Mean Bromage score	2.5±0.56	2.4±0.78

no significant difference

Table 3: Comparison of adverse event after spinal anaesthesia

PARAMETERS	Patient who received ropivacaine 15 mg (n)	Patient who received levobupivacaine 15 mg (n)
Nausea	6	5
Vomiting	5	4
Tremor	2	1

no significant difference

DISCUSSION:

The present study was done to see the difference in the safety and efficacy of either plain ropivacaine 15 mg plain levobupivacaine 15 mg in patients undergoing surgery under spinal anaesthesia. We were of the opinion that we could significant findings with levobupivacaine 15 mg, however we got no significant result between two drugs.

Our findings are contradiction with some studies. —(25) None of the author found result comparable to us.

NevalBoztuğ et al had compared the effects of intrathecal ropivacaine with bupivacaine in a dose ratio of 2:1 for outpatient arthroscopic knee surgery. Author opined that that isobaric ropivacaine 15 mg provided a higher sensory block level and shorter sensorial onset and offset times than did 7.5 mg of isobaric bupivacaine.

M. Camorcia et al levobupivacaine and ropivacaineproduce evidence of motor block within 5 min of intrathecal injection and could serve as tests of intrathecal administration. Ropivacaine is less potent for motor block than levobupivacaine(8)

Cappelleri, Gianluca et al concluded that 7.5 mg of 0.5% hyperbaric ropivacaine and 5 mg of 0.5% hyperbaric levobupivacaine provide adequate spinal block for outpatient knee arthroscopy, with a faster home discharge as compared with 7.5 mg of 0.5% hyperbaric levobupivacaine.(9)

Casati et al concluded that 8 mg of levobupivacaine or 12 mg of ropivacaine are better alternatives to 8 mg of bupivacaine .(10) He additionally studied efficacy in epidural anesthesia. He found that Levobupivacaine 0.5% produces an epidural block of similar onset, quality, and duration as the one produced by the same volume of 0.5% bupivacaine, with a motor block deeper than that produced by 0.5% ropivacaine. However when the effect was needed for long duration, he got the similar result.

During our literature search it was considered Levobupivacaine is a long-acting local anesthetic with much safer pharmaco-clinical profile in comparison to its parent compound bupivacaine. The most commonly reported side effects are hypotension, nausea, vomiting, dizziness, headache, tachycardia or bradycardia, back pain, and fetal distress syndrome in obstetrics. Apart from this, overdosage and unintentional intravascular injection may cause reactions with amide local anesthetics. Neurological damage is rare but well-recognized consequence of neuraxial blocks.

What may be cause of no significant difference in us? Biggest disadvantage of this study was that it was done from old records. This may be cause that data findings might have not recorded properly. Also here cases with the complications were avoided.

In conclusion, levobupivacaine and ropivacaine, both are equal in aspects of efficacy and potency, however multiple case control studies are recommended. Also, effect should be studied as compared to the dosage and concentration.

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