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An Observational Study of Adductor Canal Block Using Ropivacaine Alone and with Additives (Dexmedetomidine / Fentanyl) for Post Operative Analgesia in Patients Undergoing Knee Arthroscopic Surgeries

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KEYWORD
Knee arthroscopy, Adductor canal block, ropivacaine, Fentanyl, Dexmedetomidine, Post-operative analgesia, VAS.

ABSTRACT:
Background: Knee arthroscopy surgery is associated with severe post-operative pain. Multimodal analgesia facilitates early ambulation and rehabilitation, reduced hospital stay and cost of treatment and increased patient satisfaction.
Aim: To assess the post-operative analgesia in adductor canal block in knee arthroscopy and ccompare the longevity and density of the block in plain ropivacaine with dexmedetomidine and fentanyl as additives.
Methods: In this observational study patients of either sex in the age group of 18-75 years, having body mass index (BMI) of 20-35 kg/m^2 and belonging to ASA (I & II), who were scheduled to undergo elective knee arthroscopic surgeries were included. A detailed history, thorough physical examination and relevant laboratory investigation were conducted in all patients. On the evening before surgery, the visual analogue scale (VAS) Scoring was explained to all patients. Patients were categorized into three group's viz. **GROUP A:** patients received 20ml of 0.2% Ropivacaine + 2ml of Normal Saline (Total 22ml). **GROUP B:** patients received 20ml of 0.2% Ropivacaine + 0.25mcg/kg of Dexmedetomidine diluted in 2ml of Normal Saline (Total 22ml). **GROUP C:** patients receiving 20ml of 0.2% Ropivacaine + Fentanyl 1mcg/kg diluted in 2ml of Normal Saline (Total 22ml).
Results: There was no significant difference in demographic profile of the patients among various groups. Difference in the duration of analgesia was statistically significant among the three groups with longest duration in Group C (7.6±1.20 hours) followed by Group B (5.4±1.52 hours) and was least in Group A (4.3±1.70 hours), (p value<0.01). In our study fentanyl (1mcg/kg) has proven to be better than dexmedetomidine (0.25mcg/kg), as we have used a lower concentration of dexmedetomidine. Total consumption of analgesia (Injection Tramadol 1mg/kg, IV) over a period of 24 hours in Group A was 200±28.76mg, Group B was 142±41.53mg and Group C was 108.9±30.64mg. Total quantity of rescue analgesia consumed was maximum in Group A followed by Group B and was least in Group C among the three study groups (P value <0.001).
Conclusion: we conclude that addition of 1mcg/kg fentanyl to ropivacaine showed significantly better duration of postoperative analgesia in comparison to 0.25mcg/kg dexmedetomidine, without causing any significant side effects.

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INTRODUCTION

Different categories of pain can be defined according to the duration, etiology, or perception of the painful experience which include acute pain, chronic pain, neuropathic pain, nociceptive pain and inflammatory pain[1]. For an anesthesiologist, pain control is a significant part of delivering a safe and balanced anaesthesia[2].One of the common complaints in postoperative period is acute postoperative pain.

Knee arthroscopy is a common orthopedic procedure worldwide.[3,4]Despite its minimally invasive nature compared to the traditional knee surgery, post-arthroscopic pain may be severe, and the patients generally require a significant amount of opioid-based analgesics after such procedures. Several patients experience narcotic-related complications, such as sedation, respiratory depression, nausea, vomiting and constipation following excessive use of opioid analgesics. Peripheral nerve blocks offer effective analgesia and decrease the need for opioids, thereby reducing the complications associated with the use of this class of drugs.[5-8] Other benefits of peripheral nerve blocks include reduction in hospital resource utilization,[9,10] improved postoperative recovery,[9,11,12] and improvement in patient satisfaction.[13] Moreover, postoperative pain relief is an important factor in the early ambulation and rehabilitation of patients after knee surgery.[7,14]

Contemporary pain management regimens following arthroscopic knee surgery include oral analgesics, periarticular injection, local anaesthetic infiltrations, peripheral nerve blocks (PNBs), and intravenous patient-controlled analgesia (PCA).[15-18]Multimodal analgesia is achieved by combining different analgesics that act by different mechanisms and at different sites in the nervous system, resulting in additive or synergistic analgesia with lowered adverse effects of sole administration of individual analgesics.[19] As peripheral nerve block (PNB) provide effective and synergistic pain relief when used as part of a multimodal regimen, they are considered to be an essential part of the current multimodal pain management protocol following arthroscopic knee surgery.[20-23]

Given excellent pain relief and the opioid sparing effect, femoral nerve block (FNB) is commonly used as an analgesic modality and is considered the standard PNB in patients undergoing arthroscopic knee surgery.[24] However, FNB is followed by a significant decrease in quadriceps muscle strength, resulting in delayed mobilization, which is associated with the potential risk of falling.[23,25-29] Adductor canal block (ACB) is a highly successful approach to the saphenous nerve (also known as saphenous nerve block), that was first described by Vander Wal et al.[30] Compared with FNB, ACB results in less reduction in the quadriceps muscle strength as only the motor nerve to the vastus medialis of the quadriceps muscle traverses the adductor canal.[5]

Adductor canal block can be performed using variety of short and long acting local anesthetics in varying concentrations. In general, the duration of action is affected by the concentration of the local anesthetic as well as the volume injected. Duration of action can also be prolonged with additives such as epinephrine or a corticosteroid, typically dexamethasone.[31] Bupivacaine and ropivacaine are most commonly used long-acting local anesthetic agents. Bupivacaine has the risk of cardiotoxicity causing hypotension, arrhythmias and even cardiac arrest. Ropivacaine has very close pharmacodynamic profile to equipotent doses of bupivacaine. They have similar anesthetic and analgesic effects. The benefit of ropivacaine is its lower risk of cardiotoxicity in the event of inadvertent intravascular injection, significantly faster onset time and higher therapeutic index leading to an improved safety profile.[32]

Ultrasound imaging is rapidly emerging as a very promising regional anaesthesia tool since the size, depth and precise location of many nerves in their surrounding environment can be determined with correct interpretation of the visual image. The proposed benefits of Ultrasound guidance, as compared to nerve stimulation, for peripheral nerve improved block success rate,[33] reduced block performance time and onset time,[3,18,44] prolonged duration of blocks and lead to reduction in complications (intravascular injection, local anesthetic toxicity, and a failed block).[30]

When inserted to perform a block, the needle may be visualized dynamically with the use of either an "in-plane" or "out-of-plane" approach. An in-plane approach is performed when the needle is parallel to the long axis of the transducer (LOX). An out-of-plane approach is performed when the needle is perpendicular to the long axis of the transducer or parallel to the short axis (SOX). An out-of-plane approach may overestimate or underestimate the depth of the needle (Marhofer 2010).

The needle axis must be parallel and also aligned with the axis of the probe. When injecting, local anesthetic spread must be monitored. If anesthetic spread is not seen, intravascular injection or poor visualization must be excluded. The more the needle is parallel to the transducer, the more the echoes will be captured from the transducer and the needle visualized.

Dexmedetomidine, a highly selective alpha 2 adrenergic agonist with a relatively high ratio of alpha 2 / alpha 1 activity [1620:1 as compared to 220:1 for Clonidine] possesses all these properties but lacks respiratory depression making it a useful and safe adjunct in diverse clinical applications[34,35].

Fentanyl is significantly bound to red blood cells,

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approximately 40%, and has a blood: plasma partition coefficient of approximately one. The lungs exert a significant first-pass effect and transiently take up 75% of an injected dose. Fentanyl protein binding is pH-dependent, such that a decrease in pH will increase the proportion of fentanyl that is unbound. Thus, a patient with respiratory acidosis will have a higher proportion of unbound (active) fentanyl, which could exacerbate respiratory depression[36-38].

The objective of present study was to compare the block of femoral nerve at adductor canal using ropivacaine with additives like dexmedetomidine and fentanyl with regard to longevity and density of the block in comparison to plain ropivacaine. Dexmedetomidine has been used in many studies as an additive to local anesthetics for peripheral nerve blocks with good results[39-41]. Opioids are used as antinociceptive agents in peripheral nerve blockade.[42-45]

AIMS AND OBJECTIVES

1. Assess the post-operative analgesia in adductor canal block in knee arthroscopy.
2. Compare the longevity and density of the block in plain ropivacaine with dexmedetomidine and fentanyl as additives.
3. Compare the additive dexmedetomidine and fentanyl regarding the effect on length and density of block.

MATERIAL AND METHODS

This study was an Observational study and was conducted from November 2018 to October 2020 in the Bone and Joint Hospital, an associated hospital of Government Medical College, Srinagar, during routine working hours for various elective knee arthroscopic surgical procedures.

SELECTION OF CASES

After obtaining proper approval of the Institutional Ethical Committee an informed consent was obtained from all the patients who were to be observed during the study. Patients of either sex in the age group of 18-75 years, having body mass index (BMI) of 20-35 kg/m^2 and belonging to ASA (I & II), who were scheduled to undergo elective knee arthroscopic surgeries were observed in this study. A detailed history, thorough physical examination and relevant laboratory investigation were conducted in all patients. On the evening before surgery, the visual analogue scale (VAS) Scoring was explained to all patients.

All the included patients were categorized into three groups viz. **GROUP A:** patients received 20ml of 0.2% Ropivacaine + 2ml of Normal Saline (Total 22ml). **GROUP B:** patients received 20ml of 0.2% Ropivacaine + 0.25mcg/kg of Dexmedetomidine diluted in 2ml of Normal Saline (Total 22ml). **GROUP C:** patients receiving 20ml of 0.2% Ropivacaine + Fentanyl 1mcg/kg diluted in 2ml of Normal Saline (Total 22ml).

THE EXCLUSION CRITERIA:

- known allergy to any of the study drugs
- patients on recent oral opioids in the last 3 months
- pregnancy
- patients in whom the nerve block could not be performed as per the methodology.
- Patients having any cognitive dysfunction
- patient with severe peripheral vascular and neurological disease

ANAESTHETIC TECHNIQUE

All patients were premedicated with oral diazepam (10mg) administered on the night prior to surgery as night sedation. On the day of surgery, all patients were premedicated with injection pantoprazole 40mg i/v and injection midazolam 1mg i/v in the holding up area before transferring the patients to operating room and baseline hemodynamic parameters viz. HR, SpO_2, NIBP and ECG (Standard chest leads) were recorded. All patients were anesthetized using a Standardized Subarachnoid block (SAB) by injecting 3.5ml of 0.5% Bupivacaine in L3-4 space through 25G quinkes spinal needle in sitting position. After confirming the level of block, the patients were handed over to surgical team and hemodynamic parameters were recorded at specified time intervals. After completion of surgery patients received Adductor Canal Block (ACB) for post-operative analgesia using ultrasound guided technique. Postoperative analgesia was assessed using Visual Analogue Scale (VAS) of 0 to 10 with (0 = no pain) and (10 = worst imaginable pain). Patients were assessed 2 hourly for first 12 hours post operatively and then 4 hourly upto 24 hours. Rescue analgesia using Tramadol 1mg/kg (i/v) was administered anytime the VAS was found ≥3. Sedation score was assessed by using Ramsay Sedation Score (RSS).Frequency and total dose of rescue analgesia received and side effects such as nausea and vomiting were recorded over the 24 hour period. Vital signs viz. HR, NIBP, SpO_2 and ECG were continuously monitored and recorded on two hourly basis for 12 hours post operatively and then 4 hourly upto 24 hours.

RAMSAY SEDATION SCALE

Score	Response
1	Anxious and agitated or restless or both
2	Cooperative, oriented and tranquil
3	Responds to commands only
4	Brisk response to a light glabellar tap or loud auditory stimulus
5	Sluggish response to a light glabellar tap or loud auditory stimulus

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6 No response to a light glabellar tap or loud auditory stimulus

Statistical Methods: The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Statistical software SPSS (version 20.0) and Microsoft Excel were used to carry out the statistical analysis of data. Continuous variables were expressed as Mean±SD and categorical variables were summarized as percentages. Student's independent t-test was employed for comparing continuous variables. Chi-square test or Fisher's exact test, whichever appropriate, was used for comparison of categorical variables. Graphically the data was presented by bar and line diagrams. A P-value of less than 0.05 was considered statistically significant. All P-values were two tailed.

RESULTS

The parameters studied were duration of analgesia, total analgesia consumed in 24 hours, hemodynamic parameters, and any adverse drug effects. Pain was assessed using Visual Analogue Scale (VAS) of 0 to 10 with (0 = no pain) and (10 = worst imaginable pain). Sedation score was assessed by using Ramsay Sedation Score (RSS). There was no significant difference in demographic profile of the patients among various groups [Table 1]. Difference in the duration of analgesia was statistically significant among the three groups with longest duration in Group C (7.6±1.20 hours) followed by Group B (5.4±1.52 hours) and was least in Group A (4.3±1.70 hours), (p value<0.01) [Table 3].

Visual analogue scale was found highest in group A and lowest in group C. Median VAS score of group C was statistically significantly lower than median VAS score of group B and median VAS score of group B was statistically significantly lower than group A. This suggests that the addition of dexmedetomidine and fentanyl as adjuvants to ropivacaine has prolonged the analgesic effect of ropivacaine. Although in our study fentanyl (1mcg/kg) has proven to be better than dexmedetomidine (0.25mcg/kg), as we have used a lower concentration of dexmedetomidine. Total consumption of analgesia (Injection Tramadol 1mg/kg, IV) over a period of 24 hours in Group A was 200±28.76mg, Group B was 142±41.53mg and Group C was 108.9±30.64mg [Table 3]. Total quantity of rescue analgesia consumed was maximum in Group A followed by Group B and was least in Group C among the three study groups (P value <0.001).

Incidences of side effects in the subjects were insignificant and only few side effects were noted like, 3.4% of patients in Group A had nausea. 3.2% patients in Group C had vomiting. Bradycardia was noted in 3.4% in Group A, 5.9% in Group B and 3.2% in Group C. 2.9% patients had hypotension in Group B while as 3.2% patients had hypotension in Group C. (P value >0.05) [Table 4].All the study subjects were hemodynamically stable during the post-operative period and the difference among the various variables like heart rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure were statistically insignificant.

Table 1: Postoperative vitals (pre-block) among various groups

Parameter	Group A		Group B		Group C		P-value
	Mean	SD	Mean	SD	Mean	SD	
HR (bpm)	91.310	8.665	92.206	8.654	88.161	9.494	0.172
SBP (mmHg)	124.759	11.688	124.824	10.173	125.419	9.629	0.963
DBP (mmHg)	78.241	7.366	77.059	5.825	78.613	6.500	0.607
MAP (mmHg)	93.752	8.234	92.974	6.401	94.213	6.796	0.778
SPo2 (%)	95.828	1.365	95.912	1.264	95.806	1.195	0.939

Table 2: Comparison based on duration of analgesia (hours) among various groups

Groups	Mean (Hours)	SD	95% CI	Range	Comparison	P-value
Group A	4.3	1.70	3.70-4.99	2-6	A vs B	0.005*
Group B	5.4	1.52	4.88-5.94	4-8	B vs C	<0.001*
Group C	7.6	1.20	7.17-8.05	6-10	A vs C	<0.001*

Table 3: Comparison based on total analgesic (IV Tramadol) consumption (mg) among various groups

Groups	Mean (mg)	SD	95% CI	Range	Comparison	P-value
Group A	200.2	28.76	189.2-211.1	156-300	A vs B	<0.001*
Group B	142.7	41.53	128.2-157.2	58-204	B vs C	<0.001*
Group C	108.9	30.64	97.7-120.1	58-140	A vs C	<0.001*

Table 4: Comparison based on side effects among various groups

Side effects	Group A		Group B		Group C		P-value
	No.	%age	No.	%age	No.	%age	
Nausea	1	3.4	0	0.0	0	0.0	0.364

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Vomiting	0	0.0	0	0.0	1	3.2	0.364
Bradycardia	1	3.4	2	5.9	1	3.2	0.769
Hypotension	0	0.0	1	2.9	1	3.2	0.599

DISCUSSION

In our study we have used local anesthetic ropivacaine (0.2%, 20ml). Since it is lipophilic and therefore is less likely to penetrate large myelinated motor fibres[46]. Hence theoretically it has lesser motor blockade in ACB, so it is hypothesised that it will facilitate early ambulation after surgery. Our hypothesis is supported by Manisha et al (2020) in a study who used (0.5% ropivacaine 30 ml)[47] for ACB.

In our study we have used adjuvants dexmedetomidine and fentanyl in order to prolong the duration of analgesia, and reduce the total dose of rescue analgesia. Murphy et al. and Brummett et al in their studies on administration of dexmedetomidine as an adjuvant to local anesthetics reported that the mechanism of the analgesic effect of dexmedetomidine is still not clear and may be multifactorial.[48,49] Possible mechanism of action of dexmedetomidine is that it induces vasoconstriction through an action on α2 adrenoceptors or it produces analgesia peripherally by reducing norepinephrine release and increasing the potassium conduction in C and A-delta neurons responsible for passage of pain stimulus, whereas it produces analgesia and sedation centrally by inhibition of substance P release in the nociceptive pathway at the level of the dorsal root ganglia and locus ceruleus as hypothetized mechanisms explained by Lee et al. (2016), Talke et al. (2003), and Yoshitomi et al. (2008) in their studies[50-52]. Rajkhowa et al. (2016) proposed that the mechanism of fentanyl in prolongation of analgesia may be due to the existence of peripheral functional opioid receptors, but the existence of opioid receptor in peripheral tissue is still doubtful.[11] Furthermore, Rajkhowa et al. mentioned in their study that fentanyl used with ropivacaine prolonged the duration of sensory and motor blockade, probably by directly binding with opioid binding sites on the dorsal nerve roots aided with these axonal transports or by diffusing into surrounding tissues and subsequently into the epidural and subarachnoid spaces; it may also have a central opioid receptor mediated action after systemic absorption of fentanyl.[53]Taking all this into consideration about dexmedetomidine and fentanyl, we conducted an observational study in which we compared 0.25mcg/kg of body weight dexmedetomidine and 1mcg/kg of body weight fentanyl as an adjuvant to ropivacaine in ACB, with patients who received only 0.2% of ropivacaine (20 ml) in ACB. The various parameters we studied were duration of post-operative analgesia among the three groups, amount of rescue analgesia consumed, postoperative hemodynamic parameters and any adverse effects during postoperative period.

In our study we found that the mean duration of postoperative analgesia was 4.3$\pm$1.70 hours in Group A (Ropivacaine alone group), 5.4$\pm$1.52 hours in Group B (Ropivacaine + Dexmedetomidine) and 7.6$\pm$1.20 hours in Group C (Ropivacaine + Fentanyl). Difference in duration of analgesia among three groups was compared, it was found to be statistically highly significant. Duration of analgesia was longer in Group B than in Group A and was statistically significant ($p<0.005$ A vs B) and duration was also longer in Group C than in Group B ($p<0.001$ B vs C). So there was statistically significant difference in analgesia among adjuvant groups as compared to plain ropivacaine and among adjuvant groups Group C was longer. Our results as far as using dexmedetomidine as adjuvant are similar with the results Goyal R et al (2017)[54]who conducted a study on adductor canal block analgesia after bilateral total knee replacement, they found an increased duration of analgesia on using dexmedetomidine as adjuvant. Duration was more prolonged in the group containing 0.5mcg/kg dexmedetomidine as an additive when compared with group containing 0.25mcg/kg dexmedetomidine as additive. Abdulatif M et al in 2016[55] also found in their double blinded study that duration of analgesia is prolonged when they used a dose of 25mcg, 50mcg and 75mcg of dexmedetomidine as adjuvant. The use of 75mcg, 50mcg dose levels resulted in prolonged duration of analgesia, as compared to 25mcg of dexmedetomidine. Similar results were found by Sharma et al in 2016[56]who conducted a double blinded RCT for total knee arthroplasty using 1.5mcg/kg dexmedetomidine as adjuvant to ropivacaine. Aboelala MA et al in 2018[57], conducted a double blinded RCT study in donor hepatectomy surgery in which he used 0.35mcg/kg dexmedetomidine as an adjuvant to bupivacaine and found prolonged postoperative analgesia in the group in which dexmedetomidine was used as an adjuvant. Our results are also in accordance with that of Farooq N et al 2017[58]who conducted a study in which they compared dexmedetomidine (1mcg/kg) and fentanyl (1mcg/kg) as adjuvants to local anesthetic, in their study they also found that fentanyl was a better adjuvant as compared to dexmedetomidine and resulted in more prolongation of duration of analgesia. Our study is also in accordance with Kaniyil S et al (2016)[59], who in a study used fentanyl as an adjuvant to local anesthetic and found that it significantly prolonged the duration of analgesia. Rajkhowa et al (2016)[53] also mentioned in their study that fentanyl when used as an adjuvant to ropivacaine resulted in prolonged duration of analgesia. Hassan S et al in 2018[60] also concluded that when fentanyl was used

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as an adjuvant to local anesthetic resulted in prolongation of duration of analgesia. Chen Q et al in 2018[61] conducted a study in which they also compared dexmedetomidine (1mcg/kg) and fentanyl (1mcg/kg) as adjuvants to local anesthetic, they found that dexmedetomidine was a better adjuvant as compared to fentanyl and resulted in more prolongation of duration of analgesia, but in this study they used a concentration of 1mcg/kg dexmedetomidine as compared to our study in which we used only 0.25mcg/kg dexmedetomidine. Taher-Baneh B et al in 2019[62] studied effects of fentanyl and dexmedetomidine as adjuvant to bupivacaine. However, they also concluded that fentanyl is more effective than dexmedetomidine which is in accordance with our results.

In our study, the visual analogue scale (VAS) was lowest and statistically significant in patients who received fentanyl (1mcg/kg) as adjuvant to ropivacaine as compared to patients who received dexmedetomidine (0.2mcg/kg) as adjuvant and was highest among three groups in patients who received plain ropivacaine only. Total analgesic consumption of (injection tramadol 1mg/kg, i/v) in 24 hours postoperatively was 200$\pm$28.76 mg in Group A, 142$\pm$41.53 mg in Group B, 108$\pm$30.64 in Group C. Difference in analgesic consumption in 24 hours was statistically significant between Group A, Group B and Group C (P value < 0.001). Analgesic consumption was maximum in Group A, lower in Group B and least in Group C. Goyal R et al (2017)[54] conducted a study on Adductor canal block for post-operative analgesia after simultaneous bilateral total knee replacement using dexmedetomidine as an adjuvant to local anesthetic. In their study, they found that the total analgesia consumption was lower in patient receiving 0.5mcg/kg of dexmedetomidine as compared to group which received 0.2mcg/kg.Farooq N et al in 2017[58] who also found that low analgesia was consumed in 24 hours postoperatively in group containing 1mcg/kg fentanyl as compared to 1mcg/kg dexmedetomidine as an adjuvant.

The baseline heart rate was 91.310$\pm$8.665, 92.206$\pm$8.654 and 88.16$\pm$9.494 per minute in Group A, B and C respectively. The mean heart rate was comparable and no statistical difference was found among the three groups at different time interval after the surgery (p value >0.05) The baseline systolic blood pressure was 124.7$\pm$11.688, 124.8$\pm$10.173 and 125.4$\pm$9.629 per mm of Hg in Group A, B and C respectively. The postoperative systolic blood pressure was comparable with no statistically significant difference among the three groups at different time interval after the surgery (p value >0.05). The baseline diastolic blood pressure was 78.241$\pm$7.366, 77.059$\pm$5.825 and 78.613$\pm$6.500 per mm of Hg in Group A, B and C respectively. The postoperative diastolic blood pressure was comparable with no statistically significant difference among the three groups at different time interval after the surgery (p value >0.05).On comparing the mean arterial blood pressure in subjects of all the three groups at baseline, it was comparable with no statistically significant difference among the three groups at different time interval after the surgery (p value >0.05)

On comparing the mean SpO_2 in subjects of all the three groups, baseline was comparable during the postoperative period, we found no significant difference among the three groups (p value >0.05). Goyal R et al in 2017[54] in their study also found that heart rate, blood pressure, SpO_2 were comparable between the groups 0.5mcg/kg and 0.2mcg/kg of dexmedetomidine when added as an adjuvant. Sahi P et al in 2018[63]also found that heart rate, blood pressure and spo2 were comparable in all the three groups, on addition of dexmedetomidine 1mcg/kg and fentanyl 1mcg/kg as additives to ropivacaine.Hassan S et al in 2018[60] also found statistically insignificant differences in hemodynamic parameters among the groups.

Majority of patients in the three study groups showed no side effects to either drug or to block technique. 3.4% of patients in Group A had nausea. 3.2% patients in Group C had vomiting. Bradycardia was noted in 3.4% in Group A, 5.9% in Group B and 3.2% in Group C. 2.9% patients had hypotension in Group B while as 3.2% patients had hypotension in Group C. The results were statistically insignificant (P value >0.05). Similar results were observed by Abdulatif M. et al in 2016[55].While comparing 25 mcg, 50 mcg or 75 mcg of dexmedetomidine, as an adjuvant to ropivacaine he also observed that the episodes of hypotension were significantly more common in the 75 mcg Group compared with the other three groups (p = 0.002). Sahi P et al in 2018[63] also reported statistically insignificant adverse effects like nausea, vomiting, sedation, bradycardia and hypotension in the post- operative period in their study. Our study also correlates with that of Sun Q[64] who reported that addition of dexmedetomidine did not affect the incidence of postoperative nausea, vomiting, hypotension, bradycardia, somnolence and pruritis.

CONCLUSION

The addition of fentanyl and dexmedetomidine to ropivacaine for adductor canal block increases postoperative analgesia time and reduces total amount of analgesic consumed postoperatively. This study also showed that addition of 1mcg/kg fentanyl to ropivacaine showed significantly better duration of postoperative analgesia in comparison to 0.25mcg/kg dexmedetomidine, without causing any significant side effects.

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