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Original Research Article

Comparison of Dexmedetomidine VS Clonidine as an Adjuvant to Ropivacaine for Epidural Anaesthesia in Lower Limb Surgeries

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Conflict of interest: Nil

Abstract

Introduction: Regional Anaesthesia is an excellent choice which provides effective intra & post- operative analgesia with a single technique which is being possible due to the availability of long-acting amide local anaesthetics like Ropivacaine and by the addition of adjuvants like clonidine and Dexmedetomidine.

Aims: We compared the effects of Clonidine (0.5mcg/ kg) with Dexmedetomidine (0.5mcg/kg) as an adjunct to Epidural 0. 75% Ropivacaine in lower limb surgeries in adult patients.

Materials and Methods: This randamized study was carried out in the department of Anaesthesiology. This study 60 patients undergoing elective lower abdominal surgeries and lower limb surgeries, aged between 18-45 years of either gender, belonging to ASA grade I and II randomly divided into two groups by lottery method. After taking written informed consent from patients, they were subjected to epidural catheterization with 16 or 18 G touhy`s needle and epidural anaesthesia given.

Results: The mean time of onset of sensory blockade in Dexmedetomidine group is significantly less than Clonidine group. The 2 segment regression time in Dexmedetomidine group was significantly higher than Clonidine group. The mean duration of sensory blockade and onset of motor blockade was significantly higher with Dexmedetomidine group than Clonidine group. The mean time and duration of onset of motor blockade was significantly less in Dexmedetomidine group than Clonidine group than control group. The duration of analgesia was significantly prolonged and highest in the Dexmedetomidine group compared to Clonidine group. Both groups were similar in haemodynamic stability and side effects ($P > 0.05$, statistically not significant).

Conclusion: Dexmedetomidine is a better adjuvant than clonidine in epidural anaesthesia as far as patient comfort, stable cardio-respiratory parameters, intra-operative and post-operative analgesia is concerned.

Keywords: Dexmedetomidine, Clonidine, Intra-operative and post-operative analgesia, sensory blockade, motor blockade.

Introduction

International Association for the Study of Pain ―IASP‖ defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage". Pain during surgery is often underestimated and under treated. Being purely subjective, pain and its intensity vary widely among patients. The threshold of pain is variable largely because of its emotional component. The relief of pain during surgery is "the reason for existence" of anaesthesiology. It is right to say that the anaesthesiologist's experience, acquired in the field, should be extended into the postoperative period, as this has many beneficial effects for the patient.

While the intra-operative pain experienced by the patient has been underestimated, that of post-operative pain relief has been neglected to a large extent. In this context, many anaesthesiologists have advocated various methods to counter pain both intra-operatively and extending into the post-operative period much to the satisfaction of the patients.

The cost of general anaesthesia, the skill and specialized equipment needed for its administration coupled with an indifferent supply of anaesthetic gases and drugs and lack of monitoring equipment especially in peripheral areas in a country like India made Regional Anaesthetic techniques as choice because they are relatively inexpensive and easy to administer.

Regional anesthesia is currently the most effective method of reducing the stress response especially in patients with surgical procedures involving the lower part of the body. In view of the wider application of regional anesthetic procedure in modern anesthesia practice, there is a need for local anesthetic with desirable properties like longer duration of sensory blockade and lesser duration of motor paralysis. Surgical methods and the anaesthetic techniques have evolved and improved drastically over the last two decades. Many techniques and drug regimens, with partial or greater success, have been tried from time to time to calm the patients and to eliminate the anxiety component during regional anaesthesia.[1,2]

The fear of surgery, the strange surroundings of the operation theatre, the sight and sound of sophisticated equipment, dynamicity of an 'operation' during regional anaesthesia and the masked faces of so many strange personal makes the patient panic to any extent. [3] The intense sensory and motor block, continuous supine position for a prolonged duration and the inability to move the body during regional anaesthesia brings a feeling of discomfort and phobia in many of the patients.[4]

Adjuvant agents are pharmacological drugs that, when co-administered with local anaesthetic agents, may improve the speed of onset, the quality and / or duration of analgesia with desirable sedation. A wide range of drugs has been assessed for both neuraxial and peripheral nerve blocks. Various adjuvants that can be added to local anaesthetics and administered in central neuraxial blockade. Sedation, stable haemodynamic and an ability to provide smooth and prolonged post-operative analgesia are the main desirable qualities of an adjuvant in neuraxial anaesthesia. α-2 adrenergic agonists have both analgesic and sedative properties when used as an adjuvant in regional anaesthesia.[5,6] Dexmedetomidine is a highly selective α2

adrenergic agonist with an affinity of eight times greater than clonidine. There is no such study which has compared the dose equivalence of these drugs but the observations of various studies have stated that the dose of clonidine is 1.5−2 times higher than dexmedetomidine when used in epidural route.[7,8] The anaesthetic and the analgesic requirement get reduced to a huge extent by the use of these two agents.

Materials and Methods

This randamized study was carried out in the department of Anaesthesiology, Gandhi Hospital, Secunderabad from June 2020 to July 2021 The study was approved by the Hospital ethical committee. In this study 60 patients undergoing elective lower abdominal surgeries and lower limb surgeries, aged between 18-45 years of either gender, belonging to ASA grade I and II randomly divided into two groups by lottery method. After taking written informed consent from patients, they were subjected to epidural catheterization with 16 or 18 G touhy`s needle and epidural anaesthesia given.

Sample Size: 30 subjects in group RD and 30 subjects in group RC.

Group RC: The control group comprises of patients in whom 15ml of 0.75% Ropivacaine with Inj. clonidine 0.5µg/kg administered epidurally.

Group RD: Consists of patients in whom 15ml of 0.75% Ropivacaine with inj. Dexmedetomidine – 0.5µg/kg administered epidurally.

Inclusion Criteria: Both genders of age between 18-45 years, ASA grade I and II physical status undergoing lower limb surgeries.

Exclusion Criteria: Those with known sensitivity to local anaesthetics, Patients with local infection at the site of injection and Uncooperative patient

Method:

Pre-Anaesthetic Evaluation:

During preoperative visit patient‘s detailed history, general physical examination and systemic examination were carried out. Basic demographic data like age, sex, height and weight were recorded. During pre-anaesthetic checkup the linear visual analogue scale (VAS) was explained to all patients using 10 scale. Informed consent was obtained from all the 60 patients after the detailed explanation of the procedure to be performed.

All the patients were pre-medicated with 0.02 mg/kg midazolam IM 1 hour prior to the procedure. The pulse rate, respiratory rate, blood pressure and SpO2 were recorded before starting the case. Peripheral venous cannulation was done with 18G IV cannula and all the patients were preloaded with 10ml/kg Ringer Lactate solution.

Patients were placed in left lateral position and under strict aseptic precautions, after local infiltration with 1% Lignocaine hydrochloride the epidural space was identified with a 18/16G Tuohy needle at L3-L4 interspace, by ―loss of resistance‖ technique. 18/16G epidural catheter was threaded through the needle in to the epidural space for 3-4cms and secured with adhesive tapes to the back. After negative aspiration for blood and CSF, 3ml of 2 % Lignocaine with 15µgm of adrenaline was given as test dose and the patient was turned to supine position. After 5 minutes if there is no adverse reaction for the test dose, intravascular and intrathecal placement were ruled out and the study

drugs were administered. Group RC, n=30, were given 15ml of 0.75% Ropivacaine and Inj. Clonidine 0.5µg/kg epidurally.

Group RD, n=30 were given 15ml of 0.75% Ropivacaine and inj. Dexmedetomidine 0..5µg/kg epidurally.

The level of sensory block was assessed by bilateral pinprick method, quality of motor blockade assessed by BROMAGE SCALE at 5, 10, 15, 20, 25, 30 minutes intervals.

Time of injection was recorded as 0 hour. In the two groups the following are noted:

1. The onset of sensory blockade at T10 level,
2. Maximum sensory level achieved,
3. Time to attain maximum sensory level,
4. Onset of motor blockade,
5. Two segment regression time,
6. Duration of sensory block,
7. Duration of motor block,
8. Duration of analgesia were recorded continuously SpO2, respiratory rate, heart rate, were monitored.
9. Hemodynamic variables like systolic BP, diastolic BP, Mean Arterial Pressure, heart rate were recorded every 5 minutes until 30 minutes and at 15 minutes interval thereafter upto 90 minutes and then at 30 minutes interval till the end of surgery.
10. Sedation scores were recorded just before the initiation of surgery and thereafter every 20 minutes during surgical procedure.
11. Side effects like nausea, vomiting, bradycardia, hypotension, respiratory depression, dry mouth and shivering were noted in both groups.

Onset of sensory blockade- is taken from the completion of injection of study drug till the patient does not feel the pin prick.

Onset of motor blockade- is taken from the completion of injection of study drug till the patient is unable to move feet. Duration of motor blockade- is taken from the completion of injection of study drug till motor block regresses to bromage scale 1.

Duration of sensory block- is taken from the completion of injection of study drug till sensory block regression to T12 dermatomal level.

Duration of analgesia – is taken from the completion of injection of study drug till the patient has VAS (Visual Analogue Scale) score ≥ 4.

BROMAGE SCALE:

Scale	Criteria	Degree of block
0	Free movement of legs, feet with ability to raise extended leg	None
1	Inability to raise extended leg and knee flexion is decreased but full extension of feet and ankles is present	Partial 33%
2	Inability to raise leg or flex knees; flexion of ankle and feet present	Partial 66%
3	Inability to raise leg, flex knee or ankle, or move toes	Complete paralysis

Grading of sedation was evaluated by a Wilson's sedation scale:

1. Fully awake & oriented;
2. Drowsy;
3. Eyes closed but rousable to commands;
4. Eyes closed but rousable to mild physical stimulus
5. Eyes closed but not rousable to mild physical stimulus

If there was fall in blood pressure more than 30% below the baseline value, even

after intravenous fluids administration, inj. Ephedrine was given in titrated doses. If the pulse rate was less than 30% of baseline, inj. Atropine 0.6mg IV was given. If respiratory rate was less than 10/min respiratory depression was diagnosed. At the end of the surgery the patients were shifted to post- operative ward, they were monitored for every 30 minutes for the first six hours and there after every hour for 24 hours period. Pain was managed with top up of 10ml of 0.2% Ropivacaine with 25mcg of fentanyl [l].

Statistical Data:

At the end of the study all the data is compiled and statistically analysed using:

- Diagramatic representation
- Descriptive data presented as mean ±SD.
- Continuous data analyzed by paired or unpaired ―t‖ test.
- Chi – square test to analyze statistical difference between the two groups.

Results

Of the Sixty patients, 30 belong to group RD (15ml of 0.75% Ropivacaine with Inj. Dexmedetomidine 0.5µg/kg) and 30 patients belong to group RC (15ml of 0.75% Ropivacaine with Inj. Clonidine 0.5µg/kg)

The age distribution in RD group and RC group was 21-45 years and mean age in RC group was 33.8 and mean age in RD group was 34.28.mean age distribution is comparable and there is no statistical significance (p=0.8771).

Table 1: Demographic Distribution among the Both Groups

Age distribution	**Group RC**	**Group RD**
21-24 years	6 (20%)	7 (23.3%)
25-29 years	3 (10%)	4 (13.3%)
30-34 years	5 (16.7%)	5 (16.7%)
35-39 years	7 (23.3%)	7 (23.3%)
40-44 years	7 (23.3%)	6 (20%)
45 years	2 (6.7%)	1 (3.3%)
Total	30	30
Genders		
Males	17	14
Females	13	16
Weight (Kgs.)		
Range	46-70	46-67
Mean	58.2+10.9	56.1+9.5
SD	6.62	6.45
Height (cms.)		
Height in cms (range)	145-164	145-168
Mean	155.4+10.1	158.37+8.2
SD	14.30	11.18

Among the sixty patients 29 were females and 31 were males, the distribution was similar in both the groups as shown by the table and bar chart here. P=0.77 which is not significant. The mean weight in both the groups were comparable, there is no statistical significance.

p=0.4 The mean height was also statistically comparable in both the groups, and statistically not significant. P=0.22.

Table 2: Showing Mean Time and duration of Sensory Level in Both Groups

Group	Group RC	Group RD	P-Value
Mean Time of Onset of Sensory Block	9.5 ± 1.69	7.92 ± 1.63	0.0000001
Mean duration of onset of sensory blockade	14.32 ± 2.39	12 ± 2.68	<0.05
Mean Time of Onset of motor Block	20.76 ± 2.89	18.68 ± 2.56	0.0097
Mean duration of onset of motor blockade	228.6 ± 26.44	252.4 ± 28.45	0.0356
Two Segment Regression Time in Both Groups	124 ± 10.61	142.8 ± 10.32	0.0001

The mean time of onset of sensory block to T10 level in group RC was 9.56±0.82 min, in group RD was 7.95 ± 0.81 minutes. The statistical analysis by unpaired t-test showed statistically significant difference (p=0.0000001) between the two groups.

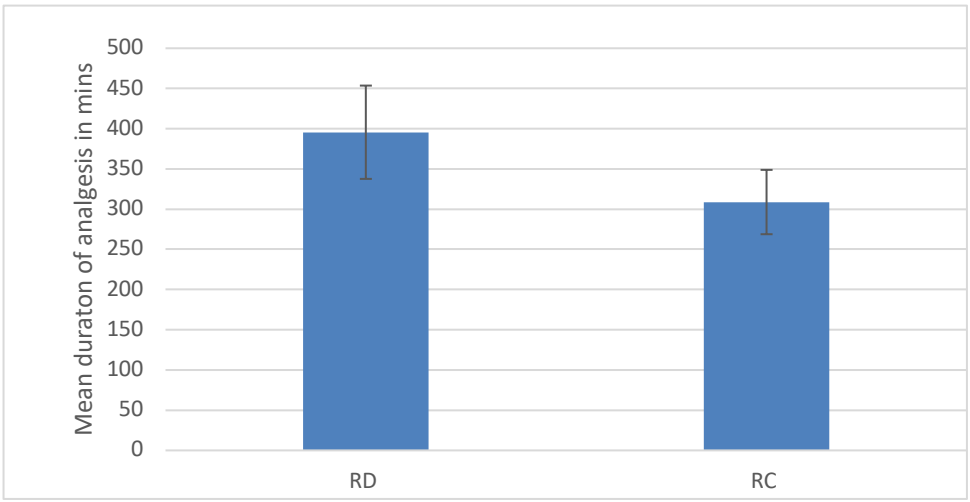
The mean time to achieve maximum sensory level 14.32 ± 2.39 for group RC, 12 ± 2.68 for group RD. P value calculated by unpaired t-test is 0.0022 which is statistically significant. (P<0.05).

The mean duration of onset of motor blockade in group RC was 20.76 minutes, in group RD was 18.68 minutes. The statistical analysis by unpaired t- test showed that there is statistically significant difference (p = 0.0097) in the two groups.

The mean duration of motor blockade in group RC was 228.6 ± 26.44 minutes, in group RD was 252.40 ± 28.45 minutes. The statistical analysis by unpaired t - test showed that there is a statistically significant difference (p <0.0356) in the two groups.

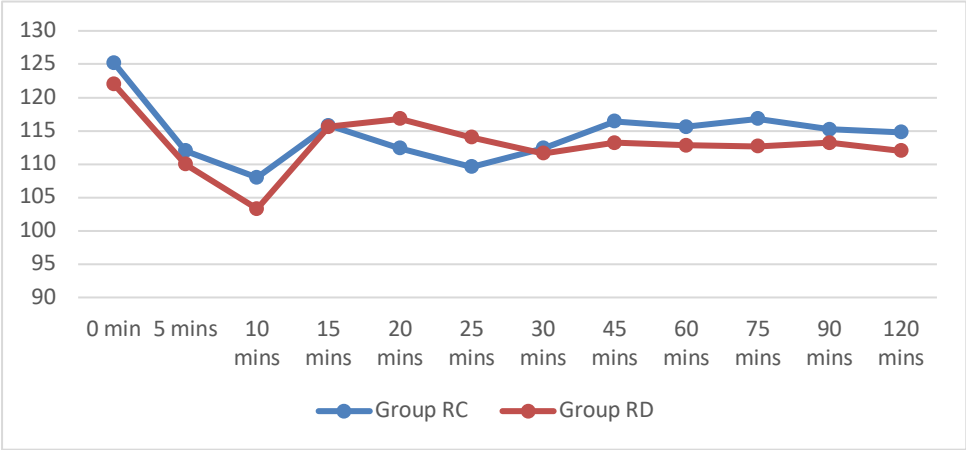
The two segment regression time in group RD was 142.8 ± 10.32 minutes, in group RC was 124 ± 10.61 minutes. The statistical analyses by unpaired t- Test showed that there was statistically significant difference (p <0.0001)between the two groups.

Graph – 1: Showing Mean Duration of Analgesia in Both Groups



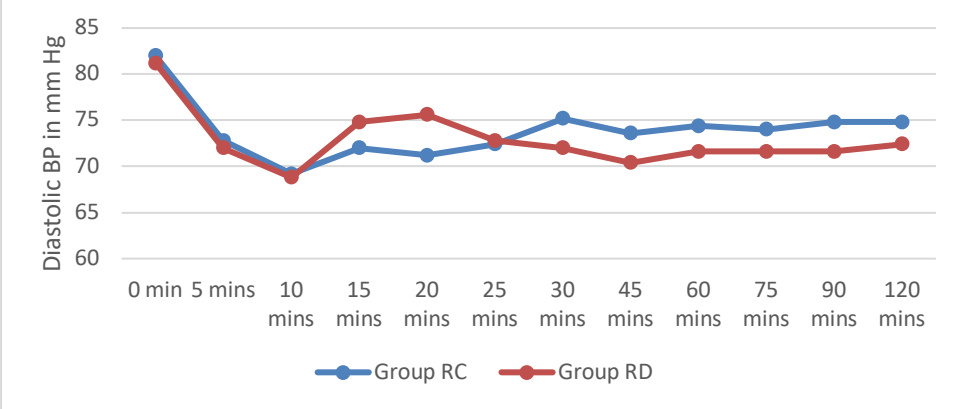
The mean duration of analgesia in group RC was 308.8 ± 40.01 minutes, in group RD was 395.6 ± 58.12 minutes. The statistical analysis by unpaired t-test showed that there is a very statistically

significant difference ($p < 0.0001$) between the two groups.



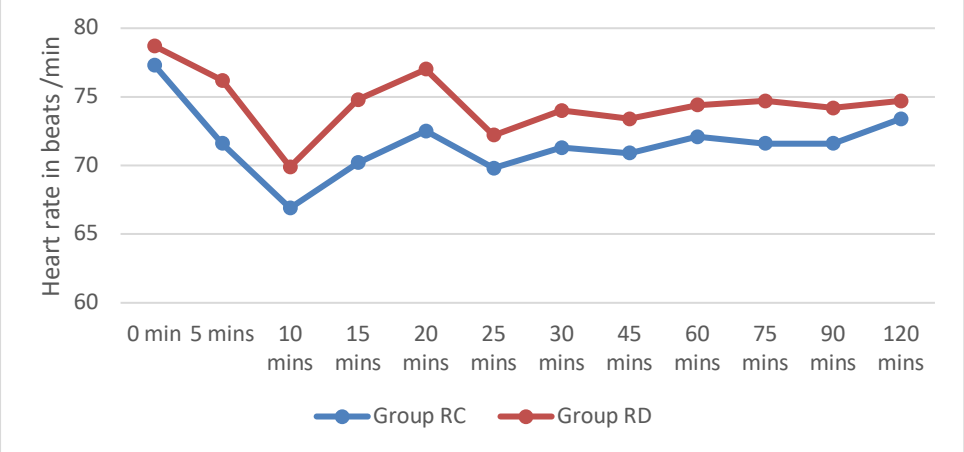
Graph 2: Showing Systolic Blood Pressure Variation among Both Groups

There is no significant difference in systolic BP in both groups in all time periods.



Graph 3: Showing Diastolic Blood Pressure Variation in Both Groups

There is no significant difference in diastolic BP in both groups in all time periods.



Graph 4: Showing Heart Rate Variation among Both Groups

There is no significant difference in heart rate in both groups in all time periods.

Table 3: Showing Sedation Score among Both Groups

Sedation Score	Group RC	Group RD	p-Value
1	13 (52%)	4 (16%)	<0.0001
2	4 (16%)	5 (20%)	0.5813
3	8 (32%)	16 (64%)	<0.0001
4	0	0	-
5	0	0	-

Mean sedation scores were significantly higher in RD group compared to RC group as 64% patients in group RD had a sedation score of 3 as compared 32% in group RC (P< 0.0001). Only 16% of the patients in the RD group had sedation scores of 1 compared to 52% wide and awake patients in RC group, which was a highly significant statistical entity (P< 0.0001). 16% patients in group RC, 20% patients in group RD had score 2 which is statistically not significant.

Discussion

Adequate treatment of post-operative pain is essential because inadequately treated pain increases post- operative morbidity and duration of hospital stay and also leads to chronic surgical pain. Hence we have undertaken a study to evaluate the efficacy of Dexmedetomidine with Ropivacaine by Epidural route compared to Clonidine with Ropivacaine by epidural route in patients undergoing Lower abdominal and lower limb surgeries.

The two groups were comparable with respect to age, weight, sex, height distribution. In our study the mean time of onset of sensory blockade at T10 in Group RD was significantly less than Group RC (Group RD 7.92 ± 1.63 min, Group RC 9.5 ± 1.69 min, P< 0.05). In a study conducted by Arun kumar et al [8], showed significantly earlier onset of sensory blockade in the patients receiving dexmedetomidine (8.53 ± 1.81 minutes) when compared to the patients receiving clonidine (11.93 ± 1.96minutes). Study conducted by Soni et al. [9] comparative study for better adjuvant with ropivacaine in epidural anaesthesia, the mean onset of sensory block was 5.7 + 2.0 min for dexmedetomidine and (9.6 ± 2.9) minutes for clonidine, which is significant. Another study conducted by Babu et al [10], comparison of dexmedetomidine And clonidine with ropivacaine in epidural, Addition of dexmedetomidine to Ropivacaine as an adjuvant resulted in an earlier onset (7.33 ± 1.76 minutes) of analgesia as compared to the addition of clonidine (8.40 ± 1.61 minutes).

In a study conducted by Sukhminder Jit Singh et al, Addition of dexmedetomidine to ropivacaine as an adjuvant resulted in an earlier onset (8.52 ± 2.36 minutes) of sensory analgesia at T10 as compared to the addition of clonidine (9.72 ± 3.44 minutes). (p <0.05) [11] In another study conducted by Sukhminder Jit Singh Bajwa et al Comparative evaluation of dexmedetomidine and fentanyl for epidural analgesia in lower limb orthopedic surgeries, Onset of sensory analgesia at T10 was earlier in dexmedetomidine group (7.12 ± 2.44 minutes) compared to fentanyl group (9.14 ± 2.94 minutes). [11] Our results are concurring with the above studies.

In our study the mean time to achieve maximum sensory level was significantly less in group RD compared to group RC (12 ± 2.68 minutes for group RD, 14.32 ±

2.39 minutes for group RC, P<0.05). Arun Kumar et al. [8] conducted study on dexmedetomidine and clonidine as an adjuvant to Ropivacaine for epidural anaesthesia in lower abdominal and lower limb surgeries- concluded that time to achieve maximum sensory level was faster in group RD compared to group RC. Sravana babu et al. [10] conducted study on dexmedetomidine and clonidine as adjuvant to Ropivacaine in epidural anaesthesia for post-operative analgesia in spine surgeries. The mean time to achieve maximum sensory level in group RC was 13.20 ± 2.90, in group RD was 11.66 ± 2.05 which is statistically significant (p<0.05). Shaikh and Sarala et al. [13] conducted study on epidural dexmedetomidine and clonidine with bupivacaine in patients undergoing lower limb orthopaedic surgeries. The mean time to achieve maximum sensory level in group RC was 17.13 ± 1.55, in group RD was 12.87 ± 1.04 which is statistically significant (p<0.00001). Sukhminder Jit Singh Bajwa et al. [12] conducted study on Dexmedetomidine and clonidine in epidural anaesthesia – Concluded that time to achieve maximum sensory level was shorter in group RD (13.14 ± 14) patients compared to group RC (15.80 ± 4.86). In a study by Tanmoy Ghatak et al, comparison of Magnesium sulphate Vs Clonidine, time to achieve T6 level was (16.93 ± 3.43) minutes in clonidine group of patients. [14]

Out of 30patients in group RC 11patients achieved T10 level, 10 patients achieved T12 level and 9 patients T8 and in group RD 10 patients achieved T10, 10 patients achieved T1 2 and 10 patients achieved T8. The highest sensory level achieved in both groups were comparable and they are statistically not significant (p>0.05)

In our study the mean time to onset of motor blockade in group RD was significantly less compared to group RC (18.68 ± 2.56 minutes in group RD, 20.76 ± 2.89 minutes in group RC, p<0.05). In contrast to our study Arun kumar et al. [19] found that no statistically significant time to complete motor blockade between two group RD it was 23.00 ± 4.27 and in group RC it was 23.07 ± 4.63 minutes. In a study of Shaikh and Sarala et al, showed Motor block of Bromage 3 was achieved earlier in patients from the dexmedetomidine group (19.30 ± 1.62) than of the clonidine (19.30 ± 1.62) group [13].Sukhminder Jit Singh Bajwa et al. [12] Dexmedetomidine and clonidine in epidural anaesthesia –time to achieve complete motor block in group RD (17.24 ± 5.26) was earlier than patients in group RC (19.52 ± 4.06). Similar results were shown in the study by Sukhminder Jit Singh Bajwaet al establishment of complete motor blockade was 18.16 ± 4.52 minutes in dexmedetomidine group compared to fentanyl group (22.98 ± 4.78) Postoperative analgesia was prolonged significantly in the RD group (366.62 ± 24.42). [12] Our results are concurring with above studies. The difference between our study and Arun kumar et al may be attributed to the smaller doses of dexmedetomidine (1µg/kg) and clonidine (1µg/kg) used in his study.

In our study the two segment regression time in Group RD was significantly higher than Group RC in Group RD was 142.8 ± 10.32 minutes, in group RC was 124 ± 10.61 minutes) Arun Kumar et al. [9] conducted study on dexmedetomidine and clonidine as an adjuvant to Ropivacaine for epidural anaesthesia in lower abdominal and lower limb surgeries, found that two segment regression time was prolonged in group RD (161 minutes) compared to group

RC (138 ± 1.17 minutes). In a study conducted by Shaikh and sarala et al, In dexmedetomidine group, time for two segment regression (136 ± 6.86) was prolonged when compared to clonidine group (124.97 ± 6.65).13 In a study conducted by Sukhminder Jit Singh et al, Addition of dexmedetomidine to ropivacaine as an adjuvant, in group RD, There was prolonged time to two segmental dermatomal regression (136.46 ± 8.12 minutes). In 2014, Kaur et al. [15] conducted study on ropivacaine versus dexmedetomidine and ropivacaine in epidural anaesthesia in lower limb surgeries, concluded that the mean time taken for regression of sensory blockade to T10 dermatome in group RD was (404.18 ± 17.93) when compared to plain ropivacaine (277.58 ± 17.66) minutes. According to Alves TC et al [16], epidural Clonidine with Ropivacaine significantly prolonged sensory, motor and post- operative analgesia, when compared to plain Ropivacaine alone. Our results are concurring with above studies.

Our study also showed that duration of motor block was significantly prolonged in group RD compared to group RC [252.40 ± 28.45 minutes (4.2 hours) Vs 228.6 ± 26.44 minutes (3.8 hours), p<0.05]. In study done by Kaur et al., compared ropivacaine and ropivacaine with dexmedetomidine, the total duration of motor block was also prolonged in group B [385.92 ± 17.719] (ropivacaine with dexmedetomidine) as compared to group A [259 ± 15.486] (ropivacaine) and the difference was highly significant (p = 0.000). In our study duration of sensory block was significantly prolonged in group RD was [297.6 ± 33.7 minutes (4.95 hours)] compared to group RC [259.4 ± 20.98 minutes (4.31 hours)] (p<0.0001).

In our study duration of analgesia in group RD was 395.6±58.12 minutes, (6.58 hours) compared to group RC 308.8 ± 40.01 minutes (5.13 hours). It is statistically very significant as p<0.0001. Arun Kumar et al. [8] conducted study on dexmedetomidine and clonidine as an adjuvant to Ropivacaine for epidural anaesthesia in lower abdominal and lower limb surgeries – concluded that duration of analgesia was prolonged in group RD (316 ± 31.15) minutes when compared to group RC (281 ± 37) minutes. In a study conducted by Babu et al [10], the duration of analgesia prolonged in dexmedetomidine group (407.00 ± 47.06) compared to clonidine group (345.01 ± 35.02) [21] it is statistically significant p<0.0001. In a study conducted by Sukhminder Jit Singh et al, Addition of dexmedetomidine to ropivacaine as an adjuvant, Dexmedetomidine provided a smooth and prolonged post-operative analgesia as compared to clonidine. Time for rescue analgesia was comparatively longer in Dexmedetomidine group compared to clonidine (310.76 ± 23.75 minutes, P< 0.05) [12]. Similar results were shown by Sukhminder Jit Singh Bajwa et al dexmedetomidine and fentanyl for epidural analgesia in lower limb orthopedic surgeries concluded that Postoperative analgesia was prolonged significantly in the RD group (366.62 ± 24.42) [11]. In a study conducted by A.M. Abd-Elwahab et al, Addition of dexmedetomidine or clonidine to caudal bupivacaine significantly promoted analgesia. Both drugs were comparable as regards the analgesia duration [24]. Salgado PF et al showed that there is clear synergism between epidural

dexmedetomidine and ropivacaine, prolonged sensory and motor block duration time($p < 0.05$) and postoperative analgesia ($p < 0.05$), and also resulted in a more intense motor block. [17] F.W. Abdallah, R. Brull et al studied Facilitatory effects of perineural dexmedetomidine on neuraxial and peripheral nerve block. [18] Mukesh I Shukla et al evaluated epidural clonidine for post-operative pain relief. They have showed that Clonidine significantly leads to rapid onset of analgesia and prolongs the duration of postoperative analgesia and reduces postoperative analgesic consumption.[19]

In our study the following hemoodynamcis like systolic blood pressure, diastolic blood pressure, mean arterial pressure, heart rate were monitored in both the groups. These parameters were monitored at 0, 5, 10, 15, 20, 25, 30 minutes and every 15 minutes there after upto 120 minutes. Hemodynamic variables SBP, DBP, MAP and heart rate are comparable in both the groups. In our study 20% (n=5) of patients in group RC, 16% (n=4) in group RD had bradycardia. 24% (n=6) of patients in group RC, 32% (n=8) in group RD had hypotension. These values are statistically not significant. In Similar study conducted Arun kumar et al 8observed that HR significantly fell in both groups by 20% in 30- 50 minutes after the epidural injection and blood pressure decreased by 25% in 30- 50 minutes following epidural injection. However this change was not statistically significant. In contrast to our study, Babu et al [10]. conducted study on dexmedetomidine and clonidine as adjuvant to Ropivacaine in epidural anaesthesia for post-operative analgesia in spine surgeries – found that heart rate and mean arterial pressure started to decrease at 30 minutes post injection in both groups and this decrease was statistically significant in the RC group compared to RD group ($p<0.05$). In study conducted by shaikh and sarala et al.[13] conclude that cardio respiratory parameters stable throughout study period. There was decreasing trend of HR and MAP after post injection in both groups and decrease at 20 minutes was not statistically significant. None of patient showed significant bradycardia and hypotension at any time. In a study done by Bajwa et al,[11,12] found that cardiorespiratory parameters stable throughout procedure, although a slight decrease in heart rate and mean arterial pressure was observed in both groups, it never fell down to more than 15% of the baseline values, which was statistically not significant.

Grading of sedation was evaluated by a Wilson's sedation scale showed 13 (52%) and 4 (16%) graded as 1, 4 (16%) and 5 (20%) graded as 2, 8 (32%) and 16 (64%) graded as 3, in group RC and RD respectively. None of the patients graded as 4 or 5 in either group. Mean sedation scores were significantly higher in RD group compared to RC group as 64% patients in group RD had a sedation score of 3 as compared 32% in group RC ($P< 0.0001$). Only 16% of the patients in the RD group had sedation scores of 1 compared to 52% wide and awake patients in RC group, which was a highly significant statistical entity ($P< 0.0001$). In a similar study conducted by Arun kumar et al, [8] Ramsay sedation score was taken for assessment of sedation. They found that 90% patients receiving dexmedetomidine were sedated to score of 3-4 for 90 minutes after drug administration. The difference in the sedation between the two groups was found to be statistically significant (p value =

0.000). In a study done by Bajwa et al,[12] also showed a significantly higher level of sedation in the patients, who received dexmedetomidine in comparison to clonidine. In a similar study conducted by shaikh and sarala et al., [13] who compared bupivacaine with clonidine and dexmedetomidine epidurally, patients in both the groups are remained calm throughout surgery but mean sedation score were significantly higher in the dexmedetomidine group compared to clonidine group (P< 0.0001). Sedation scores were statistically significant at 20 minutes, 40minutes, and 60 minutes in group A (dexmedetomidine) compared to group B (clonidine).These findings from the studies mentioned above concur from our study, showing that dexmedetomidine causes significant higher sedation than clonidine when given epidurally. In our study 20% (n=5) of patients in group RC, 16% (n=4) in group RD had bradycardia. 24% (n=6) of patients in group RC, 32% (n=8) in group RD had hypotension. 16% (n=4) of patients in both the groups had nausea, 4% (n=1) in both the groups had vomiting. 24% (n=6) of patients in group RC, 20% (n=5) in group RD had dry mouth. The occurrence of these side effects are statistically not significant. In a study conducted by Arun kumar et al [8], found no statistically significant difference in the atropine and mephtermine requirement as rescue in both the groups. They had two patients in group RC and one patient in group RD who had dry mouth. In a similar studies done by Bajwa et al, shaikh and sarala et al., and Babu et al., the incidence of side effects were comparable in both groups. None of the patients in two groups had any other side effects like respiratory depression, shivering etc. [11-14]

Conclusion

We conclude that dexmedetomidine is a better adjuvant than clonidine in epidural anaesthesia as far as patient comfort, stable cardio-respiratory parameters, intra-operative and post-operative analgesia is concerned. Overall the experience with dexmedetomidine was quite satisfactory as compared to clonidine because of its superior sedative and anxiolytic properties during the surgical procedure under regional anaesthesia.

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