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A Comparative study in the post operative lumber spine surgeries: Epidural ropivacaine with dexmedetomidine and Epidural ropivacaine with clonidine for post operative analgesia

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Abstract

Aim: To compare efficacy of epidural ropivacaine with dexmedetomidine and epidural ropivacaine with clonidine for post operative analgesia in post operative lumber spine surgeries.

Materials And Methods: This study included 60 cases of ASA grade 1& 2 patients aged 18-65 years of either sex who were scheduled to undergo elective lumber spine surgeries. After completion of surgery epidural catheter insertion done by surgeon in epidural space before closure of wound 2.5 cm above the incision and 7 cm downward deviated & fixed in separate dressing. This was done to prevent infection in epidural space. Patients were divided in two groups. RD and RC group in post operative period when patient complain of pain VAS score evaluated and drug given. Onset of drug effect, peak effect time, duration of analgesia, haemodynamic, respiratory rate, side effects noted.

Results: We observed in RD group onset of analgesia7.48±0.85 min which is reduced in comparison to RC group which was 8.72±1.28 min. All haemodynamic stability more with dexmedetomidine group. Duration of analgesia was prolonged when we added dexmedetomidine in ropivacaine 410.5±37.44 min. Addition of dexmedetomidine produced profound sedation.

Conclusion: From our study we concluded that epidural route provided adequate analgesia in spine surgeries in terms of VAS score & haemodynamic parameters. Dexmedetomidine is a better neuraxial adjuvant to ropivacaine when compared to clonidine for providing early onset & prolonged post operative analgesia & stable cardiorespiratory parameter.

Keywords: RD, RC PACU

Introduction

Epidural Analgesia is a safe and effective way to manage pain in many kinds of patients. Epidural analgesia is the administration of opioids and/or local anaesthetics into the epidural space.

Sources of pain after spinal surgery included the skin incision, healing muscle tissue with reactive spasm, Dural and nerve root inflammation, the site of bone excision at vertebrae, the graft donor site & internal fixation devices reacting with overlying tissue.

Various methods have been tried for the management of post operative pain in spine surgeries out of which epidural techniques are becoming most promising.

α-2 adrenergic receptor agonist has been the focus of interest for their sedative, analgesic, perioperative sympatholytic and cardiovascular stabilizing effects with reduced anaesthetic requirements also prolongation of effects of local anaesthetic drug. So, we used Dexmedetomidine & Clonidine with Ropivacaine in epidural analgesia in spinal surgeries for efficacy of analgesia, compare efficacy & safety.

Materials And Methodology

This prospective, randomized study was carried out in the Department of Anaesthesia, The Gujarat Cancer and Research Institute (GCRI), Ahmedabad during 2020-2023.

Our study included 60 cases of ASA Grade I & II patients aged 18-65 years of either sex who were scheduled to undergo an elective lumbar spine surgery. After obtaining institutional board approval, written informed consent was obtained from each patient.

We excluded patients with cardiac diseases, haematological diseases, bleeding &coagulation test abnormalities, H/o drug abuse& allergy to local anaesthetics, upper thoracic, cervical spine surgery, permanent neurological disorder from our study.

Patients were kept NBM for 10 hours before surgery and instructed to take all the drugs which he/she was taking as a part of treatment as scheduled with sips of water on the day of the surgery.

On the arrival of the operation theatre, all the vital monitors like ECG, NIBP, SpO2 were attached to the patient. HR, BP, SpO2 were recorded.

Patients were premedicated with IV Inj.Glycopyrrolate 0.004 mg/kg, Inj. Ondansetron 0.08 mg/kg and Inj. Ranitidine 1 mg/kg. Patients were induced with i.v. Inj. Thiopentone Sodium 5mg/kg, Inj.Vecuronium Bromide 0.1 mg /kg and Inj.fentanyl citrate 2 µg/kg. i.v. Lignocaine 2% 1.5mg/kg was given to prevent the stress response to intubation. Patients were ventilated manually using a mask with 100% O2 for 3 mins. and intubated with the proper sized 42 flexomettalic ETT. Proper placement of endotracheal tube was confirmed by bilateral air entry in lungs and etCO2.

As it's a lumbar spine surgery so that patients were put in prone position. Again, after placing the patient in prone position bilateral air entry was checked in both lungs. Inj. Methylprednisolone 1gm i.v. in 100cc NS over 20 min. given to reduce inflammation. Inj. Tranexamic acid 1gm i.v. bolus given to reduce blood loss. Anaesthesia was maintained with nitrous oxide and oxygen, inhalational agent like Sevoflurane or isoflurane and Infusion of vecuronium bromide 0.001mg/kg/hr.

All patients were mechanically ventilated on volume control mode of a ventilator (tidal volume:6-8 ml/kg and respiratory rate: 12-16/min to maintain etCO2 25-30 mmHg). All patients were catheterized and urine output was maintained at 0.5 ml/kg/hr. Epidural catheter inserted by surgeons in space before closure of wounds

2.5cm above the incision 7cm downward deviated & fixed in separate dressing. This was done to prevent infection in epidural space.

Anaesthesia was stopped when surgery was completed. Neuromuscular blockade was antagonized with 0.008 mg/kg of Glycopyrrolate and 0.05 mg/kg of Neostigmine after putting patient in supine position & sufficient respiratory activity was observed and consciousness was regained, patients were extubated. Extubation time, recovery time was recorded. Patients were taken to the postoperative unit and hemodynamic parameters and side effects were watched for. We had removed epidural catheter after 24 hrs on completion of our study.

In post operative period when patient complained for pain, VAS score was evaluated. Patients were divided in 2 groups with 30 patients in each group.

GROUP RD: - ROPIVACAINE (0.2%) + DEXMEDETOMIDINE (1mcg/kg) 20ml total

GROUP RC: - ROPIVACAINE (0.2%) + CLONIDINE (2mcg/kg) 20ml total

Drugs were given when VAS > 4.

HR, BP, respiratory rate, VAS score was recorded at 30min,1,2,3,4,5,6,7,8,12,24 hrs. Onset of analgesia, time of peak effect, duration of analgesia, side effects, respiratory rate, hemodynamic parameters were recorded. Patients were also given rescue analgesia whenever needed and quantity and time were noted.

VAS Score

The visual analogue score (VAS) is a validated, subjective measure for acute and chronic pain. Scores are recorded by making a handwritten mark on a 10-cm line that represents a continuum between **"no pain"** and **"worst pain possible".**

Statistical Analysis

The data were recorded as predesigned and pretested proforma and was tabulated and master chart was prepared. Demographic data, heart rate, systolic BP, diastolic BP, MAP, VAS score, Respiratory rate, S/E were tabulated as mean ± SD. Statistical significance were tested by student T test. Microsoft word & excel were used to generate table & graph. P-value less than 0.05 considered as significant. All data analysis was done using statistical package for the social sciences (SPSS) version 21.

Observation & Results

Table 1: Demographic Characteristics of Patients In Both The Groups

Demographic Characteristics	Group RD	Group RC	P Value
AGE (YEARS)	40.7 ± 15.02	46.1 ± 13.7	0.151
WEIGHT (KG)	57.46 ± 8.19	60.1 ± 6.65	0.113
MALE / FEMALE	18/12	17/13	0.793
ASA PS (I/II)	19/11	17/13	0.598

The mean age of patient was 40.7 ± 15.02 in group RD and 46.1 ± 13.7 in group RC.

Majority of the patients were male in both group RD (60%) and group RC (56.7%).

The mean weight of patient was 57.46 ± 8.19 in group RD and 60.1 ± 6.65 in group RC.

Majority of the patients were ASA physical status I in both group RD (63.3%) and group RC (56.7%).

Both the study group are comparable with respect to Age, Gender, weight and ASA physical status. The difference is statistically not significant (p>0.05).

Table 2: Comparison of analgesic characteristics in both the groups

Analgesic characteristics	Group RD	Group RC	P value
Onset of analgesia (min)	7.48 ± 0.85	8.72 ± 1.28	0.0001
Peak effect of analgesia (min)	11.43 ± 1.77	13.55 ± 1.84	0.0001
Duration of analgesia (min)	410.5 ± 31.44	356.0 ± 30.52	0.0001

The time to onset of Analgesia was shorter in group RD (7.48 ± 0.85) compared to group RC (8.72 ± 1.28). The difference is statistically significant (p<0.05).

The Peak Effect of Analgesia was shorter in group RD (11.43 ± 1.77) compared to group RC (13.55 ± 1.84). The difference is statistically significant (p<0.05).

The mean Duration of Analgesia was longer in group RD (410.5 ± 31.44) compared to group RC (356.0 ± 30.52). The difference is statistically highly significant (p<0.05).

Table 3: Comparison of heart rate in both the groups

Heart Rate	Group RD		Group RC		P value
	Mean	SD	Mean	SD	
Baseline	82.70	5.85	81.97	8.60	.701
15 min	81.07	6.09	77.83	6.77	.057
30 min	80.33	7.88	77.00	8.38	.118
1 hour	78.80	7.74	75.10	7.59	.067
2 hours	78.17	4.86	74.60	6.64	.021
3 hours	80.07	4.86	76.33	7.04	.020
4 hours	80.90	3.64	77.17	5.02	.002
5 hours	81.17	2.53	77.50	3.97	.000
6 hours	81.70	4.19	77.83	3.98	.001
7 hours	82.07	4.65	78.40	3.69	.001
8 hours	82.53	6.62	78.87	4.16	.013
12 hours	82.30	5.50	78.63	5.92	.016
24 hours	82.87	3.66	79.20	5.50	.004

The above table shows the changes in heart rate in post operative period. Looking from the data in the table we can see that mean heart rate does not reduced much in both groups till 15 min. after that it significantly reduced in group RC compared to group RD till the end of study, with maximum decrease at 2 hours. sound to be statistically significant (P value <0.05).

Table 4: Comparison of systolic BP in both the groups

Systolic BP	**Group RD**		**Group RC**		**P value**
	Mean	SD	Mean	SD	
Baseline	122.53	3.89	123.27	7.10	.622
15 min	121.07	3.00	126.40	5.64	.000
30 min	120.80	2.14	124.00	3.40	.000
1 hour	118.23	1.28	121.47	3.40	.000
2 hours	117.33	3.21	120.73	2.38	.000
3 hours	120.30	7.49	123.60	3.73	.035
4 hours	121.50	9.22	124.93	3.43	.061
5 hours	121.93	6.39	125.20	4.35	.024
6 hours	122.33	4.04	125.60	2.85	.001
7 hours	123.13	5.14	126.80	3.13	.001
8 hours	123.80	4.77	127.27	4.25	.004
12 hours	123.60	4.88	126.93	3.39	.003
24 hours	124.13	4.58	128.10	4.38	.001

This table shows the changes in systolic BP in post operative period. Looking from the data in the table we can see that mean systolic BP does not reduced much in both groups till 30 min. after that it significantly reduced in group RD compared to group RC till the end of study, with maximum decrease at 2 hours. sound to be statistically significant (P value <0.05)

Table 5: Comparison of diastolic bp in both the groups

DIASTOLIC BP	**GROUP RD**		**GROUP RC**		**P VALUE**
	Mean	SD	Mean	SD	
Baseline	80.00	7.04	80.53	5.96	.753
15 min	79.40	7.91	82.07	5.57	.137
30 min	78.60	6.52	81.00	5.11	.118
1 hour	77.33	5.05	80.40	3.91	.011
2 hours	76.63	3.47	79.57	2.62	.000
3 hours	78.60	2.84	81.73	5.14	.005
4 hours	79.33	2.80	82.30	4.57	.004
5 hours	79.67	2.23	82.83	5.75	.007
6 hours	79.93	3.04	83.03	5.44	.008
7 hours	80.30	3.99	83.73	2.72	.000
8 hours	80.87	4.09	84.40	4.94	.004
12 hours	80.87	3.00	84.23	5.72	.006
24 hours	81.40	3.41	84.67	4.56	.003

The above table shows the changes in diastolic BP in post operative period. Looking from the data in the table we can see that mean diastolic BP does not reduced

much in both groups till30 min. after that it significantly reduced in group RD compared to group RC till the end of study, with maximum decrease at 2 hours. sound to be statistically significant (P value <0.05)

Table 6: Comparison of Map In Both The Groups

MAP	GROUP RD		GROUP RC		P VALUE
	Mean	SD	Mean	SD	
Baseline	94.18	5.27	94.78	4.99	.652
15 min	93.29	5.50	96.84	4.59	.009
30 min	92.67	4.37	96.36	3.75	.001
1 hour	90.97	3.41	92.76	3.24	.042
2 hours	90.20	2.86	91.96	1.94	.007
3 hours	92.50	3.01	94.36	3.92	.044
4 hours	93.39	3.29	95.18	3.21	.037
5 hours	93.76	2.51	95.62	4.02	.035
6 hours	94.07	2.28	95.89	3.75	.027
7 hours	94.58	3.06	98.09	2.14	.000
8 hours	95.18	3.14	98.69	3.67	.000
12 hours	95.11	2.55	98.47	4.04	.000
24 hours	95.64	2.68	99.13	3.30	.000

The above table shows the changes in MAP in post operative period. Looking from the data in the table we can see that mean MAP does not reduced much in both groups till 30 min. after that it significantly reduced in group RD compared to group RC till the end of study, with maximum decrease at 2 hours. sound to be statistically significant (P value <0.05).

Table 7: Comparison of respiratory rate in both the groups

RESPIRATORY RATE	GROUP RD		GROUP RC		P VALUE
	Mean	SD	Mean	SD	
Baseline	12.54	1.30	13.14	1.54	.112
15 min	12.70	1.49	12.96	1.38	.489
30 min	12.78	1.53	12.66	1.05	.727
1 hour	12.91	1.57	12.86	1.45	.900
2 hours	12.83	1.37	12.65	1.39	.623
3 hours	13.27	1.59	13.07	1.13	.577
4 hours	13.38	1.85	12.74	1.11	.109
5 hours	13.26	1.54	12.84	0.99	.222
6 hours	12.72	1.20	12.78	1.07	.824
7 hours	13.18	1.55	13.75	1.35	.133
8 hours	12.67	1.23	13.48	1.42	.022
12 hours	13.72	1.65	13.97	1.58	.558
24 hours	13.60	0.81	13.40	0.93	.380

The above table shows the changes in respiratory rate in postoperative period. Looking from the data in the table we can see that the mean respiratory rate does not change much in both the groups and is found to be statistically insignificant throughout the whole study (P value>0.05).

Table 8: Comparison of vas in both the groups

VAS	GROUP RD		GROUP RC		P VALUE
	Mean	SD	Mean	SD	
Baseline	4.1	0.8	4.2	0.9	1.000
15 min	0.7	0.5	1.0	0.7	0.024
30 min	0.9	0.8	1.3	0.6	0.055
1 hour	1.0	0.7	1.5	0.7	0.011
2 hours	1.1	0.8	1.5	0.6	0.023
3 hours	1.2	0.9	1.7	0.6	0.021
4 hours	1.1	0.9	1.8	0.7	0.001
5 hours	1.1	0.9	1.6	0.7	0.030
6 hours	1.3	0.7	4.1	0.9	0.0001
7 hours	3.8	1.0	4.7	0.7	0.0001
8 hours	4.2	1.0	5.1	0.7	0.0001
12 hours	4.9	0.9	5.5	0.5	0.001
24 hours	5.3	0.7	5.9	0.3	0.0001

The above table shows mean VAS score during the study. VAS score starts to decreases from 15 min. in both groups with more in group RD effects last till 6 hrs with peak effect at 2 hours. Looking from the data in the table we can say that there is a significant reduction in mean VAS score in both groups with more decrease in group RD as compared to group RC. The difference is statistically significant (P value <0.05).

Table 9: Distribution according to side effect in both the groups

SIDE EFFECT	GROUP RD	GROUP RC	P VALUE
Nausea	2 (6.7%)	1 (3.3%)	0.907
Dizziness	1 (3.3%)	1 (3.3%)	
Headache	1 (3.3%)	2 (6.7%)	
Shivering	1 (3.3%)	2 (6.7%)	
Total	5 (16.7%)	6 (20%)	

The table shows distribution of side effects in both the groups. Side-effects were very less in both the groups which was statistically insignificant (P value>0.05). Both the drugs have a very good clinical profile.

Discussion

After spine surgeries pain relief is required for subjective comfort in addition inhibiting nociceptive impulses caused by trauma & to blunt autonomic as well as somatic reflexes to pain[7]. Lumbar spine surgeries with dorsal approach are notorious for severity of post operative pain, increased morbidity and incidence of complications and prolonged postoperative

rehabilitation. In addition, unrelieved pain itself is a risk factor for development of chronic pain syndrome[6].

Sources of pain after spine surgeries included the skin incision, healing muscle tissue with reactive spasm, Dural and nerve root inflammation, the site of bony excision of vertebra & graft donor site, internal fixation devices reacting with underlying tissue. The surgical incision for spine surgeries involved nerve supply area of note more than six spinal segments. So, it requires large amount of drug than usual, so taking into account drug of (2ml/segment) will be sufficient to give adequate analgesia[3].

Epidural analgesia has been shown to be superior to i.v. analgesia with respect to quality of pain control, incidence of adverse effects & pulmonary, cardiac & gastro intestinal dysfunction[4]. Many LA agents like lidocaine, bupivacaine, and ropivacaine have been used for epidural analgesia. Drugs like opioids, clonidine, dexmedetomidine, midazolam and ketamine are used as adjuvant to LA to increase the duration of analgesia, decrease the individual dose of the drug & thereby decreasing the unwanted adverse effects of LA[3].

Epidural dexmedetomidine is an α-2 agonist, which has numerous beneficial effects[1]. It acts on both presynaptic and postsynaptic nerve terminals and central nervous system. Thereby decreasing the sympathetic outflow and norepinephrine release causing sedative, anti-anxiety, analgesic, sympatholytic, and hemodynamic effects[1,2].

Clonidine has been used successfully over the few years as adjuvants to anaesthetic for above said purpose and the introduction of dexmedetomidine has further broadened the scope of α-2 agonists in post-operative epidural analgesia. Swifter onset of action of local anaesthetics, extended duration of post-operative analgesia and stable hemodynamic parameters make these drugs useful adjuvants in post-operative analgesia.

In human studies using epidural α-2 agonists like clonidine & dexmedetomidine have been previously proved that they decrease neuraxial opioid included S/E such as respiratory 62 depression, nausea, urinary retention & pruritus. Epidural administration of α-2 agonists is linked with sedation, analgesia, anxiolysis, hypnosis & sympatholysis. Also, swifter onset of action of LA, extended duration of post operative analgesia and stable hemodynamic parameters make these drugs useful adjuvants in post operative analgesia.

In our study 60 patients were taken and randomly divided into 2 groups with 30 patients in each group. Patients of GROUP 1 will receive total 20ml of ROPIVACAINE (0.2%) with DEXMEDETOMIDINE (1mcg/kg) & GROUP 2 will receive total 20 ml of ROPIVACAINE (0.2%) with CLONIDINE (2mcg/kg) with its effectiveness as an adjuvant in post-operative epidural analgesia was studied in patients who underwent lumber spine surgeries. The demographic profile of our patients in both groups were comparable with respect to age, height, weight, ASA grade distribution. We used VAS score in our study to evaluate the efficacy of epidural route. Our study begins in post operative period, there was the effect of drug used for GA, so perception of mild pain to differs among patients.

In our study VAS score was used to evaluated the efficacy of epidural route for analgesia. We started our study in post operative period when patients VAS>4. At that time according to study group we give drug epidurally. Drug effect started at 7.48 ± 0.85 min in RD group & 8.72 ± 1.28 min in RC group. Drop in VAS

score in RD group at 11.43 ± 1.77 min & in RC group at 13.55 ± 1.84 min.

Increasing trend of mean VAS score after 5 and 7 hours of post injection of the drug after that fall in mean VAS score after epidural top up in both groups. Mean VAS score increases in RC earlier than RD. we had done our study till 24 hrs. none of the patients required additional analgesia during this period. Epidurally both the groups provided good analgesia but dexmedetomidine improved the efficacy.

The results of our study have showed that addition of either dexmedetomidine or clonidine as an adjuvant to epidural ropivacaine not only increases the duration of analgesia but also provide a good sedation level in the post-operative period. Dexmedetomidine has a significantly longer duration of analgesic effect when compared to clonidine as it enables an earlier onset and establishment of analgesia. These findings were similar to that of studies done by **Antonio et al[6]** who studied the analgesic & sedative effect by clonidine or dexmedetomidine when given along with epidural ropivacaine during post operative period of period of patient undergoing subcostal cholecystectomy. 40 patients of both sexes were included in this randomised double-blind study. They were divided into 2 groups. Group CG received clonidine 1mcg/kg along with 20ml of 0.75% epidural ropivacaine. Group DG received dexmedetomidine 2mcg/kg along with 20 ml of 0.75% epidural ropivacaine. Analgesia and sedation were evaluated 2-, 6- and 24-hours anaesthetic recovery. Both groups present some grade of sedation in the moments 2 and 6 hours, with statistically significant difference between the two moments for the dexmedetomidine group. There has been analgesia in both groups, especially at 2 and 6 hours. There has been statistically significant difference among periods of 2, 6 and 24 hours in the dexmedetomidine group; in the clonidine group, this statistically significant difference was observed between the periods of 2 and 6 hours and between 2 and 24 hours.

M.S. Sarvanan babu[10] done same study in patients in post operative spine surgeries in double blinded fashion based on computer generated data. Two groups Group RC & RD. they concluded that epidural route provided adequate analgesia in terms of VAS score & overall patient satisfaction.

S. Kiran, Kavita Jinjil[3] studied evaluation of dexmedetomidine and fentanyl as additives to ropivacaine for epidural anaesthesia & analgesia found prolonged post operative analgesia, lesser need for top ups and lesser total dose of post operative LA with dexmedetomidine to ropivacaine as compared to fentanyl.

Babu et al[1] compared the effects of epidural with dexmedetomidine and ropivacaine with clonidine for post operative analgesia in spine surgeries. They included a wide variety of patients ranging from PIVD, spine tumours, spine fracture, scoliosis correction, etc. 60 subjects were randomly allocated into 2 groups receiving either 20 ml 0.2% ropivacaine and 1 ug/kg dexmedetomidine (RD group) and 20 ml 0.2% ropivacaine and 2 ug/kg clonidine (RC group) via epidural catheter. Onset of analgesia, time to peak effect, duration of analgesia, cardiorespiratory parameters, side-effects and need of rescue i.v. analgesics were observed. Group RD had earlier onset and earlier peak analgesic effect, more prolonged duration of analgesia and greater stability of cardiorespiratory parameters when compared with group RC. None of the patients needed rescue analgesics in either group. The S/E profile was also

comparable. They concluded that epidural route provided acceptable analgesia in spine surgeries and avoided the need of i.v. analgesics. Dexmedetomidine is a better neuraxial adjuvant compared with clonidine for providing early onset and prolonged post-operative analgesia & stable cardiorespiratory parameters. Dexmedetomidine and Clonidine are good adjuvant to local anaesthetic agents when administered for epidural block. Addition of both has been found to prolong the duration of analgesia without increasing adverse effects. When 64 administered epidurally, both drugs produce analgesia by interacting with α-2 adrenergic receptors. These receptors are located on the superficial laminae of spinal cord and brain stem nuclei associated with pain, so analgesia can be produced at peripheral, spinal and brain stem sites.

Bajwa SJ et al[2] in 2011, compared the efficacy and clinical profile of two a-2 adrenergic agonists, dexmedetomidine and clonidine, in epidural anaesthesia in patients undergoing vaginal hysterectomy. The patients were divided into 2 groups: Group RD received 17 ml of 0.75%epidural ropivacaine and 1.5µg/Kg dexmedetomidine, while group RC received mixture of 17 ml of 0.75% ropivacaine of ug/kg of clonidine. The initial and post-operative block characteristics and cardio-respiratory parameters were comparable and statistically non-significant, however the sedation scores with dexmedetomidine were significantly better than clonidine. authors concluded that dexmedetomidine is a better neuraxial adjuvant compared to clonidine for providing early onset of sensory analgesia, adequate sedation and prolonged post-operative analgesia in patients undergoing vaginal hysterectomy.

In human studies using epidural α-2 agonists like clonidine and dexmedetomidine have been conducted previously which proved that it doesn't cause any neurological deficit. Hence to decrease neuraxial opioid induced side effects such as respiratory depression, nausea, urinary retention and pruritus. α-2 agonists are being broadly assessed as substitute for post- operative pain relief. Epidural administration of α-2 agonists is linked with sedation, analgesia, anxiolysis, hypnosis and sympatholytic.

The vital signs remained stable throughout the study period in both groups which confirms the established effects of α-2 agonists providing a hemodynamically stable in post-operative period. Although a slight difference in heart rate and blood pressure, mean arterial pressure was observed between both groups, the difference was statistically significant suggesting dexmedetomidine had a better hemodynamic stability and maintenance. VAS score was also observed to be better in dexmedetomidine group compared to clonidine group. The group was statistically significant (p value<0.05). duration of analgesia- 410.5 ± 31.44min in RD group & 356.0 ± 30.52min in RC group. Peak effect- 11.43 ± 1.77min in RD group & 13.55 ± 1.84 min in RC group. S/E- like nausea, headache, shivering, dizziness was observed in 16.7% in RD group & in 20% in RC group.

Both hypotension and bradycardia were seen more in patients with clonidine as adjuvant. These findings were similar with the study done by **Sukhminder et al**, in which he compared the effectiveness dexmedetomidine and clonidine in epidural anaesthesia but in paediatric population with upper abdominal surgeries when bupivacaine was used.

Zaric et al[11] compared the effects of 0.1%, 0.2%,0.3% ropivacaine with 0.25%% bupivacaine. Motor block was minimal with 0.1% ropivacaine, so that all subjects

could be mobilized; it was moderate with 0.2 and 0.3% ropivacaine and most intense with 0.25% bupivacaine. Hence ropivacaine was chosen for this study. Epidural ropivacaine has been used in previous studies in higher concentrations of 0.75% Lower concentration (0.2%) of the drug was chosen to avoid motor blockade and haemodynamic instability. After spinal surgery, any motor blockade due to epidural analgesia should be strictly avoided because postoperative hematoma with the development of paralysis due to compression of the spinal cord or cauda equina syndrome may not be detected.

Gottschalk et al[8] used 0.1% ropivacaine via epidural route and got significantly lower VAS scores but continuous infusions were used in that case. This low concentration of ropivacaine was chosen to avoid any kind of motor blockade in the lower extremities.

Blumenthal et al[9] used 0.3% ropivacaine via epidural route in scoliosis correction surgery and found excellent analgesic parameters as well as reduced motor blockade, but they used a double epidural catheter technique. The patients belonging to the dexmedetomidine group showed better analgesic profile in terms of onset of analgesia, time taken to reach peak effect, and total duration of analgesia and these findings were statistically significant. This probably can be explained by the greater affinity of dexmedetomidine to alpha 2 adrenergic receptors than clonidine (8 times).

Placing a catheter in the epidural space of a patient undergoing spine surgery is not devoid of risks. There are chances of infection leading to formation of an epidural haematoma, epidural abscess and surgical site infection. Rigorous vigilance and frequent monitoring of the patient is mandatory to detect early evidences of development of such complications, especially if post operative anti thrombotic therapy is initiated to prevent deep vein thrombosis. to prevent such complications epidural insertion site is kept away from the main incision 2.5cm above the incision 7cm downward deviated and placed by neurosurgeon themselves. This can help prevent infection. Further research needs to be carried out on a much larger group of patients to determine the actual incidence of catheter related post operative infective complications. More studies need to be done to assess the efficacy of epidural analgesia on all levels of spinal 66 surgeries. Optimum dose of the adjuvant added to the epidural local anaesthetics needs to be determined by carrying out similar studies using different doses of the adjuvant drugs.

Hence to summarise this

➢ Onset of analgesia which was 7.48 ± 0.85 min. with dexmedetomidine which was reduced as compared to addition of clonidine to ropivacaine which was 8.72 ± 1.28min.

➢ Fall in HR, SBP, DBP & MAP was more with clonidine group than with dexmedetomidine group. The group receiving dexmedetomidine had less fluctuations in hemodynamic as compared to clonidine group. The difference was statistically significant.

➢ No episode of respiratory depression was noted in both the study groups which are more common when opioids were used.

➢ With addition of dexmedetomidine to ropivacaine duration of analgesia is 410.5 ± 31.44min. and with addition of clonidine to ropivacaine the duration of analgesia is 356.0 ± 30.52 min. do it can be said that dexmedetomidine prolongs the duration of analgesia when added with ropivacaine & give epidurally. The difference is statistically significant.

➢ The addition of dexmedetomidine & clonidine significantly prolonged the time for further analgesic requirement. None of the patients who received dexmedetomidine & clonidine require an additional rescue analgesia during study period.

➢ The addition of dexmedetomidine epidurally produced profound sedation that compared to clonidine.

Conclusion

It can be concluded from the study that epidural route provided adequate analgesia in spine surgeries in terms of VAS score and hemodynamic parameters, overall patient satisfaction and need of less intravenous analgesics in both groups. dexmedetomidine is a better neuraxial adjuvant to ropivacaine when compared to clonidine for providing early onset and prolonged post operative analgesia and stable cardiorespiratory parameters.

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