Original Research Article

Comparison of Bupivacaine 0.5% + Normal Saline , Bupivacaine 0.5%+ Fentanyl (50 µG) & Bupivacaine 0.5%+ Clonidine (150 µG) Intrathecally for Postoperative Analgesia in lower limb Orthopedic Surgeries

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Abstract

Objective : To compare the efficacy ,onset of sensory and motor block and the level of sensory and motor block achieved in the groups.of Bupivacaine+ normal saline,Bupivacaine heavy + fentanyl & Bupivacaine heavy + clonidine for subarachnoid block in lower limb orthopaedics surgeries.**Methods** this study was conducted in a randomized fashion on 90 ASA grade 1 &ll patients in the age group of 20-50 years posted for surgery .The subjects were randomly allocated to 3 groups of 30 each:Group l **:** 3 ml of 0.5% heavy bupivacaine + 1 ml normal saline intrathecally.Group ll : 3 ml of 0.5% heavy bupivacaine + 1 ml fentanyl (50µg) intrathecally.Group lll :3 ml of 0.5% heavy bupivacaine + 1 ml clonidine (150 µg)intrathecally.All patients were monitored intraoperatively for vital parameters. Onset and recovery of sensory and motor block noted. All vital parameters were noted at regular interval and patients were observed for any side effects intraoperatively and postoperatively.For postoperative pain measurement VAS score was taken and the time taken for regression of 2 sensory segments and time taken for regression of sensory block below L_1 level was noted.**Results**: There was no statistical difference was observed in the time of onset of sensory and motor block. In comparison to the other two group, the duration of sensory and motor block was significantly more in group lll where clonidine was added to hyperbaric bupivacaine intrathecally. There was significant prolongation of effective ananlgesia in group lll i.e. the requirement of rescue analgesic was delayed when compared to group ll& group l. There was significant fall in BP in group lll. There was a reduced incidence of nausea and vomiting in group lll but mild sedation and low incidence of bradycardia was found.The VAS score for postoperative pain score was significantly less in group lll in comparison to the other 2 groups. **Conclusion** To conclude, the combination of group lll drugs i.e. 0.5% hyperbaric bupivacaine +150µg clonidine intrathecally is found better as it provides better postoperative analgesia as compared to group l & group ll in the present study.

Keywords: 0.5% Heavy Bupivacaine , Fentanyl , Intrathecally. Clonidine

Introduction

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or describe in terms of such damage. Pain and its alleviation have been a challenge for humans for centuries. Surgical trauma is real and severe tissue damage and surgical pain is a universal phenomenon, which is aggravated by associated muscle and visaral stretching. By rendering the patient pain free during surgery, anaesthesiologists have succeeded to a considerable extent, but once the luxury of pain free surgery is over. The patients has to face misery of postoperative pain. Relief of operative as well as postoperative pain is important because it interferes with respiration, bowel movements and micturition, associated with cardiac intability. Neuraxial anesthesia can provide a safer perioperative experience, greater satisfaction, reduced opioid consumption, and reduction of pain, while minimizing side effects.[1-3]In recent time various drugs are being used via subarachnoid and epidural route to provide optimum conditions for surgery and postoperative pain relief. While continuous spinal anaesthesia will obligate the drawbacks of spinal anaesthesia, most anaesthesiologists avoid this method because of the technical problems.The major advancement in improving the success of regional anaesthesia has come from the use of adjuvant drug with spinal and epidural anaesthesia. The commonly used adjuvants are opioids, clonidine, adrenaline, neostigmine, ketamine, midazolam etc .[3-5]Fentanyl, a short acting lipophilic opioid, was given intrathecally along with local anaesthetics by Belzarena and Co-workers in 1992.When local anaesthetic, bupivacaine is combined with intrathecal fentanyl, complete surgical anaesthesia could be obtained and there is intra and postoperative pain relief, with fewer side effect. Local anaesthetics may cause hypotension and weakness of the legs while opioids may result in nausea, itching , and the depressed breathing ,inspite of all these advances, problems of postoperative analgesia awaits a radical new approach. Attempts to find a suitable and safer agent and technique have been going on steadily.[6-9]Clonidine an alpha-2 adrenergic agonist has been used for many years as an antihypertensive agent .Experimental evidence indicate that alpha-2 adrenoceptor agonist could causes analgesia through their spinal an supraspinal actions and thereby could prolong the duration of sensory and motor block produced by spinal anaesthesia. When local anaesthetic bupivacaine is combined with intrathecal clonidine, complete surgical anaesthesia could be obtained and there is intra and

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post operative pain relief with fewer side effects. Interactions between a2-adrenergic agonist and local anaesthetics have also been proposed, e.g., the potentiation of the effect of lidocaine by clonidine. Neuraxial clonidine is considered to be free from neurotoxic effects even after prolonged intrathecalinfusion .[10-14]

Hence, the present study is being undertaken to compare the efficacy of conventional dose of intrathecal 0.5% bupivacaine alone, bupivacaine + fentanyl (50 µg) for post-operative analgesia in lower limb orthopaedic surgeries.

Materials and Methods

The present study comprises of 90 cases which were ASA Grade 1 &ll between the age group of 20-50 years of either sex. They were posted for elective or emergency basis surgery. They were distributed on randomized fashion under the department of Anaesthesiology, Government Medical College, Ratlam.

Consent: Written consent was obtained from the relatives of patients after explaining them the nature and purpose of the study. They were assured that confidentiality would be strictly maintained. The option to withdraw from the study was always open.

Exclusion Criteria: The patients with local infection, septicemia and known cases of coagulopathy or other bleeding diathesis were not included in the study while the patient in the ASA grade lll&lV were relatively excluded for purpose of detailed study (Patients with severe hypovolemia, increased ICP, severe stenoticvalvular heart disease or ventricular outflow obstruction, uncooperative patient, pre-existing neurological deficits, demyelinating lesions and spinal deformity were excluded from the study.)

Group Division:

Group I - 3 ml 0.5% Bupivacaine heavy and 1 ml normal saline intrathecally.

Group II - 3 ml 0.5% Bupivacaine heavy + Fentanyl 1 ml (50 µg) intrathecally.

Group III -3 ml 0.5% Bupivacaine heavy + Clodine 1 ml (150 µg) intrathecally.

Technique Conducted

All patients were preloaded with 10ml/kg body weight of Ringer lactate. All patients were sedated with 0.02 mg/kg midazolam (approx 1 ml of midazolam). excluded in the 3rd group of clonidine. Baseline pulse rate, blood pressure, respiratory rate, SpO2 and cardiac rhythm were recorded. As per protocol, each group consists of 30 patients.Under all aseptic precautions, lumbar puncture was performed in L3-L4 interspace by 25G quince needle with patients in sitting/lateral position. The drug was injected intrathecally in randomized manner in the three groups. The patient was turned supine for fixation of the drug. The patients were examined for baseline parameters after every 10 minutes for 1st 20 minutes till the fixation of the drug, then after every 10 minutes till the end of the surgery. The patient then shifted in the postoperative ward and then VAS was explained and VAS score was obtained as per the explanation of pain by the patient and monitored till the first complaint of pain by the patient.Postoperative HR, BP, respiratory rate, SpO2 was obtained upto first requirement of analgesic onset of motor blockade and sensory block was noted in all the patients. Level of sensory block assessed by pinprick method.Assessment of motor blockaded was done using Bromage scale. Degree of sedation was closely monitored in patients of group-III and in patients of group-I & group-II Sedation scoring was based on scoring system. Any hypotension that is 20% fall from baseline blood pressure and other side-effects like bradycardia, respiratory depression, nausea, vomiting, pruritis and tightness in the chest were noted. Any fall in MAP (Mean arterial pressure) of more than 20% of preinduction value was treated with an i.v. bolus of vasopressor drug and by pushing the I.V. fluids. Any episode of bradycardia was treated with increments I.V. Atropine. Tramadol was given as rescue analgesia when VAS score was greater then 4 or whenever patients complaints of pain.The patient was asked to mark on the scale the degree of pain that he was having at that moment. Degree of analgesia was taken as distance between the mark and 100 and recorded as % of pain relief. Recording was done at 30 minutes interval, till the patient had no relief and demanded analgesic supplements. At every assessment a fresh scale was shown to the patients. When the pain was complained by patients they were given conventional analgesics.

Observation Chart

The present study was carried out in the Department of Anaesthesiology, Government Medical College,Hospital, Ratlam. (M.P.)This study was carried out in 90 patients of ASA grade-1 &ll who underwent effective and emergency basis lower limb orthopaedic surgery.

Table 1:Distribution Of 90 Patients According To Drugs Injected

Group	No. of Patients	Drugs Administration
l	30	3ml (15 ml) of 0.5%bupiucacaine +1 ml normal saline
ll	30	3ml (15 ml) of 0.5%bupiucacaine +1 ml fentanyl (50 µg)
lll	30	3ml (15 ml) of 0.5%bupiucacaine +1 ml clonidine (150 µg)

The total volume of drug injected was similar(4 ml) in all the groups. In group – 1 the total volume was made to 4 ml by adding preservative free normal saline.

Table 2: Characteristics Of Sensory Block

S.No	Sensory Blocks	Group-l	Group-ll	Group-lll	'P'Value
1	Onset Action (mins)	7.37±1.43	7.03±1.45	7.07±1.41	P>0.05
2	Level	T_{10}	T_8	T_8	

It is evident from the above table that the fentanyl and clonidineboth does not significantly alter the time of onset of sensory block.

Table 3: Characteristics Of Sensory Block

S. No.	Sensory Blocks	Group-1	Group-lll	Group-lll	'P'Value
1	Time taken to regression of sensory block below t_{10} [in mins]	148.33±14.36	272.9±15.6	362.2±13.7	P<0.05
2	Time taken to regression of sensory block below L_1 [in mins]	175.7±9.42	301.6±10.4	411.9±33.5	P<0.05

[Calculation of time taken to regression of sensory block below T_{10}& L_1 level in all the groups of present study]

From the above table, it can be seen that the time taken to regression of sensory block below T10 level was significantly more in the group-lll than the other 2 groups (P<0.05) Similarly, the time taken to regression of sensory block belowL1 level was also significantly more in the group-lll than the other 2 groups (P<0.05). From this is can be concluded that clonidine significantly prolongs the duration of sensory block as compared to the fentanyl.

Table 4:Characteristics Of Motor Block

S. No.	Motor Blocks	Group-l	Group-ll	Group-lll	'P' Value
1	Onset of Action (mins)	5.9±1.18	5.87±1.25	5.8±1.21	P>0.05
2	Duration (mins)	166.5±11.61	177±23.69	305.11±14.14	P>0.05

From the table it can be seen that fentanyl does not alter the onset time and duration of motor block, whereas in group-11 clonidine also does not not alter the onset time but significantly prolongs the duration of motor block as compared to fentanyl in grop-ll.All patients had a grade 3 motor blockade in all the groups.(**GRADED BY BROMAGE SCALE**)

Table 5:Duration Of Total Analgesia And Effective Analgesia

S.No.	Duration of Analgesia	Group-l	Group-ll	Group-lll	'P' Value
1	Total Analgesia(from Subarachnoid injection to first report of pain in minutes.)	144±14.59	277.83±15.40	367.8±13.56	P<0.05
2	Effective Analgesia (from Subarachnoid injection to Rescue Analgesia in minutes.)	172.43±9.85	306.5±10.43	417.5±21.36	P<0.05

It is evident from the above table that both total analgesia and effective analgesia were significantly (P<0.05) prolonged in group-lll as compared to group-ll.

Table 6:Intraoperative Blood Pressure Changes At Different Time Interval

Time (min)	Group-l Blood Pressure Systolic	Group-ll Blood Pressure Systolic	Group-lll Blood Pressure Systolic
0 (Baseline)	126.93±5.91	126.37±8.52	123.6±10.6
5	94.07±4.77	100.83±5.14	93.73±3.14
10	97.87±3.32	105.73±7.62	99.07±2.80
20	105.2±7.02	112.3±8.68	102.77±4.6
30	110.87±6.38	118.87±6.23	101.37±1.77
60	119.2±19.64	106.03±5.84	102.4±2.03
90	123.67±5.83	126.2±8.52	102.3±1.56
120	122.73±21.22	130.3±5.9	102.27±1.91
150	99.53±9.48	123.27±5.7	98.7±2.03
180	108.13±8.39	121.3±6.7	101.57±2.05
210	110.6±9.62	122.67±6.2	102.1±1.58
240	115.27±9.12	124.67±5.6	103.27±2
270		125.6±8.4	105.03±1.81
300		130.87±7.40	105.2±2.16
330			108.8±8.67
360			108.93±9.3
Total	111.17±9.2	119.64±6.89	103.82±3.63

From the table it can be seen that there was an initial fall of B.P. (>10 15% drop from baseline value) after 5 min of spinal injection in patients of group-1 , but it returned to the baseline value within an hour, whereas in patients of group-ll there was a moderate fall of B.P. (10-15% drop from baseline value) which gradually returned to baseline value within an hour, whereas in agter 5 min of spinal block but B.P does not rise to baseline value but sustained the accepted limit after treatment with vasopressors. Whenever there was significant fall of BP, vasopressor support was established.

Table 7:Pulse Rate At Different Time Intervals

Time (in mm)	Pulse	Rate (per mm)	
	Group-1	Group-ll	Group-lll
0	90.73±10.43	93±6.7	84.93±8.4
5	94.07±4.77	98.87±5.52	82.47±9.2
10	97.47±7.06	98.6±6.3	80.5±10.13
20	94.77±5.50	99.6±5.34	80.2±12.2
30	99.3±5.50	100.6±4.82	81.7±15.8
60	98.1±5.42	95.4±3.8	78.87±12.3
90	94.07±9.58	97.07±5.1	77.53±10.88
120	89.8±10.70	98.6±7.25	79.93±11.66
150	101.13±7.5	99.3±5.6	79.47±10.74
180	100.4±5.17	98.97±5.95	79.67±11.87
210	100.87±6.22	98.03±7.7	79.4±11.87
240	101.93±5.64	96.73±7.38	81.8±12.5
270		95±7.8	83±12.28
300		97.5±8.42	82.13±10.05
330			85.27±8.95
360			86.27±8.5
Total	96.89±6.97	97.66±6.19	81.45±11.06

It is evident from the above table that the values do not differ significantly between the compared drug group (P>0.05).

Table 8:Respiratory Rate At Different Time Intervals

Time (in mm)	Respiratory Rate (Per min) Rate (per mm)		
	Group-1	Group-ll	Group-lll
0	17.33±1.92	17.3±1.68	15.97±0.85
5	17.17±1.58	17.2±1.7	16.17±1.29
10	17.87±1.36	17.6±1.6	16.4±1.25
20	17.83±1.6	17.37±1.61	16.37±1.03
30	17.03±1.27	17.33±1.54	16.43±1.07
60	16.73±2.07	17.2±1.42	16.27±1.1
90	17.73±2.46	17.3±1.78	16.03±1.1
120	16.53±1.38	17.53±1.61	16.03±1.1
150	17.63±1.6	17.57±1.6	15.9±1.0
180	17.93±2.7	17.43±1.5	16.3±0.88
210	16.97±1.73	17.6±1.4	16.4±1.13
240	16.83±1.53	17.5±1.7	16.3±0.99
270		17.83±1.4	16.17±1.0
300		17.5±1.8	16±0.95
330			16.13±0.94
360			16.27±0.7
Total	17.3±1.77	17.45±1.65	16.2±1.02

It is evident from the table that the values do not differ significantly between the compared drug groups (P> 0.05).There was no evidence of respiratory depression (R.R. < 10/min) either intraoperatively or postoperatively.

Table 9:Side Effects

S.No.	Side Effects	Groups						P Value
		Group-1(n=30)		Group-ll(n=30)		Group-lll(n=30)		
		No	%	No	%	No	%	
1	Nausea Vomiting	18	60	11	36.66	5	16.66	P<0.05
2	Shivering	4	13.3	5	16.66	6	20	N.S
3	Pruritus	0	0	11	36.66	0	0	N.S
4	Bradycardia	0	0	0	0	5	16.66	P>0.05
5	Respiratory Depression	0	0	0	0	0	0	Not Significant
6	Rigidly	0	0	0	0	0	0	N.S
7	Sedation	0	0	0	0	8	26.66	P>0.05
8	Dry Mouth	0	0	0	0	4	13.33	N.S

It is evident from the table that nausea and vomiting were more pronounced in the group l (P< 0.05). But the incidence of pruritus was higher in group ll. The incidence of urinary retention could not be assessed as the patients undergoing surgery were preoperatively catheterized. There were no incidences of respiratory depression or muscle rigidity in all the three study groups. But the incidence of bradycardia and sedation was higher in the group-lll. Sedation score was grade 2 in all the patients of group-lll.

Table 10: Post-operative pain scoring chart (vas chart)Vas chart

S.No.	Time (in mm)	VAS Score		
		Group-1	Group-ll	Group-lll
1	120	1.4±0.62	0.77±0.73	
2	150	2.33±0.61	1.83±0.7	
3	180	3.4±0.77	2.57±0.38	0.73±0.7
4	210	4.9±0.48	3.3±0.7	1.03±0.7
5	240	5.17±0.38	4.27±0.64	2.07±0.7
6	270		4.8±0.71	2.27±0.56
7	300		5.37±0.5	2.67±0.6
8	330			2.73±0.53
9	360			2.97±0.47
	Total	3.44±0.57	3.27±0.67	207±0.87

It is evident from the table that patients In the group lll had low VAS score (low pain score)(P<0.05), significantly less than group ll

Results There was no statistical difference was observed in the time of onset of sensory and motor block. In comparison to the other two group, the duration of sensory and motor block was significantly more in group lll where clonidine was added to hyperbaric bupivacaine intrathecally. There was significant prolongation of effective ananlgesia in group lll i.e. the requirement of rescue analgesic was delayed when compared to group ll& group l. There was significant fall in BP in group lll but it was sustained at the accepted limit after treatment with vasopressors in the intraoperative and postoperative period as compared group ll and group l . There was a reduced incidence of nausea and vomiting in group lll but mild sedation and low incidence of bradycardia was found.The VAS score for postoperative pain score was significantly less in group lll in comparison to the other 2 groups.

Statistical Analysis

Data was compiled using MS excel 2007 and analysis was done with the help of Epi-Info 7 software. Frequency and percentage were calculated & statistical test (Chi Square) was applied wherever applicable. Comparison of quantitative data between groups was done by unpaired t-test. Observations duly recorded, have been

tabulated and statistically analyzed in this section. Comparison of quantitative data between groups was done by unpaired t-test. A p<0.05 was considered clinically significant.

Discussion

Adjuvants are compounds which by themselves have undesirable side-effects or low potency but in combination with opioids allow a reduction of narcotic dosing for postoperative pain control. Adjuvants are needed for postoperative pain management due to side-effects of opioid analgesics, which hinder recovery, especially in the increasingly utilized ambulatory surgical procedures.Inneuraxial anaesthesia, both opioids and alpha-2 receptor agonists have beneficial effects. Intrathecally, fentanyl and sufentanil not only improve the postoperative analgesia but also make it possible to allow a decrease in the local anaesthetic dose. When clonidine or dexmedetomidine was added to intrathecal local anaesthetics, the regression of sensory, motor block increased dose-dependently and postoperative analgesia was prolonged. Axelsson K studied role of local anaestheticadjuvents and concluded that opioids and alpha-2 receptor agonists are important as neuraxial adjuvants to improve the quality of peroperative and postoperative analgesia in high-risk patients and in ambulatory procedures. [4]

Buvanendran A et al also elaborated on useful adjuvants for postoperative pain management. Alpha-2 adrenergic agonists cause sedation, hypotension and bradycardia at moderate doses, but at low doses can be opioid sparing especially in spinal administrationNewer adjuvants will be needed to reduce opioid dose and concomitant side-effects, even more as same day surgeries become more routine.[5]

Chu CC et al studied the effect of intrathecal bupivacaine with combined fentanyl in cesarean section. Fentanyl , if administered intrathecally, its onset is fast and many of its merits by virtue of its lipophilic property may be seen intraoperatively.They concluded that the combination of bupivacaine with a dose of fentanyl as low as 7.5 micrograms did not produce actual clinical effects. As the dose of fentanyl was increased to 12.5 micrograms or 15 micrograms the quality of surgical analgesia was better and the postoperative analgesia lasted longer. It seemed that the clinical effect might reach its ceiling at the dose of 12.5 micrograms. Pruritus was the most common side effect, but it was mild.[6]Nadeem MM et al studied hemodynamic response of low dose bupivacaine with fentanyl spinal anesthesia in elderly patients.All patients had adequate duration of block. There was no significant difference in the change of heart rate between the two groups. Fall in blood pressure was more pronounced in the control group (group-B) patients requiring more ephedrine as compared with the study group (group-A) patients which remained more hemodynamicallystable.So it was concluded that reduced dose of hyperbaric bupivacaine in combination with fentanyl provides reliable spinal anesthesia in elderly patients with few events of hypotension and little need for vasopressor support of blood pressure.[7]

Similar study was done by Kelly M et al who saw the impact of intrathecal fentanyl on hospital outcomes for patients undergoing primary total hip arthroplasty .The administration of intrathecal fentanyl does not have a significant effect on early postoperative narcotic consumption, length of stay, 90-day readmissions, or recatheterization after THA with neuraxial anesthesia. In contrast to other stuIntrathecal fentanyl does not appear to improve outcomes and should not be included as a standard element of THA rapid recovery protocols.[8]

Efforts to find a better adjuvant in regional anaesthesia are underway since long. Aims and objectives are to compare the efficacy and clinical profile of two α-2 adrenergic agonists, dexmedetomidine and clonidine, in epidural anaesthesia with special emphasis on their sedative properties and an ability to provide smooth intra-operative and post-operative analgesia. A prospective randomized study was carried out by Bajwa SJ et al which included 50 adult female patients who underwent vaginal hysterectomies. The patients were randomly allocated into two groups; ropivacaine + dexmedetomidine (RD) and ropivacaine + clonidine (RC). The demographic profile, initial and post-operative block characteristics and cardio-respiratory parameters were comparable and statistically non-significant in both the groups. However, sedation scores with dexmedetomidine were better than clonidine and turned out to be statistically significant ($P < 0.05$). Dexmedetomidine is a better neuraxial adjuvant compared to clonidine for providing early onset of sensory analgesia, adequate sedation and a prolonged post-operative analgesia .[9]The aim of the study by Klimscha W et al was to compare hemodynamic and analgesic effects of spinal versus epidural clonidine alone and after repetitive dosing. In a prospective, randomized, double-blind study, they evaluated 40 patients scheduled for lower extremity orthopedic surgery under continuous spinal or epidural anesthesia .Mean arterial pressure (MAP) and heart rate were recorded for 6 h after each injection. Duration of clinically useful anesthesia was defined as the time from drug administration to first sensation of pain. Intrathecal, but not epidural, clonidine decreased MAP significantly compared with bupivacaine alone. MAP after intrathecal clonidine with bupivacaine was lower than epidural clonidine with bupivacaine 5 and 6 h after injection. Repetitive administration caused no further decrease in MAP. Onset time required to surgical anesthesia (sensory block of T11) did not differ among the four groups. Duration of spinal and epidural anesthesia was increased more than two fold by clonidine. In summary, the addition of clonidine prolongs analgesia by either route. [10]

Bonnet F et al studied the effects of oral and subarachnoid clonidine on spinal anesthesia with bupivacaine. The comparative effects of oral and subarachnoid clonidine on spinal anesthesia with bupivacaine were studied in 36 patients scheduled for orthopedic surgery. Only the subarachnoid administration of clonidine achieves adequate concentrations to significantly increase the duration of spinal anesthesia.[11]

Sarma J did a comparative study of intrathecal clonidine and dexmedetomidine on characteristics of bupivacaine spinal block for lower limb surgeries.It has improved the quality of spinal anesthesia, this clinical study was undertaken to assess the behavior of intrathecal clonidine as an adjuvant to bupivacaine in augmenting sensory block in patients undergoing lower limb surgeries.It was concluded that supplementation of bupivacaine spinal block with a low dose of intrathecaldexmedetomidine (5 µg) or clonidine (50 µg) produces a significantly shorter onset of motor and sensory block and a significantly longer sensory and motor block than bupivacaine alone.[12]

Solanki SL et al did a randomised, double-blind study to compare the duration of analgesia and adverse effects following intrathecal administration of dexmedetomidine or clonidine, both with bupivacaine, in trauma patients. The onset and duration of sensory and motor blockade, severity of postoperative pain, time to first rescue analgesia and total analgesic requirement for 24 hours were noted. There was no significant difference in the onset time of the block but the duration of sensory and motor blockade was prolonged in Groups Clonidine and dexmedetomidine , compared with Group Bupivacaine. In conclusion, dexmedetomidine 5 µg added to intrathecal bupivacaine 15 mg produces longer postoperative analgesia than clonidine 50 µg among trauma patients undergoing lower limb surgery.[13]

The purpose of this study by Kanazi GE et al was to study the effect of low-dose dexmedetomidine or clonidine on the characteristics of bupivacaine spinal block and to compare the onset and duration of sensory and motor block, as well as the hemodynamic changes and level of sedation. The onset times to reach peak sensory and motor levels, and the sensory and motor regression times, were recorded. Hemodynamic changes and the level of sedation were also recorded.Conclusions were thatdexmedetomidine (3µg) or clonidine (30µg), when added to intrathecal bupivacaine, produces a similar prolongation in the duration of the motor and sensory block with preserved hemodynamic stability and lack of sedation.[14]Tarbeeh

GA did a similar study like us studing the effects of intrathecal bupivacaine–fentanyl versus bupivacaine–dexmedetomidine in diabetic surgical patients. Sixty diabetic patients of either sex were submitted for elective lower limb orthopedic surgery. Patients were randomly allocated into three equal groups.The duration of sensory and motor block as well as duration of effective analgesia was significantly longer in the bupivacaine–dexmedetomidine group as compared with both bupivacaine–fentanyl and control bupivacaine groups. [15]

Conclusion

To conclude, the combination of group lll drugs i.e. 0.5% hyperbaric bupivacaine +150µg clonidine intrathecally is found better as it provides better postoperative analgesia and fewer side effects as compared to group l & group ll in the present study.

What This Study Add to Existing Knowledge

Neuraxial anesthesia can provide a safer perioperative experience, greater satisfaction, reduced opioid consumption, and reduction of pain, while minimizing side effects. Adjuvants are medications that work synergistically with local anesthetics to help enhance the duration and quality of analgesia in regional techniques. Practitioners in the perioperative setting need to not only be familiar with regional techniques but also the medications used for them.There are a plethora of adjuvants that have been utilized to prolong local anesthetic actions and enhance effects in peripheral nerve blocks. Regional adjuvants can improve patient safety, increase patient satisfaction, and enhance clinical efficacy. Future studies and best practice techniques can facilitate standardization of regional anesthesia adjuvant dosing when providing nerve blocks in clinical practice.

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