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# ORIGINAL ARTICLE

## A CLINICAL STUDY OF EFFECT OF SPINAL FENTANYL ON SUBARCHNOID BLOCK IN PARTURIENTS

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**ABSTRACT: BACKGROUND & OBJECTIVES:** Subarchnoid block (SAB) is commonly employed for cesarean delivery. The use of opioids has gained widespread popularity as they augment the analgesia produced by local anaesthetic through direct binding with specific receptors. Hence the present study was undertaken to study the effects of spinally administered fentanyl 12.5μg on the onset and duration of 2 ml of 0.5% bupivacaine (H) induced sensory and motor subarchnoid block, quality of intraoperative surgical anaesthesia and requirements of analgesia during early postoperative period. **MATERIAL & METHODS:** Ninety healthy parturients of ASA Grade I and II scheduled for elective caesarean section(LSCS) were randomly allocated to receive either 2ml of 0.5% Bupivacaine (H) with 0.25 ml of CSF (Group BC n = 45) or 2 ml of 0.5% bupivacaine (H) with 0.25 ml 12.5μg fentanyl (Group FB n = 45). Parturients were pre-loaded with 0.5 L of Ringer lactate and premedicated with in metoclopromide 10mg and. ranitidine 50mg IV. Vital signs, sensory level, motor block, pain score and side effects were observed every 120 seconds for first 10 minutes, then at 15minutes for 1$^{ST}$ hour, thereafter at 0.5 hours interval until the patient complained of pain. **OBSERVATIONS:** Time of onset of sensory analgesia was rapid in Group FB. Time for two segment regression, time for sensory regression to $L_1$ and time for complete sensory recovery was prolonged in Group FB. The total duration of analgesia was prolonged in Group FB, i.e. 259.4±32.53 minutes when compared to Group BC, i.e. 165 ± 29.8 minutes. **DISCUSSION & CONCLUSION:** This study indicated that 12.5μg of fentanyl added to 2ml of 0.5% bupivacaine (H) (H) for subarchnoid block would markedly improve intraoperative anaesthesia, and reduced the demand for postoperative analgesic with good maternal satisfaction and foetal well-being.

**KEYWORDS**: subarchnoid block; Bupivacaine (H); lower segment caesarian section; spinal fentanyl; Postoperative analgesia.

**INTRODUCTION:** SAB is commonly employed for caesarean delivery. Currently it has become very popular because of addition of opioid to the local anaesthetic, for central neuraxial blockade which will provide better intraoperative analgesia & postoperative analgesia.[1]

Although spinal bupivacaine(H) alone offers blockade upto $T_4$ dermatome, a substantial number of parturients still experience some discomfort and require analgesic during caesarean delivery.[2] Addition of fentanyl not only improves intra-operative analgesia but it also extends to early post-operative period.[3-6]

Neuraxial administration of opioids along with local anaesthetics improves the quality of intraoperative analgesia and also provide postoperative pain relief for longer duration[7, 8]

SAB is often used for elective caesarean delivery. However, spinal bupivacaine (H) alone may be insufficient to provide complete analgesia despite the high sensory block. 13% of the parturients undergoing caesarean delivery had visceral pain even after the spinal administration of 15 mg of

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bupivacaine (H).[3,9] Furthermore, such high doses of Spinal bupivacaine(H) were associated with severe hypotention and delayed recovery of motor block.[10] Therefore smaller doses of bupivacaine(H) supplemented by spinal opioids have been recommended for SAB in parturients undergoing caesarean delivery.[2,5,6,7,11]

Spinal administration of lipophilic opioid such as fentanyl, after administration diffuses into epidural space and subsequently into the plasma, suggesting that spinal fentanyl act through spinal opioid receptors & systemically. Therefore fentanyl provides better intraoperative analgesia.[12]

This study was designed to evaluate the effects of spinally administered fentanyl (12.5 μg) on the onset and duration of bupivacaine (H) induced sensory and motor spinal block, quality of intraoperative surgical anaesthesia and requirements of analgesia during early postoperative period.

**METHODOLOGY:** A study of SAB with 0.5% hyperbaric bupivacaine (H) (10 mg) 2cc alone and combination of 0.5% hyperbaric bupivacaine (H) 10 mg (2cc) with 12.5μg fentanyl in parturients posted for elective or semiemergency caesarean section deliveries were conducted after obtaining institutional ethical committee clearence.

The study population consists of 90 parturients posted for elective or semiemergency caesarean section deliveries under subarchnoid block. They were divided into two groups, group BC and group FB consisting of 45 parturients in each group. They were in the age group of 18-35 years belonging to ASA Grade I and II physical status. Parturents belonging to ASA Grade III and IV physical status were excluded.

Routine investigations were carried out. The anaesthesia machine checklist and necessary drugs were kept ready. An intravenous line was secured with 18G IV cannula. Preloading was done with 0.5 Litre of Ringer's lactate over 15 minutes. Premedicated with inj metoclopromide 10 mg IV and Inj. Ranitidine 50 mg IV. Monitors were connected.

**METHODS:** Parturients were divided into two groups of 45 each.

Group BC received 0.5% hyperbaric bupivacaine (H) 10 mg (2 cc) + 0.25 ml of CSF (total volume 2.25ml) spinal.

Group FB received 0.5% hyperbaric bupivacaine (H) 10 mg (2 cc) + 0.25 ml i.e. 12.5 μgm of fentanyl (total volume 2.25 ml)) spinal.

All the parturients were assessed for:

1. Time of onset of sensory analgesia at $T_{10}$ segment.
2. The maximum level of sensory blockade achieved.
3. The time taken to achieve the maximum level of analgesia.
4. Degree of motor blockade (in Bromage score).
5. Duration of analgesia.
6. Duration when patient demand for rescue analgesia.
7. Cardiovascular status.
8. Any complications.

**OBSERVATIONS:** Group BC received 0.5% hyperbaric bupivacaine (H) 10 mg (2cc) + 0.25ml of CSF (total volume 2.25ml) intrathecally.

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Group FB received 0.5% hyperbaric bupivacaine(H) 10 mg (2cc) + 12.5μg of fentanyl (0.25ml) (total volume 2.25ml) intrathecally.

The following observations were made during the course of the study.

| | |
|---|---|
| Group BC | 24.75 ± 4.49 |
| Group FB | 24.10 ± 4.20 |
| Mean age (years) | |

$p > 0.05$ not significant

| | |
|---|---|
| Group BC | 62.5 ± 2.6 |
| Group FB | 61.9 ± 2.5 |
| Mean weight (kg) | |

$p > 0.05$ not significant

| Time of onset of analgesia at $T_{10}$ (minutes) | Group BC | | Group FB | |
|---|---|---|---|---|
| | No. of parturients | Percentage | No. of parturients | Percentage |
| 1-2 | 13 | 28.9 | 26 | 57.8 |
| 2-3 | 23 | 51.1 | 17 | 37.8 |
| 3-4 | 9 | 20 | 2 | 4.4 |
| **Total** | **45** | **100** | **45** | **100** |

Table 1: Time of onset of sensory analgesia

| | |
|---|---|
| Group BC | 2.46 ± 0.79 |
| Group FB | 1.9 ± 0.56 |
| Mean time of onset of analgesia (minutes) | |

The difference in the mean time between Group BC and Group FB was statistically significant ($p < 0.05$).

| Height of analgesia (highest level of analgesia) | Group BC | | Group FB | |
|---|---|---|---|---|
| | No. of partuients | Percentage | No. of parturients | Percentage |
| $T_3$ | 5 | 11.1 | 11 | 24.4 |
| $T_4$ | 25 | 55.6 | 29 | 64.4 |
| $T_5$ | 0 | 0 | 3 | 6.7 |
| $T_6$ | 15 | 33.3 | 2 | 4.4 |
| **Total** | **45** | **100** | **45** | **100** |

Table 2: Highest level of sensory analgesia

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| Time taken to achieve the highest level of sensory analgesia (minutes) | Group BC | | Group FB | |
|---|---|---|---|---|
| | No. of parturients | Percentage | No. of parturients | Percentage |
| 1-2 | 1 | 2.2 | 4 | 8.8 |
| 3-4 | 18 | 40.0 | 32 | 71.1 |
| 5-6 | 13 | 28.8 | 6 | 13.3 |
| 7-8 | 12 | 26.6 | 2 | 4.4 |
| 9-10 | 1 | 2.2 | 1 | 2.2 |
| **Total** | **45** | **100** | **45** | **100** |

Table 3: Time taken to achieve highest level of sensory analgesia

The mean time taken to achieve the highest level of sensory analgesia in Group BC was 5.3 ± 1.92minutes and the mean time taken to achieve the highest level of sensory analgesia in Group FB was 3.9 ± 1.63minutes ($p < 0.05$). The difference in the mean time between Group BC and Group FB was statistically significant ($p < 0.05$).

| Time taken to achieve the highest level of sensory analgesia (minutes) | Group BC | | | | Group FB | | | |
|---|---|---|---|---|---|---|---|---|
| | T3 | T4 | T5 | T6 | T3 | T4 | T5 | T6 |
| 1-2 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 0 |
| 3-4 | 1 | 12 | 0 | 5 | 9 | 18 | 3 | 2 |
| 5-6 | 2 | 7 | 0 | 4 | 1 | 5 | 0 | 0 |
| 7-8 | 2 | 4 | 0 | 6 | 0 | 2 | 0 | 0 |
| 9-10 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| **Total** | **5** | **25** | **0** | **15** | **11** | **29** | **3** | **2** |

Table 4: Maximal dermatomal level achieved and the time taken for achieving the maximal dermatomal level

| Time for two segment regression (minutes) | Group BC | | Group FB | |
|---|---|---|---|---|
| | No. of parturients | Percentage | No. of parturients | Percentage |
| 60-79 | 4 | 8.8 | 0 | 0 |
| 80-99 | 22 | 48.8 | 7 | 15.5 |
| 100-119 | 13 | 28.8 | 15 | 33.3 |
| 120-139 | 5 | 11.1 | 9 | 20.0 |
| 140-159 | 1 | 2.2 | 7 | 15.5 |
| 160-179 | 0 | 0.0 | 2 | 4.4 |
| 180-199 | 0 | 0.0 | 4 | 8.8 |
| 200-219 | 0 | 0.0 | 1 | 2.2 |
| **Total** | **45** | **100** | **45** | **100** |

Table 5: Time for two segment sensory regression

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| | |
|---|---|
| Group BC | 99.78 ± 17.69 |
| Group FB | 129.11 ± 31.26 |
| Mean time (minutes) | |

The difference in the mean-time taken for two segment sensory regression between Group BC and Group FB is statistically significant ($p < 0.05$).

| Time for sensory regression to $L_1$ (minutes) | Group BC | | Group FB | |
|---|---|---|---|---|
| | No. of parturients | Percentage | No. of parturients | Percentage |
| 100-149 | 6 | 13.3 | 0 | 0 |
| 150-199 | 29 | 64.4 | 2 | 4.4 |
| 200-249 | 9 | 20.0 | 8 | 17.7 |
| 250-299 | 1 | 2.2 | 22 | 48.8 |
| 300-349 | 0 | 0 | 13 | 28.8 |
| **Total** | **45** | **100** | **45** | **100** |

Table 6: Time for sensory regression to $L_1$

| | |
|---|---|
| Group BC | 179.44 ± 28.95 |
| Group FB | 271.44 ± 34.72 |
| Mean time (minutes) | |

The difference in the mean value between Group BC and Group FB is statistically highly significant ($p < 0.05$).

| Time for complete sensory recovery (minutes) | Group BC | | Group FB | |
|---|---|---|---|---|
| | No. of parturients | Percentage | No. of parturients | Percentage |
| 110-159 | 7 | 15.5 | 0 | 0 |
| 160-209 | 32 | 71.1 | 1 | 2.2 |
| 210-259 | 5 | 11.1 | 11 | 24.4 |
| 260-309 | 1 | 2.2 | 27 | 60.0 |
| 310-359 | 0 | 0 | 6 | 13.3 |
| **Total** | **45** | **100** | **45** | **100** |

Table 7: Time for complete sensory recovery

| | |
|---|---|
| Group BC | 185.0 ± 29.8 |
| Group FB | 277.2 ± 33.3 |
| Mean time (minutes) | |

The difference in the mean time between Group BC and Group FB is statistically significant ($p < 0.05$).

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| Time of onset of grade III motor block (minutes) | Group BC | | Group FB | |
|---|---|---|---|---|
| | No. of parturients | Percentage | No. of parturients | Percentage |
| 1-2 | 11 | 24.4 | 21 | 46.7 |
| 3-4 | 32 | 71.1 | 23 | 51.1 |
| 5-6 | 2 | 4.4 | 1 | 2.2 |
| **Total** | **45** | **100** | **45** | **100** |

Table 8: Time of onset of Grade III motor block

| | |
|---|---|
| Group BC | 3.1 ± 0.88 |
| Group FB | 2.6 ± 0.8 |
| Mean time (minutes) | |

The mean time is 2.6 ± 0.8 minutes ($p > 0.05$).

| Total duration of Grade III motor block (minutes) | Group BC | | Group FB | |
|---|---|---|---|---|
| | No. of parturients | Percentage | No. of parturients | Percentage |
| 90-119 | 26 | 57.8 | 18 | 40.0 |
| 120-149 | 18 | 40.0 | 13 | 28.9 |
| 150-179 | 0 | 0 | 6 | 13.3 |
| 180-209 | 1 | 2.2 | 8 | 17.8 |
| **Total** | **45** | **100** | **45** | **100** |

Table 9: Total duration of Grade III motor block

| | |
|---|---|
| Group BC | 119 ± 18.5 |
| Group FB | 137 ± 33.4 |
| Mean time (minutes) | |

The difference in the mean-time of total duration of motor block in Group BC and Group FB was statistically significant ($p < 0.05$).

| Total duration of analgesia (minutes) | Group BC | | Group FB | |
|---|---|---|---|---|
| | No. of parturients | Percentage | No. of parturients | Percentage |
| 90-139 | 7 | 15.6 | 0 | 0 |
| 140-189 | 5 | 11.1 | 7 | 15.6 |
| 190-239 | 32 | 71.1 | 2 | 4.4 |
| 240-289 | 1 | 2.2 | 31 | 68.9 |
| 290-339 | 0 | 0 | 4 | 8.9 |
| 340-389 | 0 | 0 | 1 | 2.2 |
| **Total** | **45** | **100** | **45** | **100** |

Table 10: Total duration of analgesia

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| | |
|---|---|
| Group BC | 165.0 ± 29.8 |
| Group FB | 259.4 ± 35.3 |
| Mean time (minutes) | |

$p < 0.05$, significant (S)

The mean difference between two groups is statistically significant.

| APGAR score | Group BC | Group FB |
|---|---|---|
| 1 min | 7-9 | 7-9 |
| 5 min | 10 | 10 |
| APGAR at 1 and 5 min interval | | |

No significant differences observed between two groups.

| Groups | | Mean pulse rate at various time intervals (beats per minute) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pre | 2 | 6 | 10 | 30 | 90 | 180 | 270 |
| Group BC | Mean | 93.4±16.1 | 89.2±18.5 | 87.2±13.7 | 88.1±14.6 | 87.1±11.1 | 88.9±13.5 | 86.5±7.6 | 86.2±6.7 |
| Group FB | Mean | 93.2±15.1 | 89.0±17.6 | 90.0±14.7 | 87.8±13.1 | 88.0±10.9 | 89.0±12.4 | 88.0±7.1 | 88.1±6.9 |
| Table 11: Cardiovascular parameter | | | | | | | | | |

| Groups | | Mean arterial pressure at various time intervals (mmHg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pre | 2 | 6 | 10 | 30 | 90 | 180 | 270 |
| Group BC | Mean | 94.1±6.6 | 87.9±9.5 | 83.5±10.1 | 82.3±12.1 | 85.4±6.7 | 90.4±6.8 | 92.1±5.7 | 93.6±5.5 |
| Group FB | Mean | 94.4±6.2 | 82.9±11.8 | 81.3±9.9 | 85.1±10.4 | 87.4±7.9 | 89.1±8.3 | 90.5±5.5 | 92.7±5.2 |

There were no significant haemodynamic alterations in cardiovascular parameters.

| Complication | Group BC | | Group FB | | p-value | Inference |
|---|---|---|---|---|---|---|
| | No. of parturients | % | No. of parturients | % | | |
| Hypotension | 18 | 40 | 20 | 44.4 | | |
| Bradycardia | 5 | 11.1 | 4 | 8.8 | | |
| Nausea and vomiting | 8 | 17.8 | 6 | 13.3 | < 0.05 | Significant |
| Respiratory depression | 0 | 0 | 0 | 0 | | |
| Shivering | 9 | 20.0 | 3 | 6.7 | < 0.05 | Significant |
| Pruritus | 0 | 0 | 3 | 6.7 | | |
| PDPH and neurological complication | 0 | 0 | 0 | 0 | | |
| Foetal bradycardia | 0 | 0 | 0 | 0 | | |
| Table 12: Complications during anaesthesia | | | | | | |

$p < 0.05$ which is statistically significant.

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**DISCUSSION:** Fentanyl is more lipid soluble than morphine which is more readily eliminated from the CSF than morphine making respiratory depression less likely.

Advantage of using spinal fentanyl is its extremely rapid onset of action, desired level of analgesia and anaesthesia with minimum dosage of fentanyl as well as bupivacaine (H).

Epidurally administered fentanyl in doses of 50-100 μg has been shown to provide postoperative analgesia of 3-4 hour duration.[8] This was similar to duration of analgesia following 12.5μg doses of spinal fentanyl.

Results of this study showed that fentanyl 12.5μg prolongs the duration of bupivacaine (H) induced sensory blockade (sensory regression to $L_1$ dermatome). This suggests a potential synergism between fentanyl and bupivacaine (H).

Onset of sensory analgesia was achieved between 2-3 minutes in Group BC (51.1%) i.e. bupivacaine (H) only and 28.9% of parturients of same group achieved between 1-2 minutes. In Group FB, i.e. bupivacaine (H) and fentanyl group 57.8% of the parturients achieved the sensory block between 1-2 minutes and 37.8% of parturients achieved between 2-3 minutes. The mean time of onset of analgesia at $T_{10}$ in Group BC is $2.46 \pm 0.79$ and in Group FB is $1.9 \pm 0.56$. The difference in the mean time between two groups is statistically significant ($p < 0.05$).

Majority of the parturients in both the groups achieved the highest sensory level of $T_4$. The highest sensory level range was $T_4$ in both Group BC and Group FB.

The time taken to achieve highest sensory level in Group BC in 95.6% of parturients was between 3-8 minutes whereas in Group FB in 93.4% of the parturients this was achieved between 1-6 minutes.

The mean time in Group BC was $5.3 \pm 1.92$minutes and in Group FB was $3.9 \pm 1.63$minutes ($p < 0.05$) which was statistically significant.

In B N Biswas et al.[13] study highest sensory level (range) in Group A, i.e. bupivacaine alone was $T_7$ ($T_6$-$T_8$) and in Group B, i.e. with fentanyl it was $T_5$ ($T_4$-$T_6$). Mean time taken to achieve this level in Group A was $8 \pm 2.1$minutes and $7 \pm 2.4$minutes in Group B.

According to Catherine O' Hunt et al.[7] (1989) the onset time to $T_4$ in Group O i.e. bupivacaine alone is $4.571 \pm 2.76$minutes and in Group with fentanyl the mean time of onset was $4.222 \pm 2.108$minutes.

The results of the present study concurs with the findings of the above authors.

The difference in the mean time between Group BC and Group FB is statistically significant ($p < 0.05$). Time for two segment regression was prolonged with the addition of fentanyl to bupivacaine (H).

According to Catherine O'Hunt et al.[7] (1989) the time for two segment regression was prolonged in fentanyl with bupivacaine group. They observed the number of segment regressed in 60 minutes in Group O, i.e. bupivacaine alone was $2.5 \pm 2.588$ segments and in group 12.5 μg fentanyl is $0.75 \pm 1.389$ segments.

According to Harbhej Singh et al.[14] (1995) the time taken for two segment regression was prolonged in fentanyl with bupivacaine group. In Group I, i.e. bupivacaine alone time for two segment regression from the highest sensory level was $74 \pm 18$ minutes and in Group II, i.e. with fentanyl it was $93 \pm 22$ minutes, it was statistically significant. So our study concurs with findings of the above authors. Similar results were noticed with Uma Srivastava et al.[1] Belzarena Sergio et al[3] and Benhamou Dan et al.[15]

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Time for sensory regression to $L_1$ in Group BC, the maximum time was 260 minutes and minimum time was 100 minutes, the mean time was 179.44 ± 28.95 minutes. In Group FB the maximum time was 340 minutes and minimum time was 180 mins and the mean time was 271.44 ± 34.72 minutes. The difference in the mean-time value between Group BC and Group FB was statistically significant ($p < 0.05$). Similar results were noticed with B N Biswas et al.[13], Harbhej Singh et al.[14] and Catherine O'Hunt et al.[7]

They observed sensory regression to $L_1$ in Group I, i.e. bupivacaine alone was 116 ± 14.39 minutes and in Group II, i.e. with fentanyl combination it was 151 ± 7.33 minutes and it was statistically significant in their studies. However it was found that time for sensory regression to $L_1$ was prolonged with fentanyl. Our study concurs with the results of the above authors.

The maximum time for complete sensory recovery in Group BC, was 260 minutes and the minimum time was 110 minutes and the mean time was 185.0 ± 29.8 minutes. In Group FB the maximum time for complete sensory recovery was 340 minutes and minimum time was 180 minutes and the mean time was 277.2 ± 33.2 minutes. The difference in mean time between Group BC and Group FB was statistically significant ($p < 0.05$). The time for complete sensory recovery was prolonged in Group FB when compared to Group BC.

According to B N Biswas et al.[13] in their studies the mean time taken for complete sensory recovery was 129 ± 9.5 minutes in bupivacaine alone group and 183 ± 9 minutes in the fentanyl with bupivacaine group which was statistically significant. Complete analgesia lasted longer in fentanyl group compared to bupivacaine alone group. Our study concurs with the study of B N Biswas et al.[13] Similar results were obtained with Belzarena et al.[3] (1991) and Harbhej Singh et al.[14] (1995).

In the present study by adding 12.5μg of fentanyl to 10mg (2cc) of bupivacaine(H) the time of onset of grade III motor block was not statistically significant ($p > 0.05$) in both groups. The mean time of onset of grade III motor block in Group BC was 3.1 ± 0.88 minutes and in Group FB, was 2.6 ± 0.8 minutes. The addition of fentanyl to bupivacaine (H) did not affect the onset of motor block. Similar results were noticed in the studies conducted by the authors B N Biswas et al. (2002),[13] Harbhej Singh et al. (1995).[14]

So our study concurs with the study of above authors.

The mean time for complete motor recovery was 119 ± 18.5 minutes in Group BC and 137 ± 33.4 minutes in Group FB. B N Biswas et al.[13] observed complete motor recovery of 125 ± 6.7 minutes in Group I, i.e. bupivacaine alone and 127 ± 7.1 minutes in fentanyl with bupivacaine group. Similar results were noticed with Harbhej Singh et al.[14] study i.e. 151 ± 46 minutes in Group I and 169 ± 37 minutes in Group II, but results of above studies were statistically not significant. The results of our study were more or less similar to above studies.

The mean time of total duration of analgesia was 165 ± 29.8 minutes in Group BC and 259.4±35.3 minutes in Group FB. This difference in the mean time between Group BC and Group FB was statistically significant ($p < 0.05$). The total duration of analgesia was prolonged with the addition of fentanyl in our study. Results of our study concur with the results of studies done by B N Biswas et al.[13]

In their study the duration of analgesia was prolonged in Group B (Fentanyl 12.5μg) i.e. 248 ± 11.76 minutes. In Group A Bupivacaine (10 mg) the duration of analgesia was 150 ± 10.48 minutes. Catherine O'Hunt et al.,[7] in their study the duration of analgesia was 192 ± 74.9 minutes in fentanyl

6.25 μg Group whereas in control group (bupivacaine (H) alone) 71.8 ± 43.2 minutes. Similarly, results of our study also concur with studies done by Herbhej Singh et al, Belzarena Sergio et al. (1991) and Uma Srivastava et al.

**CONCLUSION:** The addition of 12.5μg of fentanyl to 2ml (10mg) of bupivacaine (H) definitely intensified and prolonged the duration of bupivacaine (H) induced sensory SAB without affecting the onset and intensity of motor blockade.

Combination of fentanyl to bupivacaine (H) can be safely employed for parturients who undergo caesarean section without significant haemodynamic changes and adverse effects. Hence we recommended to add 12.5μg of fentanyl to 0.5% bupivacaine (H) for SAB in caesarean section deliveries. It would markedly improve intraoperative anaesthesia, and significantly reduce the demand for postoperative analgesic with good maternal satisfaction and foetal well-being.

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