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# Efficacy of Sub - Arachnoid Block Anaesthesia of 0.5% Bupivacaine Using 8 Mg & 12 Mg doses for Lower Segment Caesarean Section: A Comparative Study

**[1]Dr. Greeshma NagaKoduru, [2]Dr. Kalyan Chakravarthy, [3]Dr.Veeresham, [4]Dr.Hemnath Babu**

[1]Post Graduate, Dept. of Anaesthesia, Great Eastern Medical School& Hospital, Srikakulam, Andhra Pradesh, India

[2]Professor and Head of Department, Dept. of Anaesthesia, Great Eastern Medical School & Hospital, Srikakulam, Andhra Pradesh, India

[3,4]Professor, Dept. of Anaesthesia, Great Eastern Medical School & Hospital, Srikakulam, Andhra Pradesh, India

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**Corresponding Author:** Dr. Kalyan Chakravarthy, Professor and Head of Department, Dept. of Anaesthesia, Great Eastern Medical School & Hospital, Srikakulam, Andhra Pradesh, India

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## ABSTRACT

### Background

The most common surgery done in the United States is Caesarean section, which accounts for more than 30% of all births. Regional anaesthesia techniques have many benefits over general anaesthesia. The aim of the study is to compare the clinical effects of sub-arachnoid block anaesthesia of 0.5% hyperbaric bupivacaine using 8 mg & 12 mg doses for lower segment caesarean section (LSCS).

### Methods

Patients were divided randomly into two groups having 50 patients each. Group A received 8 mg (1.6ml) of intrathecal Bupivacaine heavy and Group B received Intrathecal Bupivacaine heavy 12mg (2.4ml). After induction of spinal anaesthesia, the patient was placed in a horizontal operation table, all parameters were monitored and recorded. Onset and height of sensory block monitored by blunt pinprick method and degree of motor block monitored by modified Bromage Score: (0-3).

### Results

There is no significant difference in the mean age between the two groups. There is a significant difference in the meanonset and time to reach block T4 level, which was faster in Group B compared to

Group A. The time to achieve complete motor block was early in Group B patients. Duration of sensory block was adequate for completion of surgery in both groups but significantly there is a prolonged motor block in Group B patients. There is no significant difference in the incidence of nausea/vomiting between the two groups.

**Conclusion**

There was a faster onset of anaesthesia and motor paralysis with 12 mg bupivacaine compared to8 mg hyperbaric bupivacaine when used for a subarachnoid block for LSCS.

**Keywords**

Lower segment caesarean section, hyperbaric bupivacaine, sub-arachnoid block, regional anaesthesia, general anaesthesia

Table 1. Modified Bromage scale

| Score | Criteria |
|---|---|
| 0 | The patient is able to move hip, knee, and ankle |
| 1 | Patient is unable to move hip but able to move knee and ankle |
| 2 | Patient is unable to move hip and knee but able to move ankle |
| 3 | Patient is unable to move hip, knee, and ankle |

**STATISTICAL ANALYSIS**

Data analysis was done using Epi Info software version 7.2.5. The results were expressed as mean ± S.D, percentages, and numerical parameters between the two groups were compared using the student's -test and categorical parameters were compared using the chi-square test. P value < 0.05 was considered significant.

**ETHICAL CONSIDERATIONS**

Ethical committee approval was taken before conducting the study. The informed consent form was taken from every patient who participated in the study.

**RESULTS**

Age: There is no significant difference in the mean age between two groups of patients (p=0.9).

**Table 1** Mean age in both groups

| Group | No. | Mean | SD | p-value |
|---|---|---|---|---|
| A | 50 | 23.3200 | 3.3651 | 0.9057 |
| B | 50 | 23.2400 | 3.3719 | |

Duration of mean sensory block: There isa significant difference in the duration of the mean sensory block between two groups, as per t-test.

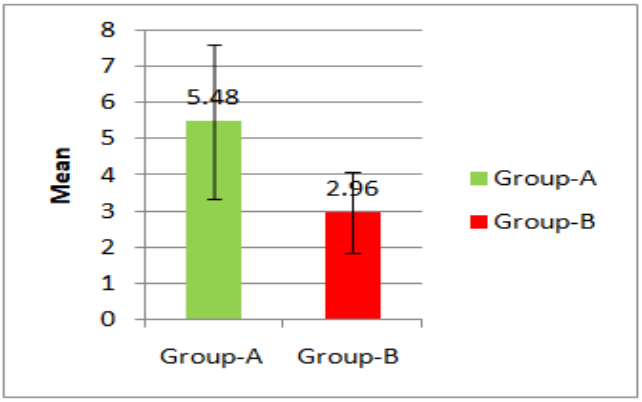
Table 2: Mean duration of sensory block

| Group | No. | Mean | p-value |
|---|---|---|---|
| A | 50 | 64.6±11.1 | <0.0001 |
| B | 50 | 45.2±6.4 | |

Maximum time to reach sensory block:

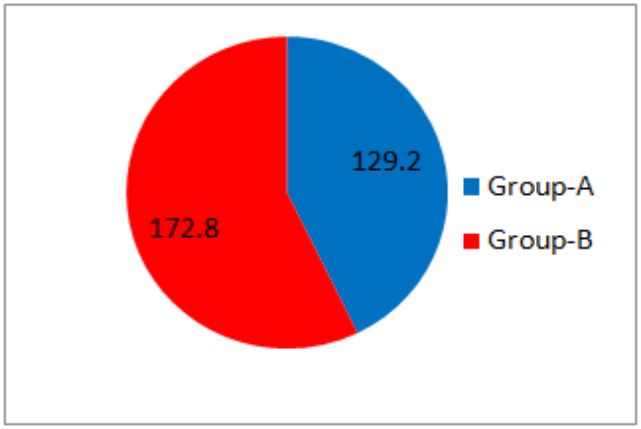
There is a significant difference in maximum time to reach sensory block between two groups, as per t-test. (p=0.001)

**Graph 1** Max. time to reach sensory block



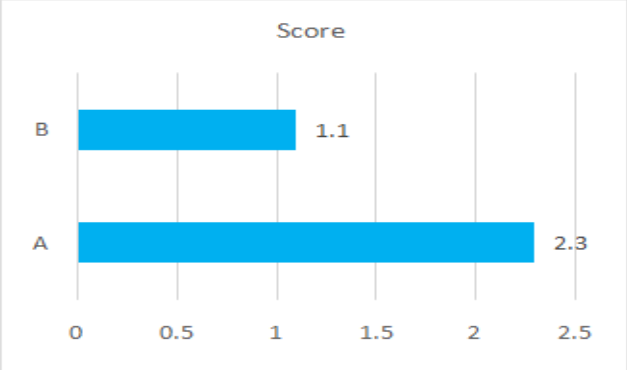

Mean motor regression: There is a significant difference in mean motor regression between two groups, as per t-test. (p=0.001)

**Graph 2** Mean motor regression in two groups




**Bromage score** There is a significant difference in the mean Bromage score between the two groups.(p=0.001).

**Graph 2** Mean bromage score in two groups




**Complications** There is no significant difference in the incidence of complications between the two groups as per chi-square analysis (p=0.50).

**Table 3** Nausea/Vomiting in both groups

| COMPLICATIONS | | | |
|---|---|---|---|
| **Nausea/Vomiting** | **A** | **B** | **Total** |
| **NO** | 46 | 44 | 90 |
| Row % | 51.1 | 48.9 | 100.0 |
| Col % | 92.0 | 88.0 | 90.0 |
| **YES** | 4 | 6 | 10 |
| Row % | 40.0 | 60.0 | 100.0 |
| Col % | 8.0 | 12.0 | 10.0 |

## DISCUSSION

Hyperbaric bupivacaine is the most commonly used agent for spinal anaesthesia whiledoinga caesarean section.[6] Its duration of action of 1.5 to 2 hours is perfectly matched with the duration of surgery in most of thecases. Though some authors have advocated a sliding scale of doses that depend on patient height, most of thepractitioners are now using a fixed dose of hyperbaric bupivacaine.Though increasing the dose of the spinal anaesthetic drugs increases the height of block, dose more than 15 mg significantly increases the risk of complications, and are not recommended.[7]In this study, a comparison is made on the clinical effects of subarachnoid block anaesthesia of 0.5% Bupivacaine using two different doses ie, 8mg (1.6ml) & 12mg (2.4ml) for LSCS in terms of onset of action of sensory block (sec), time to reach maximum level of sensory & motor block, time for regression of motor block after surgery & also to compare complications. The randomized controlled trial by Hirao O et al.[8] in 2003 shows thatamong the three dosages of bupivacaine, the time interval requiring for the anaesthetic level to reach T4 tended to be shorter with a larger amount of bupivacaine. Nagata E et al.[8]showed, among 79% of patients who were given 8 mg bupivacaine and among 88% of patients who were given 10 mg, the sensory block

level reached T4 in 10min after spinal anaesthesia.Mean time to reach motor block up to Bromage Score – 3 in Group A patients was 2.3 mins, which is significantly higher than in Group B patients of 1.1 mins with p- value 0.000. N. Biswas et al.[10]in 2002found that time to progress motor block up to Bromage Score – 3 with 10mg Bupivacaine in the caesarean section was 5±1 mins and Osama[11]et al.found it to 6.4 ± 0.3 mins with 11.25 mg Bupivacaine. In the study done by Lee Y et al authors found that obese and normal-weight patients should receive similar doses of hyperbaric bupivacaine. [12]

Previous similar studies done proved the efficacy of low dose hyperbaric bupivacaine in LSCS.[13-20]

## CONCLUSION

There was faster onset of anaesthesia and motor paralysis with 12 mg compared to 8 mg of hyperbaric Bupivacaine used for subarachnoid block for LSCS. As far as the duration of anaesthesia is concerned, the smaller dose of 8 mg is adequate to cover the duration of LSCS surgery which usually takes about an hour. The persistence of motor block post-operatively for a longer time with a larger dose of 12 mg is unnecessary and disadvantageous. Thus, from our study results, it can be concluded that the Injection of 8 mg hyperbaric bupivacaine is preferable to 12 mg for spinal anaesthesia in a sitting position for caesarean section to obtain adequate analgesic efficacy and to avoid excessive maternal side effects.

The study is self-sponsored.

There were no conflicts of interest.

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## REFERENCES

1. Kochanek KD, Kirmeyer SE, Martin JA, Strobino DM, Guyer B. Annual summary of vital statistics: 2009. Pediatrics. 2012 Feb;129(2):338-48. doi: 10.1542/peds.2011-3435. Epub 2012 Jan 30. PMID: 22291121; PMCID: PMC4079290.
2. Bhasin SK, Roy R, Agrawal S, Sharma R. An epidemiological study of major surgical procedures in an urban population of East delhi. Indian J Surg. 2011 Apr;73(2):131-5. doi: 10.1007/s12262-010-0198-x. Epub 2010 Nov 30. PMID: 22468063; PMCID: PMC3077158.
3. Riley ET, Cohen SE, Macario A, Desai JB, Ratner EF. Spinal versus epidural anesthesia for cesarean section: a comparison of time efficiency, costs, charges, and complications. AnesthAnalg. 1995 Apr;80(4):709-12. doi: 10.1097/00000539-199504000-00010. PMID: 7893022.
4. Fettes PD, Jansson JR, Wildsmith JA. Failed spinal anaesthesia: mechanisms, management, and prevention. Br J Anaesth. 2009 Jun;102(6):739-48. doi: 10.1093/bja/aep096. Epub 2009 May 6. PMID: 19420004.
5. Malav K, Singariya G, Mohammed S, Kamal M, Sangwan P, Paliwal B. Comparison of 0.5% Ropivacaine and 0.5% Levobupivacaine for Sciatic Nerve Block Using Labat Approach in Foot and Ankle Surgery. Turk J AnaesthesiolReanim. 2018 Feb;46(1):15-20. doi: 10.5152/TJAR.2017.03411. Epub 2017 Nov 27. PMID: 30140496; PMCID: PMC5858883
6. Sdrales LM, Miller RD. Miller's anesthesia review E-book: Expert consult - online and print. 2nd ed. Saunders; 2012
7. Teunkens A, Vermeulen K, Peters M, Fieuws S, Van de Velde M, Rex S. Bupivacaine infiltration

in children for postoperative analgesia after tonsillectomy: A randomised controlled trial. Eur JAnaesthesiol. 2019 Mar;36(3):206-214. [PubMed

8. Hirao O, Kinouchi K, Haruna J, Matsuda Y, et al. [Spinal anesthesia using hyperbaric bupivacaine HCl for cesarean section]. Masui. 2003 Sep;52(9):953-8. Japanese. PMID: 14531252.
9. Nagata E, Yoshimine K, Minoda Y, Kawaguchi Y, Sakamoto M, Takehara A. [Comparison of 8 mg and 10 mg hyperbaric bupivacaine during spinal anesthesia for cesarean section in Japanese parturients]. Masui. 2004 Feb;53(2):131-6. Japanese. PMID: 15011419.
10. Dr. B. N. Biswas et al. intrathecal fentanyl with hyperbaric bupivacaine improves analgesia during caesarean delivery and in early post-operative period. Indian J. Anaesth. 2002; 46 (6) : 469-472.
11. Osama Al- Abdulhadi, Dhane Biehl, bill ong, and Abdulaziz Boker. hyperbaric spinal ropivacaine to hyperbaric spinal bupivacaine for elective cesarean delivery. M.E.J. ANESTH 19 (2), 2007.
12. Lee Y, Balki M, Parkes R, Carvalho JC Dose requirement of intrathecal bupivacaine for cesarean delivery is similar in obese and normal weight women Rev Bras Anestesiol. 2009 Nov-Dec;59(6):674-83.
13. Leo S, Sng BL, Lim Y, Sia AT. A randomized comparison of low doses of hyperbaric bupivacaine in combined spinal-epidural anesthesia for cesarean delivery. AnesthAnalg. 2009 Nov;109(5):1600-5. PMID: 19843797.
14. Turhanoglu S, Kaya S, Erdogan H. Is there an advantage in using low-dose intrathecal bupivacaine for cesarean section? J Anesth. 2009;23(3):353-7. doi: 10.1007/s00540-009-0750-7. Epub 2009 Aug 14. PMID: 19685114
15. Bryson GL, Macneil R, Jeyaraj LM, Rosaeg OP. Small dose spinal bupivacaine for Cesarean delivery does not reduce hypotension but accelerates motor recovery. Can J Anaesth. 2007 Jul;54(7):531-7. doi: 10.1007/BF03022316. PMID: 17602038.
16. Guasch E1, Suárez A, Bermejo JM, Gilsanz F. [Randomized controlled trial comparing a low dose to a conventional dose of hyperbaric bupivacaine for scheduled cesarean section]. Rev EspAnestesiolReanim. 2005 Feb;52(2):75-80.
17. Roofthooft E1, Van de Velde MLow-dose spinal anaesthesia for Caesarean section to prevent spinal-induced hypotension. CurrOpinAnaesthesiol. 2008 Jun;21(3):259-62.
18. Sparks CJ, Perndt H, Agiomea K, Fa'arondo J. Spinal anaesthesia for caesarean section in the Solomon Islands. Anaesth Intensive Care. 1994 Apr;22(2):187-91. doi: 10.1177/0310057X9402200213. PMID: 8210024
19. Chung CJ, Bae SH, Chae KY, Chin YJ. Spinal anaesthesia with 0.25% hyperbaric bupivacaine for Caesarean section: effects of volume. Br J Anaesth. 1996 Aug;77(2):145-9. doi: 10.1093/bja/77.2.145. PMID: 8881614
20. Teoh WH, Ithnin F, Sia AT. Comparison of an equal-dose spinal anesthetic for cesarean section and for postpartum tubal ligation. Int J ObstetAnesth. 2008 Jul;17(3):228-32. doi: 10.1016/j.ijoa.2007.10.006.PMID: 18513944.