

Assessment of Efficiency of Different Local Extradural Anaesthetic Solutions For Elective Caesarean Section: A Comparative Study

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ABSTRACT

Background: Bupivacaine is indicated for local infiltration, peripheral nerve block, sympathetic nerve block, and epidural and caudal blocks. The present study was conducted to assess the efficiency of different local extradural anesthetic solutions for elective caesarean section.

Materials & Methods: The present study was conducted in the department of Anesthesia on 60 women underwent elective caesarean. They were divided into 3 groups of 20 each. Group I received 0.5% bupivacaine, group II received 0.5% bupivacaine along with 1: 200000 adrenaline and group III received 2% lignocaine with 1: 200000 adrenaline. Efficacy of each anesthetic solution was recorded.

Results: In group I, pain intensity was none (12), mild (4), moderate (4), in group II, it was none (15), mild (3), moderate (2), in group III, it was none (8), mild (10), moderate (2). The difference was non- significant. The response was excellent (13), very good (5), good (3), fair (1) and poor (1) in group I. Similarly, in group II, it was excellent (13), very good (7) and in group III, it was excellent (10), very good (4), good (3), fair (3).

The difference was non- significant.

Conclusion: Author concluded that combination of bupivacaine and adrenaline is more effective and efficient in terms of pain and discomfort as compared to bupivacaine alone in elective caesarean sections.

Key words: Bupivacaine, Caesarean, Extradural.

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Article History:

Received: 12-06-2016, Revised: 15-07-2016, Accepted: 25-07-2016

Access this article online

Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2016.2.4.052	

INTRODUCTION

Bupivacaine 0.5 % plain is the most commonly used agent for Caesarean section under extradural block. Bupivacaine is used by injecting it into the area, around a nerve that supplies the area, or into the spinal canal's epidural space. It is available mixed with a small amount of epinephrine to make it last longer. It typically begins working within 15 minutes and lasts for 2 to 8 hours.¹

Bupivacaine is indicated for local infiltration, peripheral nerve block, sympathetic nerve block, and epidural and caudal blocks. It is sometimes used in combination with epinephrine to prevent systemic absorption and extend the duration of action. The 0.75% formulation is used in retrobulbar block. It is the most commonly used local anesthetic in epidural anesthesia during labor, as well as in postoperative pain management.² A number of factors have been under consideration as possible influences on the rising caesarean rate. Changing risk profiles among increasingly older primiparae are often cited as a reason for the rise in caesarean deliveries. An increase in maternal request caesarean sections also plays a part. However, the rise in caesarean section rates should not be viewed in isolation from changes in society.³ Lidocaine, also known as xylocaine is mixed with a small amount of adrenaline is available to allow larger doses for numbing, to decrease bleeding, and to make the numbing effect last longer.

When used as an injectable, it typically begins working within four minutes and lasts for half an hour to three hours.

Lidocaine mixtures may also be applied directly to the skin or mucous membranes to numb the area.⁴ The present study was conducted to assess the efficiency of different local extradural anaesthetic solutions for elective caesarean section.

MATERIALS & METHODS

The present study was conducted in the department of Anesthesia, THAR Hospital, Barmer, Rajasthan, India. It included 60 women underwent elective caesarean. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained from institutional ethical committee.

General information such as name, age, gender etc. was recorded. They were divided into 3 groups of 20 each as follows:

- Group I received 0.5% bupivacaine,
- Group II received 0.5% bupivacaine along with 1: 200000 adrenaline and
- Group III received 2% lignocaine with 1: 200000 adrenaline.

Efficacy of each anesthetic solution was recorded and results thus obtained were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

RESULTS

Table 1 shows that group I received 0.5% bupivacaine, group II received 0.5% bupivacaine along with 1: 200000 adrenaline and group III received 2% lignocaine with 1: 200000 adrenaline. The difference was non- significant (P- 1).

Table 2 shows that in group I, pain intensity was none (12), mild (4), moderate (4), in group II, it was none (15), mild (3), moderate

(2), in group III, it was none (8), mild (10), moderate (2). The difference was non- significant (P- 0.01). Graph 1 shows that response was excellent (13), very good (5), good (3), fair (1) and poor (1) in group I. Similarly, in group II, it was excellent (13), very good (7) and in group III, it was excellent (10), very good (4), good (3), fair (3). The difference was non- significant (P> 0.05).

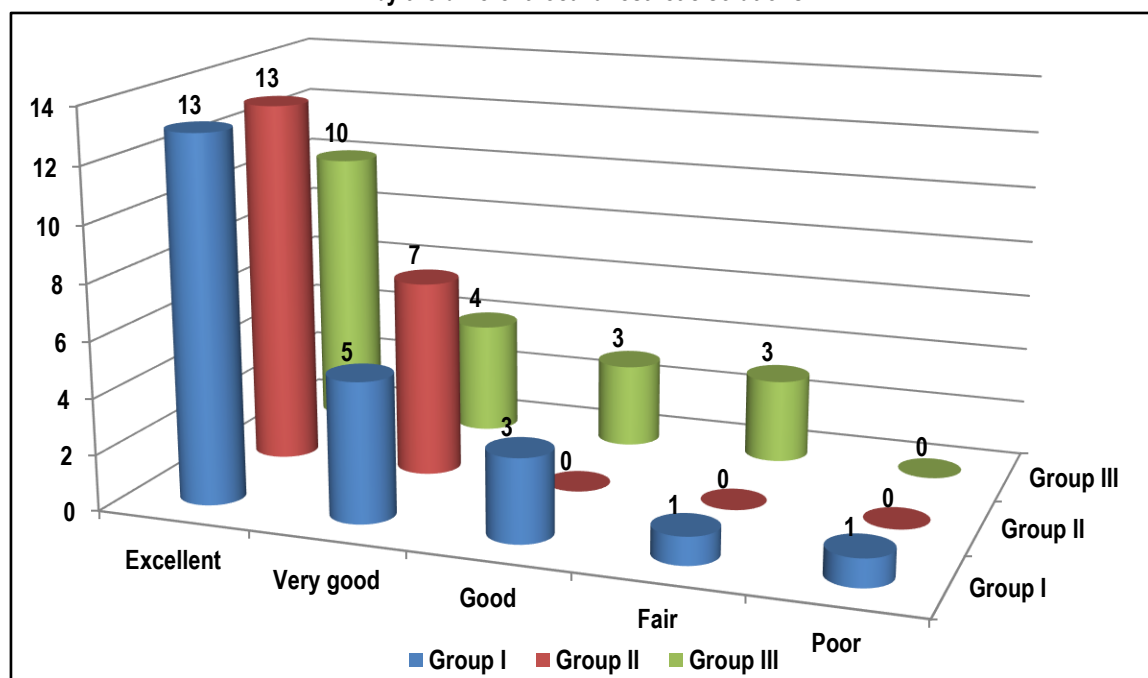
Table 1: Distribution of patients

Total- 60			
Group I 0.5% bupivacaine	Group II 0.5% bupivacaine along with 1: 200000 adrenaline	Group III 2% lignocaine with 1:200000 adrenaline	P value
20	20	20	1

Table 2: Pain or discomfort in each group

Pain	Group I	Group II	Group III	P value
None	12	15	8	0.01
Mild	4	3	10	
Moderate	4	2	2	
Severe	0	0	0	

Graph 1: Assessment by the patients and anesthetists of the extradural block produced by the different local anesthetic solutions



DISCUSSION

In previous studies, the quality of the block produced by lignocaine with adrenaline was considered similar to that of bupivacaine, with or without adrenaline. Bupivacaine binds to the intracellular portion of voltage-gated sodium channels and blocks sodium influx into nerve cells, which prevents depolarization. Without depolarization, no initiation or conduction of a pain signal can occur. Bupivacaine crosses the placenta and is a pregnancy category C drug. However, it is approved for use at term in obstetrical anesthesia. Bupivacaine is excreted in breast milk.⁵

In present study, we included 60 women who underwent elective caesarean. In terms of pain and discomfort, group II found better as compared to group I and group III. This is in agreement with Datta et al.⁶ A study by Howel et al.⁷ shows that a mixture of bupivacaine and lignocaine provided an excellent alternative to bupivacaine alone, and was superior to 2% lignocaine with adrenaline for elective caesarean section. By reducing the dose of bupivacaine used, the combination may reduce the risk of cardiotoxicity. Efficacy profile of lidocaine as a local anaesthetic is

characterized by a rapid onset of action and intermediate duration of efficacy. Therefore, lidocaine is suitable for infiltration, block, and surface anesthesia. Longer-acting substances such as bupivacaine are sometimes given preference for spinal and epidural anesthetics; lidocaine, though, has the advantage of a rapid onset of action. Adrenaline vasoconstricts arteries, reducing bleeding and also delays the resorption of lidocaine, almost doubling the duration of anesthesia.⁸

Lidocaine is one of the most commonly used local anaesthetics in dentistry. It can be administered in multiple ways, most often as a nerve block or infiltration- depending on the type of treatment carried out and the area of the mouth worked on. For surface anaesthesia, several formulations can be used for endoscopies, before intubations, etc. Buffering the pH of lidocaine makes local numbing less painful. Lidocaine drops can be used on the eyes for short ophthalmic procedures. There is tentative evidence for topical lidocaine for neuropathic pain and skin graft donor site pain.⁹ There is a wide variation in the doses of local anesthetic agent required to produce extradural blockade suitable for Caesarean section. More extensive blocks require a greater dose of local anesthetic agent, but at the expense of a more frequent incidence of hypotension. In addition, peak blood concentrations of local anaesthetic agents have been shown to be significantly greater after a large single bolus than when an incremental technique was used for Caesarean section. Several authors have observed a direct relationship between the patient's height and the spread of local anesthetic agent in the extradural space.^{10,11}

CONCLUSION

Author concluded that combination of bupivacaine and adrenaline is more effective and efficient in terms of pain and discomfort as compared to bupivacaine alone in elective caesarean sections.

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Source of Support: Nil.

Conflict of Interest: None Declared.

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Cite this article as: Mahendra Kumar. Assessment of Efficiency of Different Local Extradural Anaesthetic Solutions For Elective Caesarean Section: A Comparative Study. *Int J Med Res Prof.* 2016; 2(4):210-12.