Original Research Paper

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COMPARISON OF COMBINED SPINAL EPIDURAL ANALGESIA WITH EPIDURAL ANALGESIA USING FENTANYL- BUPIVACAINE COMBINATION FOR EFFECTIVE LABOUR ANALGESIA

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ABSTRACT

BACKGROUND : Labour results in severe pain for most women. When pain relief is available, the vast majority of women request and receive analgesic medication for the treatment of labour pain. The ideal labour analgesic technique should dramatically reduce the pain of labour, while allowing the parturient to actively participate in the birthing experience. In addition, it should have minimal effect on the foetus or the progress of labour. Of all the possible methods of pain relief which can be used in labour, neuraxial blockade (epidural, spinal, CSE, continuous spinal) provides the most effective and least depressant analgesia. Combination of low dose of local anaesthetics and opioid dramatically reduce the incidence of lower limb motor blockade, enabling mothers to walk, sit or stand upright.

AIM

- To compare combined spinal epidural analgesia with conventional epidural analgesia using fentanyl-bupivacaine in alleviating labour pain.
- To study their effects on the mother and the fetus.
- To study their effects on progress of labour and delivery

METHODS: Parturients with no antenatal risk factors and expected to have normal vaginal delivery were eligible to be included in the study. Women with known cardiac disease, gestational hypertension, epilepsy or known psychiatric disorder were excluded, as were parturients with multifetal pregnancy, suspected cephalopelvic disproportion and those who have had previous caesarean section.

MATERIALS USED: For initiating epidural block, the following were kept ready:- Draping towels and sponge holding forceps, sterile gauze pieces in kidney tray, bowls with antiseptic solution, 18 G Tuohy needle with 20 G portex epidural catheter with filter and loss of resistance syringe for single use, 2 ml syringe with 24 G needle for local anaesthetic infiltration, 5 ml and 10ml syringe with needles to draw up fentanyl and bupivacaine respectively, Inj. Bupivacaine – 0.25% preservative free vial, Inj.Lignocaine – 2% vial, Inj. Fentanyl ampoules, distilled water, saline and metal files to open ampoules, delivery tray, baby resuscitation tray and waterproof adhesive plasters. For initiating combined spinal epidural block in addition to above 27 G Quincke needle was kept ready.

CONCLUSION: Combined spinal epidural analgesia with fentanyl – bupivacaine combination is thus a safe and better alternative to EA as a technique of neuraxial block for effective labour analgesia.

KEYWORDS :

INTRODUCTION

"All pain is per se and especially in excess, destructive and ultimately fatal in its nature and effects."
James Young Simpson (1811 – 1870)

Labour results in severe pain for many women. There is no other circumstance where it is considered acceptable for a person to experience untreated severe pain, amenable to safe intervention, while under a physician's care. Maternal request is a sufficient medical indication for pain relief during labour. The ideal labour analgesic technique should dramatically reduce the pain of labour, while allowing the parturient to actively participate in the birthing experience. In addition, it should have minimal effect on the foetus or the progress of labour.

Of all the possible methods of pain relief which can be used in labour,

neuraxial blockade (epidural, spinal, CSE, continuous spinal) provides themost effective and least depressant analgesia. Epidural analgesia via a catheter technique provides excellent pain relief and the ability to extend the duration of the block to match the duration of labour, but it is not "instant" in onset and may be associated with motor block. One-shot spinal analgesia using a lipid soluble opioid is rapid and simple, but is associated with a limited duration of action. The combination of epidural and spinal anaesthesia into one technique, termed "CSE" provides the advantages of a spinal (speed of onset, lack of motor block) with the additional flexibility of renewal with an epidural catheter. Combination of low dose of local anaesthetics and opioid dramatically reduce the incidence of lower limb motor blockade, enabling mothers to walk, sit or stand upright. This was impossible with traditional epidurals using high intermittent boluses of 0.25% bupivacaine which cause a high incidence of motor block in the legs.

STUDY INTERVENTION:

The study involved 75 parturients in active labour with term gestation, belonging to ASA I class with singleton pregnancies with vertex presentation and no cephalo-pelvic disproportion. 75 cases were selected at random and grouped into 25 in the combined spinal epidural analgesia group (CSEA), 25 in the epidural analgesia group (EA) and 25 in the control group Each group in turn included 12 primigravida and 13 multigravidae. The above sub-grouping was done as the primi and multigravidae behave entirely different in the labour process and progress. All the study groups were well matched in terms of age, height, weight, parity and labour characteristics.

Inclusion Criteria

- ASA Status I & II
- Females in the age group from 18 to 30 years
- Adequate gynaecoid pelvis
- Cervical dilatation less than 4 cm

Exclusion Criteria :

Parturient with cardiac or respiratory diseases, spinal deformities, local skin sepsis, coagulopathies, parturients who have received systemic opioids early in labour, parturient refusal, preeclampsia, anaemia complicating pregnancy, multiple gestation, breech presentation, previous caesarean section and known H/O allergy to local anaesthetics and / or fentanyl.

Monitoring

1. Blood pressure every 2 minutes for the first 15 minutes after giving loading dose and then every 10 minutes.
2. Continuous maternal and foetal heart rate and maternal SpO2 monitoring
3. Continues verbal communication with the parturient in order to assess pain relief.
4. The time of onset of analgesia was noted. Parturients were asked to mark a point on the 10 point linear visual analogue scale(VAS) every 15 minutes to evaluate the adequacy of pain relief which was graded by Elbaz 1984. If VAS score was >4, it was considered to be breakthrough pain and additional epidural top up dose was given as mentioned earlier.

5. The level of sensory analgesia and intensity of motor blockade were assessed at half hourly intervals.

Motor block : Bromage scale (BONICA – 1995)

0 - No block (10%) - Full flexion of knees and feet possible
1 - Partial (33%) - Just able to flex knees, still full flexion of feet possible.
2 - Almost complete (66%) – Unable to flex knees, still full flexion of feet possible
3 - Complete - Unable to move legs or feet

6. The total dose of bupivacaine and fentanyl administered were noted in each group.
7. Complications : Pruritis, sedation, urinary retention, nausea, vomiting, shivering, headache, backache, hypotension, bradycardia and respiratorydepression were noted.

Sedation score: Grading of Nausea:

0 - Fully awake and oriented 0 - None
1 - Normal sleep 1 - Mild
2 - Drowsy, arousable on touch or call 2 - Moderate
3 - Drowsy, arousable on painful stimulus 3 - Severe
4 - Somnolent, difficult to arouse

The following obstetric parameters were noted

1. Duration and frequency of uterine contractions recorded every 15minutes.
2. Rate of cervical dilatation and progress of labour.
3. Duration of first, second and third stages of labour.
4. Mode of delivery.
5. Apgar score.

Any sign of maternal or foetal distress were taken as an indication for early termination of labour.

As the baby is born, APGAR score as noted and neonatal outcome was recorded by the paediatrician.

OBSERVATION AND RESULTS

AGE DISTRIBUTION:

Category	Age in years				
	CSEA		EA		'p'
	Mean	S.D.	Mean	S.D.	
Primi	22.58	2.19	22.08	2.39	0.5799 Not significant
Multi	25.15	3.8	25.85	2.85	0.518 Not significant

Category	Age in years				
	CSEA		CONTROL		'p'
	Mean	S.D.	Mean	S.D.	
Primi	22.58	2.19	23.16	3.30	0.5801 Not significant
Multi	25.15	3.8	25.72	3.38	0.522 Not significant

Category	Age in years				
	EA		CONTROL		'p'
	Mean	S.D.	Mean	S.D.	
Primi	22.08	2.39	23.16	3.30	0.6123 Not significant
Multi	25.85	2.85	25.72	3.38	0.5231 Not significant

Primi

Analyzing the age of the parturient in the combined spinal epidural group primi group was in the range of 19 to 26 years with a mean age group of 22.58 (2.19) years. In the epidural group primi group was in the range of 18 to 26 years with a mean age group of 22.08 (2.39) years.

The control group primi age was in the range of 18 yo 30 years with mean score of 23.16 (3.30) years. Multi In the CSEA group the multi group was in the range of 18 to 32 years with a mean age group of 25.15 (3.8) years. In the EA group multi was in the range of 20 to 31 years with a mean age group of 25.85 (2.85) years. Both the CSEA and the EA group were comparable with respect to age. In the control group multi range fell between 19 to 35 tears with an average mean of 25.72 (3.38) years. The control group was comparable to both the study groups with respect to age and the difference was statistically insignificant.

HEIGHT, WEIGHT CHARACTERISTICS:

Parameter	CSEA		EA		'p'
	Mean	S.D.	Mean	S.D.	
Height (in cms)					
Primi	152.67	5.91	154.33	5.42	0.2123 (Not significant)
Multi	153.38	6.09	154.69	4.4	0.4241(Not significant)
Weight (in kgs)					
Primi	55.75	10.91	56.33	10.85	0.8848 (Not significant)
Multi	61.69	7.17	62.15	7.85	0.8357(Not significant)

Parameter	CSEA		CONTROL		'p'
	Mean	S.D.	Mean	S.D.	
Height (in cms)					
Primi	152.67	5.91	151.80	6.6	0.4217(Not significant)
Multi	153.38	6.09	153.04	4.64	0.6721(Not significant)
Weight (in kgs)					
Primi	55.75	10.91	55.52	4.37	0.8912 (Not significant)
Multi	61.69	7.17	54.68	6.13	0.2017(Not significant)

Parameter	EA		CONTROL		'p'
	Mean	S.D.	Mean	S.D.	
Height (in cms)					
Primi	154.33	5.42	151.80	6.6	0.1821(Not significant)
Multi	154.69	4.40	153.04	4.64	0.4210(Not significant)
Weight (in kgs)					
Primi	56.33	10.85	55.52	4.37	0.7612(Not significant)
Multi	62.15	7.85	54.68	6.13	0.0714(Not significant)

Primi

In the CSEA group the mean height in the primi group was 152.67 (5.91) cm and the mean weight was 55.75 (10.91) kgs. In the epidural group the mean height in the primi group was 154.33 (5.42) cm and the mean weight was 56.33 (10.85) kgs. In the control group the mean height in the primi group was 151.8(6.6) cm and the mean weight was 55.52(4.37) kgs. Multi In the CSEA group among multi mean height and weight were 153.38 (6.09) cm and 61.69 (7.17) kgs respectively whereas in the EA group it was 154.69 (4.4) cm and 62.15 (7.85) kgs respectively and in the control group it was 153.04(4.64) cm and 54.68(6.13) kgs respectively. Both the CSEA and EA groups were comparable with respect to height and weight. The study and control groups were comparable with respect to height and weight and the difference was statistically insignificant.

RATE OF CERVICAL DILATATION:

Primi:

The mean rate of cervical dilatation per hour in the primigravidae in CSEA group was 3.42(0.38) cm and in the EA group it was 4.22(0.52) cm. The mean rate of cervical dilatation per hour in the control group among primigravidae in was 1.63(1.04) cm.

Multi:

The mean rate of cervical dilatation per hour in the multiigravidae in CSEA group was5.97 (0.58) cm and in the EA group it was 6.03(0.62) cm. The mean rate of cervical dilatation per hour in the control group among the multi it was 2.00(1.01) cm.

Category	Rate of Cervical Dilatation (in cms)				
	CSEA		EA		'p'
	Mean	S.D.	Mean	S.D.	
Primi	3.42	0.38	4.22	0.52	0.2248 Not significant
Multi	5.97	0.58	6.03	0.62	0.8776 Not significant

Category	Rate of Cervical Dilatation (in cms)				
	CSEA		CONTROL		'p'
	Mean	S.D.	Mean	S.D.	
Primi	3.42	0.38	1.63	1.04	0.021 Significant
Multi	5.97	0.58	2.00	1.01	0.014 Significant

Category	Rate of Cervical Dilatation (in cms)				
	EA		CONTROL		'p'
	Mean	S.D.	Mean	S.D.	
Primi	4.22	0.52	1.63	1.04	0.0061 Significant
Multi	6.03	0.62	2.00	1.01	0.0093 Significant

The mean rate of cervical dilatation was comparable between CSEA and EA groups.

The difference in the mean rate of cervical dilatation between the control group and CSEA group was statistically significant and the difference in the mean rate of cervical dilatation between the control group and EA group was also statistically significant.

AMOUNT OF DRUGS USED:

Bupivacaine

Primi

The amount of bupivacaine (in milligrams) used in CSEA group was on an average 31.83(15.76) and in the EA group it was on an average 32.92(6.11).

Multi

The amount of bupivacaine (in milligrams) used in CSEA group on an average was 17.86(6.54) and in the EA group it was 22.5(6.85). The difference was not significant among both primi and multi.

AMOUNT OF DRUGS USED:

Drug	CSEA		EA		'p'
	Mean	S.D.	Mean	S.D.	
Bupivacaine (mg)					
Primi	31.83	15.76	32.92	6.11	0.3845(Not significant)
Multi	17.86	6.54	22.5	6.85	0.2636(Not significant)
Fentanyl (µcg)					
Primi	74.3	25.25	52.67	9.77	**0.0017 (Significant)**
Multi	50.23	8.85	36.00	10.95	**0.0001(Significant)**

Fentanyl

Primi

The amount of fentanyl (in micrograms) used in CSEA group was on an average 74.3(25.25) and in the EA group it was 52.67(9.77).

Multi

The amount of fentanyl (in micrograms) used in CSEA group was on an average 50.23(8.85) and in the EA group it was 36.0(10.95). The difference was significant among both primi and multi.

TOTAL NO OF TOP UPS GIVEN:

Category	Number of top ups				
	CSEA		EA		'p'
	Mean	S.D.	Mean	S.D.	
Primi	2.5	1.24	2.83	0.58	0.0413(Significant)
Multi	1.38	0.51	1.85	0.55	**0.0407 (Significant)**

Primi

The average number of top ups required in primi was 2.5(1.24) in CSEA group and 2.83(0.58) in EA group.

Multi

The average number of top ups required in multi was 1.38(0.51) in CSEA group and 1.85(0.55) in EA group. The difference was significant among both primi and multi.

ONSET OF PAIN RELIEF:

Category	Onset of pain relief (in minutes)				
	CSEA		EA		'p'
	Mean	S.D.	Mean	S.D.	
Primi	1.71	0.33	5.25	1.36	**0.0001(Significant)**
Multi	1.38	0.36	4.46	1.05	**0.0001(Significant)**
Total	1.54	0.38	4.84	1.25	**0.0001(Significant)**

Onset of analgesia in the CSEA group was within 1 to 2 minutes in both the primi and multi gravidae with a mean of 1.71(0.33) minutes in primi and 1.38(0.36) minutes in multi.

EA

Onset of analgesia in the EA group was within 3 to 7 minutes in both the primi and multi gravidae with a mean of 5.25(1.36) minutes in primi and 4.46(1.05) minutes in multi.

Time to get the painless uterine contraction was noted and was taken as the onset time. There was a significant difference in the onset times between the two study groups with the CSEA group having rapidity of analgesic onset as early as 1 minute post block.

QUALITY OF PAIN RELIEF:

Primi

The mean VAS score in primi of CSEA group was 1.4 (0.73) and in the EA group was 2.54(0.97).

Multi

The mean VAS score in multigravidae of CSEA group was 0.51(0.24) and in the EA group was 1.27(0.6). On analysis of the VAS scores between the two groups there is a statistically significant difference both among primi and multi gravidae. Of greater significance is the immediate post block scores which average 0.31(0.18) in primi and 0.15(0.15) in multi of the CSEA group.

Visual Analogue Scale	CSEA		EA		'p'
	Mean	S.D.	Mean	S.D.	
Initial 45 minutes					
Primi	0.31	0.18	-	-	-
Multi	0.15	0.15	-	-	-
Total	0.23	0.18	-	-	-
After first 45 minutes					
Primi	2.47	1.4	-	-	-
Multi	0.83	0.32	-	-	-
Total	1.61	1.28	-	-	-
Total average					
Primi	1.4	0.73	2.54	0.97	**0.0022 Significant**
Multi	0.51	0.24	1.27	0.6	**0.0005 Significant**
Total	0.94	0.69	1.88	1.01	**0.0003 Significant**

GRADING:

CSEA

Pain relief was excellent in 84%, good in 12 % and satisfactory in 4% of parturients who received CSEA.

EA

Pain relief was excellent in 52%, good in 32% and satisfactory in 16% of parturients who received EA.

BREAKTHROUGH PAIN:

Breakthrough pain occurred in 4% of parturients who received CSEA and in 16% of parturients who received EA. The difference was significant statistically ($p<0.5$).

SENSORY LEVEL:

The sensory level obtained was adequate and between T6 to T10 in both the groups.

BREAKTHROUGH PAIN:

Break through pain	CSEA		EA	
	No.	%	No.	%
Present	1	4	4	16
Absent	24	96	21	84
Total	25	100	25	100

p = 0.032, significant

SENSORY LEVEL:

Sensory Level	CSEA		EA	
	No.	%	No.	%
T6	5	20	3	12
T7	-	-	-	-
T8	15	60	18	72
T9	-	-	-	-
T10	5	20	4	16
Total	25	100	25	100

DURATION OF LABOUR:

Stage	Duration of labour (in minutes)				
	CSEA		EA		
	Mean	S.D.	Mean	S.D.	'p'
Stage I					
Primi	122.92	45.8	99.6	15.20	0.1482 (Not significant)
Multi	70.38	23.98	69.63	25.84	0.7973(Not significant)
Stage II					
Primi	51.5	24.97	46.67	11.02	0.8618 (Not significant)
Multi	21.46	5.29	23.46	8.06	0.7799(Not significant)
Stage III					
Primi	6.82	1.66	6.7	1.4	0.361(Not significant)
Multi	4.62	0.96	3.85	1.28	0.0503(Not Significant)
Total duration					
Primi	180.67	67.53	152.33	26.38	0.3122(Not significant)
Multi	96.46	28.99	95.92	33.32	0.9653(Not significant)

DURATION OF LABOUR:

Stage	Duration of labour (in minutes)				
	EA		CONTROL		
	Mean	S.D.	Mean	S.D.	'p'
Stage I					
Primi	99.6	15.20	201.47	57.78	0.0027 (Significant)
Multi	69.63	25.84	145	38.83	0.0013 (Significant)
Stage II					
Primi	46.67	11.02	37.85	20.9	0.0793 (Not significant)
Multi	23.46	8.06	20.76	12.8	0.1021 (Not significant)
Stage III					
Primi	6.7	1.4	7.6	3.3	0.0925 (Not significant)
Multi	3.85	1.28	5.76	2.4	0.0839 (Not Significant)
Total duration					
Primi	152.3	26.38	246.92	24.25	0.0031 (Significant)
Multi	95.92	33.32	171.53	15.44	0.0019 (Significant)

Stage	Duration of labour (in minutes)				
	EA		CONTROL		
	Mean	S.D.	Mean	S.D.	'p'
Stage I					
Primi	99.6	15.20	201.47	57.78	0.0027 (Significant)
Multi	69.63	25.84	145	38.83	0.0013 (Significant)
Stage II					
Primi	46.67	11.02	37.85	20.9	0.0793 (Not significant)
Multi	23.46	8.06	20.76	12.8	0.1021 (Not significant)
Stage III					
Primi	6.7	1.4	7.6	3.3	0.0925 (Not significant)
Multi	3.85	1.28	5.76	2.4	0.0839 (Not Significant)
Total duration					
Primi	152.3	26.38	246.92	24.25	0.0031 (Significant)
Multi	95.92	33.32	171.53	15.44	0.0019 (Significant)

DURATION OF FIRST STAGE (ACTIVE PHASE) OF LABOUR:

Primi: The average duration of the first stage of labour in the primi (CSEA) group was 122.92 (45.8) minutes. The average duration of the first stage of labour in the primi (EA) group was 99.6 (15.2) minutes. The difference was statistically insignificant. The average duration of the first stage of labour in the primi (CSEA) group was 122.92 (45.8) minutes. The average duration of the first stage of labour in the primi (Control) group was 201.47(57.78) minutes. The difference was statistically significant. The average duration of the first stage of labour in the primi (EA) group was 99.6 (15.2) minutes. The average duration of the first stage of labour in the primi (Control) group was 201.47(57.78) minutes. The difference was statistically significant.

Multi: The average duration of the first stage of labour in the multi (CSEA) group was 70.38 (23.98) minutes. The average duration of the first stage of labour in the multi (EA) group was 69.63 (25.84) minutes. The difference was statistically insignificant. The average duration of the first stage of labour in the multi (CSEA) group was 70.38 (23.98) minutes. The average duration of the first stage of labour in the multi (Control) group was 145 (38.83) minutes. The difference was statistically significant. The average duration of the first stage of labour in the multi (EA) group was 69.63 (25.84) minutes. The average duration of the first stage of labour in the multi (Control) group was 145 (38.83) minutes. The difference was statistically significant.

DURATION OF SECOND STAGE OF LABOUR:

Primi: The average duration of the second stage of labour in CSEA group was 51.5(24.97) minutes. The average duration of the second stage of labour in EA group was 46.67 (11.02) minutes. The difference was statistically insignificant. The average duration of the second stage of labour in CSEA group was 51.5 (24.97) minutes. The average duration of the second stage of labour in Control group was 37.85 (20.9) minutes. The difference was statistically insignificant. The average duration of the second stage of labour in EA group was 46.67(11.02) minutes. The average duration of the second stage of labour in control group was 37.85 (20.9) minutes. The difference was statistically insignificant.

Multi

The average duration of the second stage of labour in the CSEA group was 21.46(5.29) minutes. The average duration of the second stage of labour in the EA group was 23.46(8.06) minutes. The difference was statistically insignificant. The average duration of the second stage of labour in the CSEA group was 21.46 (5.29) minutes. The average duration of the second stage of labour in the Control group was 20.76 (12.8) minutes. The difference was statistically insignificant. The average duration of the second stage of labour in the EA group was 23.46(8.06) minutes. The average duration of the second stage of labour in the Control group was 20.76(12.8) minutes. The difference was statistically insignificant.

DURATION OF THIRD STAGE OF LABOUR:

The average duration of the third stage of labour was comparable among primi and multi of CSEA, EA and control groups. There was no statistically significant difference.

TOTAL DURATION OF LABOUR:

Primi :

The mean total duration of labour in the CSEA group was

180.67(67.53) minutes. The mean total duration of labour in the EA group was 152.33 (26.38) minutes. The difference was statistically insignificant. The mean total duration of labour in the control group was 246.92 (24.25) minutes. The difference was statistically significant between the study and control groups.

Multi

The mean total duration of labour in the CSEA group was 96.46 (28.99) minutes. The mean total duration of labour in the EA group was 95.92 (33.32) minutes. The difference was statistically insignificant. The mean total duration of labour in the control group was 171.53(15.44) minutes. The difference was statistically significant between the study and control group. The mean total duration of labour in the multi (EA) group was 95.92(33.32) minutes. The mean total duration of labour in the multi (Control) group was 171.53(15.44) minutes. The difference was statistically insignificant. The difference was statistically significant.

MODE OF DELIVERY:

Mode of delivery	CSEA		EA		CONTROL	
	No.	%	No.	%	No.	%
Primi						
Labour Natural	6	50.0	6	50.0	10	83.3
LMC	2	16.7	2	16.7	-	-
Outlet	3	25.0	4	33.3	1	8.3
Instrumental Total	5	41.7	6	50.0	1	8.3
Caesarean	1	8.3	-	-	-	-
Total	12	100	12	100	12	100
Multi						
Labour Natural	13	100	12	92.3	12	92.3
LMC	-	-	-	-	-	-
Outlet	-	-	1	7.7	1	7.69
Instrumental Total	-	-	1	7.7	1	7.69
Caesarean	-	-	-	-	-	-
Total	13	100	13	100	13	100

Primi: 50% of the primi in the CSEA group had natural labour and 50% of the primi in EA group also had labour naturale. The results were comparable between the two study groups. 41.7% had instrumental delivery in CSEA group and 50% had instrumental delivery in the EA group. One primi gravida in the CSEA had caesarean delivery and none in EA group. The results were comparable and not statistically significant. 84% in the control group had labour naturale which was statistically significant when compared with those in CSEA and EA groups. Only 16.7% had instrumental delivery in the control group which again was statistically significant when compared to those in CSEA and EA groups. None had caesarean delivery in the control group which was comparable to those in the CSEA and EA groups.

Multi: 100 % of the multi in the CSEA group had natural labour and 92.3% of the multi in EA group also had labour naturale. The results were comparable between the two study groups. None had instrumental delivery in CSEA group and 7.7% had instrumental delivery in the EA group. None had caesarean delivery in either CSEA or EA group. The results were comparable and not statistically significant. 92% in the control group had labour naturale which was statistically not significant when compared with those in CSEA and EA groups. Only 8% had instrumental delivery in the control group which again was statistically not significant when compared to those in CSEA and EA groups. None had caesarean delivery in the control group which was comparable to those in the CSEA and EA groups.

INDICATIONS FOR ASSISSTED DELIVERY:

Indication	CSEA	EA	CONTROL
	No.	No.	No.
Failure of secondary forces	3	5	1
Fetal distress	1	2	1
Prolongation of II Stage	1	-	-
ROP – Non progression and fetal distress	1	-	-
Total no requiring assistance	6	7	2
Nil assistance required	19	18	23

Assisted deliveries include both forceps and lower segment caesarean section deliveries. Among the primigravidae assisted delivery was required by 50% in the CSEA group and 50% in the EA group. Among the multigravidae assisted delivery was required by none in the CSEA group and by 7.7% in the EA group. In the control group 8.3% of primigravidae required assisted delivery and 7.69% of multigravidae required assisted delivery.

APGAR SCORE:

Apgar Score	CSEA		EA	
	No.	%	No.	%
1 minute				
Mean	6.8		6.56	
S.D.	0.7		0.65	
'p'	0.0888 (Not significant)			
5th minute				
Mean	8.56		8.36	
S.D.	0.58		0.57	
'p'	0.1869 (Not significant)			

Apgar Score	CSEA		CONTROL	
	No.	%	No.	%
1 minute				
Mean	6.8		6.75	
S.D.	0.7		0.6	
'p'	(Not significant)			
5th minute				
Mean	8.56		8.4	
S.D.	0.58		0.61	
'p'	(Not significant)			

Apgar Score	EA		CONTROL	
	No.	%	No.	%
1 minute				
Mean	6.56		6.75	
S.D.	0.65		0.6	
'p'	(Not significant)			
5th minute				
Mean	8.36		8.4	
S.D.	0.57		0.61	
'p'	(Not significant)			

Foetal wellbeing was assessed using the APGAR scoring done at 1 minute and 5 minutes from the time since birth. The mean APGAR in the study (CSEA, EA) and control group among both primi and multi were similar.

COMPLICATIONS:

Pruritis was the most common complication occurring during CSEA (96%) followed by sedation (84%). In the EA group 32% had pruritis and 20% had sedation. The differences were statistically significant. Nausea and vomiting occurred in 16% of CSEA group and in 12% of EA group. The difference was statistically insignificant. Shivering occurred in 24% of CSEA group, 20% of EA group and 4% of control group. The difference was statistically insignificant. Headache occurred in 8% of CSEA group and in 4% of EA group. The difference was statistically insignificant. Backache occurred in 4% of CSEA and in 8% of control group. Urinary retention occurred in 4% each of CSEA and EA groups. Motor blockade occurred only in one parturient (4%) in the EA group which was of grade-1(modified bromage scale). Hypotension occurred in 12% of CSEA and in 4% of EA group. Incidence of respiratory depression associated with neuraxial opioids is dose dependent and typically ranges from 0.1 to 0.9% .There was no

instance of respiratory depression in either of the study groups.

Complications	CSEA		EA		CONTROL	
	No.	%	No.	%	No.	%
Pruritis						
Present	24	96	8	32		
Absent	1	4	17	68		
'p'	0.0001 (Significant)					
Shivering						
Present	6	24	5	20	1	4
Absent	19	76	20	80	24	96
'p'	0.2087 (Not significant)					
Sedation						
Present (25- Score 2 1 - score 1)	21	84	5	20		
Absent	4	16	20	80		
'p'	0.0001 (significant)					
Nausea						
Present	4	16	3	12		
Absent	21	84	22	88		
'p'	0.1173 (Not significant)					
Vomiting						
Present	3	12	3	12		
Absent	22	88	22	88		
'p'	0.0063 (Significant)					
Headache						
Present	2	8	1	4		
Absent	23	92	24	96		
'p'						
Backache						
Present	1	4	2	8	2	8
Absent	24	96	23	92	23	92
'p'						
Urinary retention						
Present	1	4	1	4	2	8
Absent	24	96	24	96	23	92
'p'						
Hypotension						
Present	3	12	4	16	2	8
Absent	22	88	21	84	23	92
'p'						
Motor blockade						
Present (Modf.bromage I)	-	-	1	4	-	-
Absent	-	-	24	96	-	-
'p'						
Respiratory depression						
Present	-	-	-	-	-	-
Absent	-	-	-	-	-	-
'p'						

DISCUSSION

Pain perception by the parturient is a dynamic process that involves both the peripheral and central mechanisms and as reported on the McGill pain questionnaire, is one of the most intense pain that a woman can experience. Regional techniques used in obstetrics provide optimal analgesia with minimal depressant effects on the mother and fetus while allowing the parturient to be awake and be able to participate in labour and delivery. In CSEA intrathecal opioids and local anaesthetics are injected and an epidural catheter is left in place. The principle advantages of low dose CSEA in labour are speed of onset, selective neural blockade, fine tuning of block with minimal sympathetic, motor, sensory, proprioceptive block which allows walking, voiding, bearing down, flexibility – block can be easily converted to anaesthesia for operative or assisted delivery, drug dose requirement is reduced, predictable, reliable- less incidence of failures or patchy block compared to epidural alone and improved maternal satisfaction.

PAIN IN LABOUR : PATHWAYS & MECHANISMS

Site of origin	Characteristic Stimulus	Neural involvement	Localization
Uterus	Contraction -? Ischemic? Plus acute stretch	Sympathetic out flow, root values T11/T12 spreading to T10 & L1	Referred to anterior rami of somatic roots; upper abdominal wall anteriorly down to groin; inner aspects upper thighs.
Peri-uterine tissues mainly posterior	Pressure-either with contraction or persistent. Usually associated with foetal malposition or unusual conformation of sacrum	Somatic roots of lumbo – sacral plexus	Distribution of posterior low and mid back; also back of thighs
Lower birth canal	Distention of vagina and perineum in second stage	Somatic roots S2/3/4	Accurate to site of stimulus- not referred
Bladder	Over- distension; can be persistent or felt during contraction	Sympathetic T11-? L2 via hypogastric plexus, parasympathetic	Usually supra pubic only; rarely referred to distribution of somatic sacral roots.
Myometrium and uterine visceral peritoneum	Abruption; scar dehiscence	T10 – L1	Accurate to surface marking of site of pathology.

Bupivacaine is the most widely used long acting amide local anaesthetic drug used in obstetric analgesia. It is effective in 0.125% or greater (0.0625%) dilution when combined with opioids. It produces high quality analgesia with minimal motor block. It has low potential for cumulative toxicity and produces differential blockade. Addition of fentanyl to bupivacaine allows the use of reduced concentrations of bupivacaine without compromising analgesia and achieves a reduction in the motor block. It is this reduction in the motor block which is a major driving force behind the use of neuraxial opioids. All parturients in both the study groups and in the control group went in for spontaneous labour and were included in the study from the active phase of labour. Labour was augmented either with artificial rupture of membranes or oxytocin infusion as per the needs of the parturient.

CONCLUSION

Combined spinal epidural analgesia with fentanyl – bupivacaine combination is associated with greater parturient satisfaction due to its rapidity of onset providing complete pain relief in 1.54minutes on an average. The quality of pain relief was excellent in 84% of parturients with very less requirement for supplemental analgesics. In the above respect CSEA was far superior compared to EA. CSEA has a favourable outcome on the progress of labour. It augments cervical dilatation and shortens the first stage of labour by producing good co-ordinated uterine contractions at regular intervals. The duration of the second stage of labour was prolonged without any maternal or foetal complications. Neonatal outcome was favourable as evidenced by the 1minute and 5 minute APGAR scores. The above effects were comparable to conventional group. Though the incidence of pruritis, sedation, nausea and vomiting were higher they were either transient or mild requiring no intervention. No major maternal or foetal complications occurred reflecting the safety profile of a properly conducted CSEA.Combined spinal epidural analgesia with fentanyl – bupivacaine combination is thus a safe and better alternative to EA as a technique of neuraxial block for effective labour analgesia.

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