



## COMPARISON OF EFFECTIVENESS OF INTRATHECAL INJ. MAGNESIUM SULFATE 50 MG (MILLIGRAM) VS INJ. MAGNESIUM SULFATE 100 MG (MILLIGRAM) AS ADJUVANTS TO INJ. BUPIVACAINE IN SPINAL ANAESTHESIA IN CESAREAN SECTION

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**ABSTRACT** **Background:** the present study aim was different doses of magnesium sulphate to bupivacaine for spial anaesthesia in terms of block charecteristics, haemodynamic and safty profile.

**Methods:** sixty ASA grade I–II patients undergoing caeserian section were divided into two groups.

**Group D-** (n=30) :Inj. Bupivacaine 0.5% hyperbaric 2 ml + Inj. Magnesium sulfate 50 mg

**Group B-** (n=30) :Inj Bupivacaine 0.5% hyperbaric + Inj. Magnesium sulphate 100 mg

**Results** mean time for analgesia in group D was 122.3333±9.71431, in group B was 138.1667±17.5422 which was statistically significant (p<0.05) **Conclusion** 50mg mgso4 increase duration of analgesia without alteration in hemodynamics ,with 100mg analgesia is for longer than 50mg but chance of fall in systolic blood pressure more at 3 and 5 min after induction.

### KEYWORDS :

#### INTRODUCTION

August Bier (1898) introduced spinal analgesia in clinical practice. Since then, the technique has been widely practiced to provide anaesthesia, particularly for surgery below umbilicus. It has a very rapid onset and provides a dense neural block which can produce highly effective pain relief for a wide variety of indications and may decrease patient morbidity after major surgery and moreover, failures are very infrequent<sup>[1,2]</sup>.

Spinal anaesthesia for caesarean delivery is associated with 80% of hypotension cases without prophylactic measures<sup>[3]</sup>. Many interventions such as pelvic tilt<sup>[4]</sup>, leg elevation, wrapping<sup>[5]</sup> and prophylactic administration of fluids<sup>[6]</sup> or vasopressors<sup>[7]</sup> have been proposed and used to reduce the incidence of maternal hypotension. Despite all these measures, approximately 25% of patients still experience hypotensive episodes.<sup>[7]</sup>

#### AIMS AND OBJECTIVES

##### To study and Compare

- Post op analgesia of Inj. Magnesium Sulfate 50 Mg Vs Inj. Magnesium Sulfate 100 Mg as Adjuvants To Inj. Bupivacaine in spinal anaesthesia in cesarean section
- Hemodynamic changes intra-operatively
- Duration of motor blockade
- Duration of Sensory block
- Regression of the effect of subarachnoid block

##### Pharmacology of Bupivacaine<sup>(60-61)</sup>

Bupivacaine is an amide type of local anaesthetic drug and was synthesized in Sweden in 1957 by Ekanstan and his colleagues and used clinically by L.J. Telivno in 1963.

Chemical name: 1-butyl-2-piperidyl 2, 6 xylidenene hydrochloride  
Bupivacaine exists in 2 stereoisomeric forms with different anaesthetic and vasoactive properties.

##### Pharmacokinetics:

##### Absorption:

##### Distribution:

- 30% plasma protein bound.

##### Excretion:

More than 50% dose is excreted by kidney

#### MATERIALS AND METHOD

After getting approval from the hospital Ethical Committee, a double blind randomized clinical study is conducted on 60 patients of ASA grade 1,2 and 3 belonging to the age group of 18-65 years undergoing caesarean section surgery.

Patients will be divided into 2 groups

**Group D-** (n=30) :Inj. Bupivacaine 0.5% hyperbaric 2 ml + Inj. Magnesium sulfate 50 mg

**Group B-** (n=30) :Inj Bupivacaine 0.5% hyperbaric + Inj. Magnesium sulphate 100 mg

##### A) Inclusion Criteria:

- Age – 18-65 years
- ASA grade- 1,2,3
- Patient approval
- Undergoing caesarean section delivery

##### B) Exclusion Criteria:

- Patient refusal
- ASA grade 4
- Sensitivity to the Local anesthetics being used
- Age <18 years or >65 years
- Contraindications to spinal anesthesia- Bleeding diathesis, local skin infections, neurological diseases, Cardiac or renal insufficiency

##### 1. Pre-anesthetic Preparation:

All patients will be thoroughly assessed for history, and examined in detail, both general and systemic examinations. All subjects fulfilling the inclusion criteria will be explained about the purpose, procedure and side effects of the procedure. Informed consent will be obtained from them. Patients will be kept adequately nil by mouth. Venous access will be obtained, basic monitors will be attached like NIBP, pulse oximetry, ECG and vitals of the patient will be recorded and local sensitivity testing will be done. Patients will be pre-loaded with 15ml/kg of Inj Ringer Lactate IV fluid.

##### 2. Pre-medication :

Inj. Glycopyrrolate 4ug/kg Iv slowly  
Inj. Ondansetron 80ug/kg iv slowly

##### 3. Technique:

After initial preloading with Inj Ringer Lactate, Spinal anaesthesia is given with Inj. Bupivacaine 0.5% hyperbaric 2 ml + Inj. Magnesium 50 mg in Group D and Inj Bupivacaine 0.5% hyperbaric + Inj. Magnesium sulphate 100 mg in group B, intrathecally, with a 25G BD spinal needle in lateral decubitus position under all aseptic and antiseptic precautions after appearance of free flowing and clear cerebrospinal fluid. Patients were immediately placed in supine position.

##### 4. Observations :

Vitals were monitored regularly after the Subarachnoid block was given. The following parameters were also noted

- Time of onset of block
- Highest sensory level achieved
- duration of sensory block
- two segment regression time
- duration of motor block
- hypotension, bradycardia and other hemodynamic changes
- quality of analgesia by VAS score or other pin prick for anaesthesia level.

- Side effects like nausea, vomiting, hypotension, tachycardia, bradycardia, urinary retention

**5. Monitoring:**

Charting of intraoperative vital parameters was done like temperature, heart rate, respiratory rate, Blood pressure, SPO<sub>2</sub>.

**6. Complications:**

- Headache
- Hypotension
- Nausea, vomiting
- Tachycardia, bradycardia
- Urinary retention

Quality of analgesia throughout operation and post operative period was assessed by using visual analog scale (VAS) scoring system, in which they were asked to point to various facial expression on 10cm horizontal line ranging from smiling face (no pain) at one end to an extremely unhappy one that express worst possible pain at other end

**OBSERVATION AND RESULTS**

The present prospective, randomized, comparative, clinical study was conducted in 60 patients of ASA grade 1,2, or 3 posted for caesarian section for different indication, study patients were randomly divided into 2 groups with 30 patients in each group

**Table 1 Comparison Of Sbp In Two Different Groups Of Patients Studied**

time	Group D Mean±sd	Group B Mean±sd	P value	Significance
Before premedication	123.86±8.48	124.86±8.95	>0.05	NS
Before induction	123.26±8.73	126.13±2.96	>0.05	NS
After induction				
1 min	110.66±7.52	111.4±6.85	>0.05	NS
3min	108.93±5.60	89.06±2.55	<0.05	S
5min	108.2±6.31	95.06±2.16	<0.05	S
10min	108.4±5.71	109.93±5.47	>0.05	NS
15min	109.33±4.90	110.26±4.35	>0.05	NS
30min	110.13±4.81	110.93±5.65	>0.05	NS
45 min	109.8±5.15	110.6±5.99	>0.05	NS
60min	110.26±5.24	111.26±6.52	>0.05	NS
90min	110.73±5.02	111.53±6.8	>0.05	NS
120min	110.93±5.40	112.86±6.9	>0.05	NS
150min	114.54±5.22	111.63±6.94	>0.05	NS

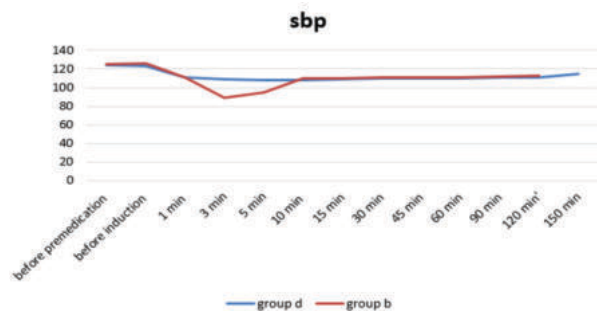
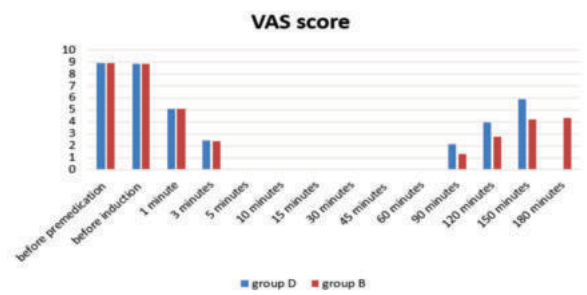


Table 1 and chart 1 shows that both groups were comparable regarding systolic blood pressure before and after spinal anaesthesia except for very short duration following subarachnoid block. there occurred hypotension in both group D but the different significantly only at 3, 5 minute after induction

**Table 2 Visual Analogue Scale Score**

Duration in minutes	N		Mean ± SD		P value	Inference
	Group D	Group B	Group D	Group B		
Before premedication	30	30	8.86±0.34	8.9±0.30	>0.05	NS
Before induction	30	30	8.83±0.37	8.8±0.40	>0.05	NS
After induction						
1 min	30	30	5.1±1.02	5.06±0.98	>0.05	NS

3 min	30	30	2.46±0.50	2.4±0.49	>0.05	NS
5 min	30	30	0	0	>0.05	NS
10 min	30	30	0	0	>0.05	NS
15 min	30	30	0	0	>0.05	NS
30 min	30	30	0	0	>0.05	NS
45 minutes	30	30	0	0	>0.05	NS
60 minutes	30	30	0	0	>0.05	NS
90 minutes	30	30	2.1±0.48	1.33±0.54	>0.05	NS
120 minutes	30	30	3.93±0.94	2.76±0.93	>0.05	NS
150 minutes	11	22	5.90±0.53	4.2±1.005	<0.05	S
180 minutes	0	6	0a	4.33±0.51	>0.05	NS



This table no 2 shows comprehensive and statistical analysis of change in VAS score during intra operative and post operative periods in both groups, which was statistically not significant except at 150 min In group D mean VAS score was 5.90±0.53 in group B was 4.2±1.005 which was statistically significant (p<0.05) at 150min.

**DISCUSSION**

This study was designed to compare to different dose inj Mgso4 50 mg vs. inj Mgso4 100mg as adjuvants to inj Bupivacaine heavy (0.5%) in spinal anaesthesia in cesarean section supposing that patients hemodynamics could be better with inj Mgso4 50mg and post op analgesia will be longer in ing mgso4 100 mg .our study design consisted of 60 female patients aged 18 to 65 years ,ASA Physical status I to III under going lower cesarean section under spinal anaesthesia were randomly divided into two groups . Group D Patient's received inj 0.5% Bupivacaine heavy 2ml and inj mgso4 50 mg and group B patients received inj 0.5% Bupivacaine heavy and inj mgso4 100mg intrathecally . The following parameters were observed

1. Sensory and Motor blockade : Onset, Highest, level of sensory blockade and time to achieve peak sensory blockade
2. Recovery parameters: Time for two segment regression, duration of sensory block at T10 and time for complete sensory and motor recovery
3. Analgesia by visual analog score
4. Side effects/complications

**Onset of Sensory and Motor Blockage**

In present study mean duration of onset of sensory block start at shin of tibia in group D is 19.86±4.01 sec In group B It is 21.70±3.77 sec which was statistically not significant (p>0.005)

**Timr For L1 Sensory Level And Highest Sensory Level Blockade And Time For Two Segment Regression**

In present study mean time of sensory block at L1 in group D was 57.16±11.27 sec, in group B 58.16±12.06 sec which was not significant statistically (p>0.05)

As shown here the mean time of highest sensory level (T6) in group D was 81.1±29.80 sec, in group B 79.93±24.62 sec which was not significant statistically (p>0.05) the mean time of two segment regression in group D was 37.56±3.94 sec, in group B 37.31±3.75 sec which was not significant statistically (p>0.05)

**Time To Achieve Complete Motor Block**

In present study mean time for onset of motor block in group D was 2.44±0.63 min and group B was 2.40±0.56 min which was statistically not significant (p>0.05)

Mean time for total duration of motor block in group D was 108±8.86 min and group B was 114.83±13.61 min which was statistically not significant (p>0.05)

**Duration Of Analgesia And Hemodynamic Stability**

y. IN present study 9 mean time for analgesia in group D was  $122.3333 \pm 9.71431$ , in group B was  $138.1667 \pm 17.5422$  which was statistically significant ( $p < 0.05$ ) that mean pulse rate was comparable in both groups at all time before and after spinal anaesthesia, after applying paired t test there was no significant difference ( $p > 0.05$ ) Both groups were comparable regarding systolic blood pressure before and after spinal anaesthesia except for very short duration following subarachnoid block. there occurred hypotension in both group but the different significantly only at 3, 5 minute after induction at 3 min after induction mean of SBP in group D was  $108.93 \pm 5.60$  in group B was  $89.06 \pm 2.55$  which was statistically significant ( $p < 0.05$ ) at 5 min after induction mean of SBP in group D was  $108.2 \pm 6.31$  in group B was  $95.06 \pm 2.16$  which was statistically significant ( $p < 0.05$ ) it shows that after induction at 3 min and 5 min SBP falls more in group B as compared to group D.

## CONCLUSION

This randomized double blind clinical study comparing mgso4 in different dose of 50 mg and 100 mg added to hyperbaric bupivacaine for the caesarean section shows all technique provide safe and effective anaesthesia but 50mg mgso4 increase duration of analgesia without alteration in hemodynamics, with 100mg analgesia is for longer than 50 mg but chance of fall in systolic blood pressure more at 3 and 5 min after induction.

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