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SPINAL ANAESTHESIA WITH LEVOBUPIVACAINE AND HYPERBARIC BUPIVACAINE FOR EMERGENCY CESAREAN SECTION: A PROSPECTIVE STUDY AT A RURAL TERTIARY CARE CENTRE

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ABSTRACT

Introduction: Levobupivacaine is found to have a lower risk of cardiovascular and CNS toxicity than bupivacaine. **Aim:** To compare the sensory block, motor block, hemodynamic effects, Apgar score at 1 and 5 minutes and adverse effects if any) of intrathecal isobaric levobupivacaine with hyperbaric bupivacaine in spinal anaesthesia for caesarean section. **Methods:** 20 pregnant women in ASA I - II group scheduled to undergo emergency cesarean operation were included. The combinations 12.5 mg levobupivacaine (0.5%) for Group I (n = 10) patients, 12.5 mg hyperbaric bupivacaine (0.5%) for Group II (n =10) patients were intrathecally administrated. Sensory and motor block characteristics of the groups were assessed with pinprick and Modified Bromage scale, and side effects were noted. **Results:** The time to reach maximum dermatome for the sensory block, time to regression by two dermatomes and time to regress to T12 dermatome was found to be significantly long in Group II. It was observed that in Group II the evolution of the motor block was faster and lasted longer. **Conclusion:** Levobupivacaine with less side effect can be a good alternative to bupivacaine.

KEYWORDS : Spinal Anesthesia; Levobupivacaine; Bupivacaine; Cesarean Section

INTRODUCTION

Spinal anaesthesia was pioneered in humans by a German surgeon Dr August Bier on August 15th, 1898, using Quinke method of entering the intrathecal space. Current obstetric anaesthesia requires satisfactory analgesia and adequate muscle relaxation while minimizing the maternal and fetal side effects of the drug used caesarean delivery with bupivacaine is now popular.

Hyperbaric bupivacaine 0.5%, an amide local anaesthetic is presently the most common drug used for obstetric anaesthesia. Hyperbaric bupivacaine in 8% glucose is often used. Bupivacaine is hyperbaric in comparison with human CSF.[1,2] Clinically, this manifests as an unpredictable median sensory block height with a large inter-individual spread and is occasionally associated with block failure when the spinal block has not spread high enough for surgery.[3]

Levobupivacaine is less toxic to heart and CNS. When administered for caesarean section it has been shown to have motor blockade of lesser intensity when compared to bupivacaine. It is considered more potent than ropivacaine due to its greater lipid solubility. The plain levobupivacaine has been shown to be truly isobaric with respect to CSF of pregnant women.

This study compared the clinical effects sensory block, motor block, and adverse effects of intrathecal isobaric levobupivacaine with hyperbaric bupivacaine in spinal anaesthesia.

MATERIAL AND METHODS

This study included 20 women belonging to ASA I and II posted for emergency lower segment caesarean section at Dr RPGMC Kangra at Tanda. Patients refusing regional anesthesia, having contraindications to spinal anesthesia, weight > 100 kg, with systemic diseases, mothers with fetal anomaly, placenta previa, abruptio placenta were excluded.

Pin prick test was to assess the sensory block and patients asked about the sensation. Onset time for the sensory block defined as the time between injection of the drug to loss of sensation at L1 level. Sensation at Sensory duration defined as the period between injection and recovery of L1 level. The time for two dermatomal segments regression of sensory level was noted. Motor Block assessed by using Modified Bromage Scale. This was performed every minute until complete motor blockade and then every fifteen minute until recovery of complete motor function. Time taken for complete block and recovery were taken as onset and total block duration. The degree of motor block was assessed using Modified Bromage Scale.

Statistical Analysis

Data were entered into Microsoft® Excel 2007 and exported into SPSS v21.0 (IBM, USA) for statistical analysis. Categorical data were expressed as frequency, percentage, and compared using Chi square test. Quantitative data were expressed as mean, standard deviation, and compared using Student t-test. P<0.05 was considered significant.

RESULTS

General Characteristics

Table 1 shows general characteristics of the study participants. Both groups were comparable in terms of age, ASA grade, BMI, and duration of surgery (P>0.05).

Table 1: General Characteristics

	Group I	Group II	P value
Age (years)	22.15±3.79	23.71±4.18	>0.05
ASA grade (I:II)	12:8	13:7	>0.05
BMI (Kg/m^2)	23.31±2.14	23.12±2.13	>0.05
Duration of surgery (min)	42.16±6.17	44.12±7.17	>0.05

Spinal block characteristics

This study observed that onset of sensory and motor block was significantly earlier in group II in comparison to group I (P<0.05). The time taken for the sensory block to reach maximum level was longer in Group I and its maximum sensory block level was lower (p < 0.05). The time to regression by two dermatomes for the sensory block and time for complete sensory recovery were longer in group II (p < 0.05).

Table 2: Spinal Block Characteristics

	Group I	Group II	P value
Time to Onset of Sensory Block (min)	1:49±0:12	1:38±0:08	<0.001
Time for Two Segment Regression (min)	68.15±6.16	77.21±7.13	<0.001

Time for Complete Sensory Recovery (min)	150.11±17.06	165.00±9.19	<0.001
Time to Onset of Motor Block (min)	4:19±0:41	3:26±0:21	<0.001
Time for Duration of Motor Block (min)	117.78±10.29	143.11±10.55	<0.001

Time to require first analgesia

The time to first analgesic requirement was longer in Group II ($p > 0.05$).

Adverse Events

Incidence of adverse events such as hypotension, bradycardia, nausea, and vomiting were more common in the group II ($p < 0.05$).

Table 3: Adverse Events

	Group I	Group II	P value
Nausea	2	3	<0.05
Vomiting	2	2	
Headache	1	2	
Bradycardia	0	1	

DISCUSSION

In our study, sensory block levels required for cesarean section were achieved in both groups. In the study, we found the mean time for onset of sensory block was shorter for group bupivacaine. Guler et al[4] found onset of sensory block for bupivacaine was 1.46 ± 0.50 minutes and levobupivacaine was 2 ± 0.37 minutes which is in accordance with our study. Goyal et al[5] in their study also found similar results, onset of sensory block for levobupivacaine was 2.1 ± 0.15 minutes and for bupivacaine was 1.7 ± 0.23 minutes.

In the study we observed that total time for complete sensory recovery was significantly higher for bupivacaine. Sathitkarnmanee et al[6] in the study for lower limb surgeries found duration of sensory block for bupivacaine was 137.02 ± 40.01 minutes and levobupivacaine was 136.14 ± 45.32 minutes, statistically insignificant but duration were nearer to our study. In another study by Guler et al[4] regression time to T12 for the sensory block for bupivacaine was 145.50±11.01 minutes and for levobupivacaine was 162.33±10.56 minutes, which is statistically significant ($p<0.05$).

Quality of intra operative analgesia was satisfactory in most of the patients in both groups and the anaesthesia was well accepted by most of the patients in both groups.

In the study we observed that onset for motor block was earlier in bupivacaine group ($p< 0.05$). Sathitkarnmanee et al[6] found that onset for motor block for bupivacaine was 4.45±3.25 minutes and for levobupivacaine was 4.70±4.56, which are nearer to our values. Even in the study of caesarean sections performed by Guler et al[4] found motor onset of bupivacaine to be 2.36±0.61 minutes and for levobupivacaine 4.1±0.88 minutes which is significant statistically ($p< 0.05$).

We found the total duration of motor block was significantly higher for bupivacaine group. Guler et al[4] also found similar results where total duration of motor block for bupivacaine was 99 ± 9.13 minutes and for levobupivacaine was 132.66±7.15 minutes. Dar et al[7] also found results in accordance with our study, total duration of motor block in levobupivacaine group was 135±15.6 minutes and in bupivacaine group was 145 ± 20.5minutes, ($p< 0.05$).

In our study, hypotension occurred in both the groups but more fall in blood pressure was observed in bupivacaine group ($p< 0.05$) with more need for inj ephedrine ($p< 0,05$), which were statistically significant. Guler et al[4] also showed similar results with 5 out of 30 for group Levobupivacaine and 11 out of 30 for group Bupivacaine showed hypotension, which was significant ($p<0.05$) with more need for ephedrine.

Incidence of side effects like nausea, vomiting, bradycardia, itching, were more in bupivacaine group though all got treated with no sequelae. Gulen Guler et al[10] in also found incidence of nausea and vomiting higher in bupivacaine group whereas headache, itching and others had similar incidence in both groups. Incidences of side effects were more in bupivacaine group.[8]

CONCLUSION

Levobupivacaine with less motor block time is a better alternative for cesarean section.

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