

Comparision of analgesic effects of clonidine versus fentanyl as adjuvants to intrathecal isobaric Levobupivacaine for vaginal hysterectomy: randomised double blind interventional study, SMS Hospital, Jaipur, Rajasthan During 2018-2020

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Abstract

Background: To assess and compare the analgesic effect of intrathecal Clonidine versus Fentanyl as an adjuvant to intrathecal isobaric Levobupivacaine in Vaginal hysterectomy

Methods- This study was conducted in Sawai Man Singh Medical College and Attached Group of Hospitals (Zanana Hospital), Jaipur. 60 eligible patients, age ranging between 30-75 years, belonging to ASA grade 1 and II, scheduled to undergo vaginal hysterectomy were chosen randomly and pre-anaesthetic checkups was done on day before surgery. Informed consent was obtained from each patient.

Results: VAS score and rescue analgesic was given at VAS Score ≥ 3 . None of the patients experienced pain in group A and group B up to 60 minutes postoperatively. The Difference in mean VAS score was higher in group A as compared to group B at (90-360 mins), as P value <0.001 which was statistically significant as P value <0.001 .

Conclusion: Though onset of sensory and motor block was faster with fentanyl. Clonidine (30 micro gm) as adjuvant to intrathecal bupivacaine is better analgesic than fentanyl (25micro gm) with intrathecal isobaric Levobupivacaine, as it provides longer duration of sensory and motor block and prolong duration of first rescue analgesia

Keywords: VAS, Fentanyl, Clonidine

Introduction

Pain as defined by the International Association for the study of Pain (IASP) is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”.⁽¹⁾ Pain in the post-operative period is one of the major factors that impede recovery from anesthesia and surgery. Pain is frequently the result of nociception; an activity in the nervous system that results from the stimulation of nociceptors⁽²⁾ This activity is carried to the brain, usually via the spinal cord, without conscious awareness, about damage or near –damage in body tissues. Pain is the

conscious experience of sensorial information and a feeling of unpleasantness that manifests as a result of nociception. Relief of pain during surgery is the raison d'être of anesthesia. Any expertise acquired in this field should be extended into postoperative period.

This study is designed to compare the analgesic effect of intrathecal fentanyl vs clonidine with isobaric Levobupivacaine duration of analgesia, onset and duration of sensory and motor block, sedation and to evaluate the side effects, if any in vaginal hysterectomy.

Material and Methods

Study Area: The study was conducted in the Department of Anaesthesiology, Sawai Man Singh Medical College and Attached Group of Hospitals (Zanana Hospital), Jaipur after the approval of local institutional ethical committee and obtaining written informed consent from all patients before participation.

Study Design

Hospital based, Prospective, randomized, double blinded, interventional study in two groups of patients.

Study Group

The study was conducted in following two groups of patients. Each group was consist of 30 patients (n =30/group).

Fentanyl Group (Group A): Patients received 3 ml of 0.5% isobaric Levobupivacaine + 0.5 ml of (25 mcg) of fentanyl intrathecally. (Total volume 3.5ml)

Clonidine Group (Group B): Patients received 3 ml of 0.5% isobaric Levobupivacaine + 0.2ml (30mcg) of clonidine +0.3 ml Normal saline intrathecally. (Total volume 3.5ml)

Inclusion Criteria

- Age group between 30 and 75 years.
- ASA grade I & II.
- Body weight 45 to 85 kg.

- Undergoing total vaginal hysterectomy

Exclusion Criteria

- Patients not willing to participate in the study.
- Cases with sepsis, bacteremia or skin infection of local site.
- History of severe hypovolemia, anemia and compromised renal, cardiac or respiratory status.
- Cases with raised intracranial tension.
- History of blood coagulopathies.
- Patient allergic to drugs used for study.
- Uncooperative patients.
- Failure of spinal anesthesia, cases in which general anaesthesia will be required.

Statistical Analysis

- The quantitative data will be expressed in mean \pm S.D.
- Chi-square test will be used to find out significance of different of proportion
- Unpaired t-test will be used to find out the difference in means.

For significance, following at the level of P value will be taken:

- $P > 0.05$ = not significant
- $P = 0.05$ = just significant
- $P < 0.05$ = significant
- $P < 0.001$ = highly significant.

All the statistical analysis of data was done with statistical programming software – SPSS (Statistical Package for the Social Science) version 20.0.0 (SPSS Inc., Chicago, Illinois, USA).

The categorical variables (qualitative data) like ASA grade, sedation score, and success rate were presented in frequency and percentage and were analyzed with Chi-Square test (for nominal data), Kruskal-Wallis test (for

ordinal data). A p value of less than 0.05 was considered statistically significant in all the analysis.

Results

Table 1: Demographic profile

Variable	Group-A	Group-B	P-value
Age in yrs	55.50±10.64	53.63±8.28	0.451
Weight in kgs	60.23±4.34	58.63±9.16	0.390
ASA (I:II)	26:4	27:3	0.687
Mean duration of surgery in mint.	63.10 ±13.77	64.13±13.81	0.321
Mean time of onset of sensory block(mins)	5.67±1.06	6.93±1.36	0.001
Mean time to reach maximum sensory block(mins)	8.31±1.56	12.66±1.26	0.001
Mean of total duration of sensory block(mins)	253±23.51	296±29.52	0.001
Mean time of onset of motor block	8.80±0.85	9.37±1.00	0.021
Mean of duration of motor block (mins)	210±20.0	288±28.82	0.01

The mean age of the patients in group A was 55.50±10.64 and in group B 53.63±8.28 .The difference in the mean age among the two groups was comparable as p value is 0.451. The mean weight of patients in group A was 60.23±4.34 (kgs) and the mean weight of group B was 58.63±9.16 (kgs) . The difference in the mean weight of the patients among the groups was comparable as p value is 0.390. In group A and group B 86.67% and 90% patient were of ASA grade 1 respectively and In group A and groupB 13.33% and 10% patient were of ASA grade 2 respectively. Mean duration of surgery in patients of group A was 63.10 ±13.77 (mins) and the mean duration of surgery in patients of group B was 64.13±13.81 (mins). Mean time of onset of sensory block was

5.67±1.06 mins in group A and 6.93±1.36 mins. In group B. As shown in above table difference in mean time of onset of sensory block was statistically significant. (p value=.0001). Mean time to reach maximum sensory block was 8.31±1.56 mins in group A and 12.66±1.26 mins. In group B. Mean of total duration of sensory block was 253±23.51 mins in group A and 296±29.52 mins. in group B. Mean time of onset of motor block in group A was 8.80±0.85(mins)in group A and in group B it was 9.37±1.00 (mins). Mean of duration of motor block in group A was 210±20.0 (mins) and in group B was 288±28.82 (mins).The Difference was statistically significant (p value 0.001).

Table 2: Comparison of Vas Score among Study Group

	Group A		Group B		P value
	Mean	SD	Mean	SD	
0 min	0	0.00	0.00	0.00	-
30 min	0	0.00	0.00	0.00	-
60 min	0	0.00	0.00	0.00	-
90 min	0.5	0.51	0.00	0.00	P<0.001 (S)

120 min	1.06	0.37	0.27	0.45	P<0.001 (S)
150 min	1.93	0.37	0.80	0.71	P<0.001 (S)
180 min	2.16	0.38	1.23	0.50	P<0.001 (S)
210 min	2.36	0.49	1.53	0.51	P<0.001 (S)
240 min	2.73	0.45	1.97	0.32	P<0.001 (S)
270 min	2.93	0.25	2.33	0.48	P<0.001 (S)
300 min	2.96	0.18	2.47	0.51	P<0.001 (S)
360 min	3.06	0.25	2.47	0.57	P<0.001 (S)

Above table shows comparison of VAS score and rescue analgesic was given at VAS Score ≥ 3 . None of the patients experienced pain in group A and group B up to 60 minutes postoperatively. The Difference in mean VAS

score was higher in group A as compared to group B at (90-360 mins), as P value <0.001 which was statistically significant as P value <0.001.

Table 3: Mean of Sedation Score

	Group A		Group B		P value
	Mean	SD	Mean	SD	
0 min	1.16	0.38	1.46	0.61	P<0.05
30 min	1.16	0.37	1.37	0.60	P<0.05
60 min	1.03	0.18	1.27	0.52	P<0.05
90 min	1	0.00	1.23	0.43	P<0.05
120 min	1	0.00	1	0.00	-
150 min	1	0.00	1	0.00	-
180 min	1	0.00	1	0.00	-
210 min	1	0.00	1	0.00	-
240 min	1	0.00	1	0.00	-
300 min	1	0.00	1	0.00	-
360 min	1.00	0.00	1.00	0.00	-

Data expressed as mean \pm S.D. P<0.05 is significant

Mean sedation score at 0 to 90 mins, which was higher in group as compared to group B postoperatively and difference was statistically significant at that time interval.

Discussion

Spinal anaesthesia using local anaesthetics is a rapid onset and effective sensory and motor blockade

technique for infra umbilical surgeries including vaginal hysterectomy and spinal anaesthesia remains a preferred technique for such surgery.

Local anaesthetics block voltage-gated sodium channels thereby interrupting the initiation and propagation of nerve impulses in axons. It has been well documented that a combination of local anaesthetics with fetanyl and

clonidine has a synergistic analgesic effect when administered intrathecally.

Various studies^{4,5} reported that addition of fentanyl to Local Anaesthetics improves anaesthesia quality and prolongs postoperative analgesia without prolonging motor block.

Various studies also reported that addition of clonidine to Local anaesthetics significantly prolonged post-op analgesia with an effect on sedation, heart rate and MAP which does not require any therapeutic intervention.

Levobupivacaine, the pure levoisomer of racemic bupivacaine which has almost similar efficacy but an enhanced safety profile is currently being investigated for spinal anaesthesia.

Only few studies were available which compared the analgesic effect of fentanyl verses clonidine with levobupivacaine in spinal anesthesia, till the planning of this study.

The mean time of onset of sensory block to reach T₁₀ level was 5.67±1.06 mins in group A and 6.93±1.36 mins. in group B. Mean time of onset of sensory block was earlier in (fentanyl) group A as compared to (clonidine) group B. This was statistically significant as p value was 0.0001.

Results of this study was contrary with the results of study done by **Archana Agarwal et al.** They found that onset of sensory block was earlier in fentanyl group as compared to clonidine group, but it was statistically not significant. This might be because of lower doses of fentanyl and levobupivacaine used by them.

In our study time the mean time to reach maximum sensory block was 8.31±1.56 mins in group A and 12.66±1.26 mins in group B. Mean time to reach maximum sensory block was earlier in (fentanyl) group

A as compared to (clonidine) group B. Difference was statistically significant (p value=0.000).

Results of this study were contrary with results of study done by **Archana Agarwal et al.** They also found that mean time to reach maximum sensory block was earlier in fentanyl as compared to clonidine, but it was not statistically significant. This might be because of lower doses of fentanyl and levobupivacaine used by them.

Duration of Sensory Block In fentanyl group (Group A) the mean duration of sensory block was 253 ±23.51 minutes while in clonidine group (Group B) it was 296 ± 29.52 minutes. There was statistically significant difference in duration of sensory block (p value=0.000).

Result of this study is supported by the findings of study done by **Archana Agarwal et al.** they also reported that intrathecal clonidine significantly prolongs the mean duration of sensory block compared to intrathecal fentanyl.

Similarly Ahmed F. et al. conducted study to compare the effect of clonidine, fentanyl, and combination of both as adjuvant to intrathecal hyperbaric bupivacaine for postoperative analgesia in total abdominal hysterectomy. They also found that duration of sensory block was less in fentanyl group as compared to clonidine group, but it was statistically significant.

The mean time of onset of motor block in group A was 8.80±0.85 minutes and in group B was 9.37 ± 1.00 minutes. The mean time of onset of motor block was earlier in (fentanyl) group A as compared to (clonidine) group B. It was statistically significant as p value=0.021.

Results of this study coincide with the results of study done by **Archana Agarwal et al.** They also found that mean time onset of motor block was earlier in fentanyl as compared to clonidine, but was not significant.

Duration of motor block was 210 ± 20.00 minutes in group A while in group B the mean duration of motor block was 288 ± 28.82 minutes. There was statistically significant difference in duration of motor block as $P < 0.001$.

Result of this study is supported by the findings of study done by **Archana Agarwal et al** They also reported that intrathecal clonidine significantly prolongs the mean duration of motor block as compared to intrathecal fentanyl.

None of the patients experienced pain in both the groups up to 60 minutes postoperatively. Difference in mean VAS score was significantly higher in group A as compared to group B at, 90, 120, 150, 180, 210, 240, and 270, 300. And 360 minutes postoperatively. As P value < 0.05 at all interval which was statistically significant.

We observed that VAS score was significantly higher in group A (fentanyl) as compared to group B (clonidine) for 300 mins post operatively.

Our observations are consistent with previous studies conducted by **Archana Agarwal et al** they also found that vas score was significantly less in clonidine group as compared to fentanyl group.

Conclusion

Though onset of sensory and motor block was faster with fentanyl. Clonidine (30 micro gm) as adjuvant to intrathecal bupivacaine is better analgesic than fentanyl (25micro gm) with intrathecal isobaric levo-bupivacaine, as it provides longer duration of sensory and motor block and prolong duration of first rescue analgesia

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