Post-operative Epidural Analgesia after TKR: A Double Blind Randomized Comparison of Ropivacaine 0.2% and Levobupivacaine 0.125%

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ABSTRACT

Introduction: With the increase in the life span of human beings and added to that the culture of processed food there are increase in life style disorders in humans. The commonest orthopedic problem which we see due sedentary life style, lack of healthy wholesome diet are bone related disorders mainly osteoarthritis.

Ropivacaine, an alternative to bupivacaine is structurally closely related to bupivacaine and supplied as the pure S-enantiomer. We therefore decided to compare the efficacy of continuous infusion of levo bupivacaine against ropivacaine to identify the differences or superiority of one drug over other.

Material and methods: After obtaining the Ethics Committee approval, we recruited 110 patients undergoing Total Knee Replacement (TKR) surgery under Combined Spinal Epidural (CSE) Anaesthesia. Sample size of study which was calculated as 110. All patients underwent a routine pre anaesthetic check-up including the spine examination. Pre-anaesthetic check- up was done a day prior to surgery. All routine investigations were advised. The details of our study were explained to the patients, in the language understood by them. Consent was obtained for post-operative use of Elastomeric infusion pump. They were explained about the use of VAS.

Results: Both groups were comparable with respect to demographic profile. The patients in ropivacaine group showed significantly lower pulse rate as compared to levobupivacaine group. Patients in ropivacaine group recorded significantly lower systolic blood pressure throughout the infusion period as compared to those in the levobupivacaine group. The difference in diastolic blood pressure was not significant. The time taken for the sensory block to regress to L1 was longer in ropivacaine group as compared to levobupivacaine group.

Conclusion: Patients in both the group had comparable VAS post operatively. Although Patients in the ropivacaine group had better VAS score as compared to levobupivacaine, the difference was not statistically significant. There were no side effects like motor weakness, hypotension, bradycardia or PNOV in any group. Our present study thus concludes that as far as analgesic properties are concerned Ropivacaine with its more suitable toxicity profile and less motor block is more favourable for continuous infusion for patients undergoing TKR when used in equipotent doses.

Keywords: Post-operative Epidural Analgesia, TKR, Ropivacaine, Levobupivacaine

INTRODUCTION

Total Knee Replacement (TKR) is now a common procedure performed to improve mobility and quality of life in patients suffering from various chronic diseases like rheumatoid arthritis, age related changes in the joint and occasionally in cases of trauma to bones involving knee joint. TKR is highly painful procedure requiring profound intraoperative analgesia and motor block and also requires good post-operative analgesia. After surgery, early mobilization and physiotherapy prevents many complications in such patients like deep vein thrombosis, embolization of fat or micro embolization of bone fragments due to rimming. This early ambulation requires profound analgesia without motor block. Several studies have reported a reduction in postoperative complications and improved outcomes when this pain is managed with regional anaesthesia.

Common techniques of post-operative pain relief after TKR include Oral, intravenous and epidural analgesia with or without opioids as additives, intra-articular drug instillation; femoral, sciatic, Adductor canal nerve block etc. No single technique is superior to other in providing analgesia but a patient centric multimodal analgesia provides best result in any patient. We have studied the use of continuous infusion of local anaesthetic drugs through elastomeric epidural pumps for post-operative analgesia which contained local anaesthetic agents either Levo-bupivacaine or Ropivacaine. Levo-bupivacaine is the pure S-enantiomer is associated with less toxicity.[1]

Ropivacaine, an alternative to bupivacaine and Levo-bupivacaine is structurally closely related to bupivacaine and supplied as the pure S-enantiomer. It possesses a more favourable toxicity profile than bupivacaine with a higher threshold for cardiac and central nervous system toxicity.[2] Additionally, Ropivacaine tends to produce less motor blockade which facilitates early movement and physiotherapy. In parturient epidural studies designed to compare the minimal effective local anaesthetic

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concentration, Ropivacaine was found to be 40% less potent than racemic bupivacaine. The efficacy of Ropivacaine is similar to that of bupivacaine and Levo-bupivacaine for peripheral nerve blocks and, although it may be slightly less potent than bupivacaine when administered epiduraly or intrathecally, equipotent doses have been established.[3] The analgesic potency of Ropivacaine was 0.60 (0.47–0.75) relative to bupivacaine.[4]

We therefore chose to compare the efficacy and safety profile of Levo-bupivacaine [0.125%] with that of Ropivacaine [0.2%], when used for post-operative pain relief via the epidural route taking into account the 60% potency to adjust equipotent dosage. As both the drugs are available as preservative compounds it gave us an added benefit.

Study aimed to compare the analgesic efficacy of Levo-bupivacaine (0.125%) with that of Ropivacaine (0.2%), when used as epidural infusion postoperatively in patients of Total Knee Replacement.

Primary Objective was to compare the analgesic efficacy of Levo-bupivacaine 0.125% with Ropivacaine 0.2% using Visual Analogue Scale (VAS).

Secondary Objectives were to study the difference in hemodynamic parameters between Levo-bupivacaine (0.125%) and Ropivacaine (0.2%), when used as continuous epidural infusion and to study incidence of side effects like Residual motor Block, Post-Operative Nausea and Vomiting (PONV), Dizziness, Pruritus.

MATERIAL AND METHODS

After obtaining the Ethics Committee approval, we recruited 110 patients undergoing Total Knee Replacement (TKR) surgery under Combined Spinal Epidural (CSE) Anaesthesia. All patients underwent a routine pre anaesthetic check-up including the spine examination. Final Pre-anaesthetic check-up was done on the day of surgery. All routine investigations i.e. complete blood count, Liver function test, renal function test, Chest X-ray and Electrocardiogram were reviewed. The details of our study were explained to the patients, in the language understood by them. Consent was obtained for post-operative use of Elastomeric infusion pump. Patients had to purchase the elastomeric as same were not on hospital drugs and equipments list. So the patients who consented for it and were able to afford it were enrolled in our study. They were explained about the use of VAS.

Inclusion criteria

1. Age: 40-70 years.
2. Males and Females
3. ASA Physical Status I/II
4. Weight: 50-90 kg
5. Height: 150-190 cm

Exclusion criteria

1. Patient refusal to participate in the study or who were unable to afford the elastomeric pump (as they were not on the hospital drugs and equipment schedule).
2. Known allergy to local anaesthetics or opioids or any components of the drugs.
3. ASA III/IV
4. Any Contraindication to Epidural Anaesthesia/Sub arachonoid block.
5. Communication difficulty that would prevent post-operative assessment (Language barrier between the assessing doctor and patient or his relative).

Sample size

We used the study conducted by Lorenzini, C., Moreira, L. B. and Ferreira, M. B. (2002), Efficacy of Ropivacaine compared with Ropivacaine plus Sufentanil for postoperative analgesia after major knee surgery. Anaesthesia, 57: 424-428 (5), our sample size was calculated as 110 to get relevant data for clinical and statistical analysis.

Study design

It is a randomized prospective double blind study. The patients who gave ascent to purchase of elastomeric pump after proper consultation and were convinced of its benefit were enrolled in the study. Patients were divided into two groups by computer generated randomization. The treating orthopaedic surgeons were also informed about the study so as to ensure that there was no duplication of post-operative analgesic advice. They were also asked to inform about any difficulty they faced in post-operative ambulation of the patients like weakness in limbs to perform physiotherapy or ambulation.

As routine protocol in orthopaedic department of our institute, Total Knee Replacement surgery are performed under combined spinal epidural [CSE] anaesthesia unless contraindicated. After confirming nil per oral status and written informed consent for surgery and participation in the study the patients were taken inside the operation theatre. Monitors were attached to the patients i.e. electrocardiogram, non-invasive blood pressure monitoring and pulse oximetry. Patients' baseline pre-operative parameters were recorded. Intravenous access established with 18 gauge intravenous cannula and crystalloid infusion was started. Procedure was performed with patient in sitting position. Under all aseptic precaution painting and draping performed. Combined spinal epidural procedure was performed by using the midline approach in sitting position. The epidural space was located at L2-L3 or L3-L4 interspace. A local anaesthetic was injected. Epidural space was located with16 G Epidural needle using loss of resistance technique. Spinal Anaesthesia had given with 12-15mg of bupivacaine [0.5% heavy] by needle through needle technique after free flow of CSF was noted. Spinal needle was removed and the epidural catheter inserted ≅ 5cm into epidural space and fixed after confirming negative aspiration for blood and CSF. Once the sensory level of T12 was achieved urinary catheterisation was done to measure the urine output and for subsequent post-operative period.

Surgery was performed with the patient in supine position after motor and sensory blockade was achieved till T10 dermatome level. At two segment regression of sensory blockade, an epidural bolus injection of bupivacaine [0.3-0.375%] was administered to maintain intraoperative

sensory level of T10-T12.All patients were catheterized for the duration of the study as per the surgeon's request.

The patients recruited for the study were postoperatively divided randomly into two groups using sealed envelopes and a computer generated randomization list.

1. Group I–Levo-bupivacaine 0.125% (Group I)
2. Group II –Ropivacaine 0.2% (Group II)

Near the end of the surgery the Elastomeric pump was filled with either of the above drugs solution prepared by an anaesthetist not involved in the study. The pump was filled to a capacity of 300ml, connected to the epidural catheter and strapped to the patient's Chest pocket. Initial infusion was started at rate of 7ml/hour. It was programmed to deliver at a rate of 5ml, 7ml or 12ml per hr. The patient was routinely monitored for 3 hours in the Post Anaesthesia Recovery Room and then shifted to the orthopaedic ward. All patients received Paracetamol 1 gm IV at the time when epidural infusion was started in the recovery room. Rescue analgesia was given by injection ketorolac 30mg i.m. if required. Post anaesthesia notes mentioned the name of anaesthesiologist who was to monitor the patient and was called if there was any clinical complication which needed opinion of the anaesthesiologists. Orders regarding emergency management were also mentioned in the notes.

An anaesthetist blinded to treatment group and the content of pump monitored the patient at 6hours, 12 hours. 24 hours, 36 hours. & 48 hours and recorded the following parameters:

1) Hemodynamic parameters: Pulse rate and NIBP. Hypotension- Fall in BP >20% of baseline was treated with crystalloid infusion & if it does not respond, bolus of IV Ephedrine 3mg was given, or rate of infusion was decreased or temporarily stopped after consulting the anaesthesiologist. Bradycardia causing hemodynamic instability was treated with Atropine 0.6mg IV.

2) Sensory block: As per the OT protocol infusion was started at 7.0 ml, 90 minutes after the last epidural local anaesthetic injection or when the sensory level recede to T10-T12. If VAS score was >3 at rest and >5 on movement, the rate of infusion was stepped up. Patients were shifted to the wards after observing them in PACU for 3 hours post operatively. When patient complained of pain of VAS>3 or there were limbs signs of developing motor blockade the anaesthesiologist monitoring the patient was consulted and the rate of infusion was increased, decreased or temporarily withheld.

3) Visual analog sacle: The pain VAS is a one-dimensional measure of pain intensity, which has been widely used in diverse adult populations. We used s simple VAS scale of facial pattern keeping in mind the demographic profile of our patients and their understanding (lower literacy rate) which could make the use of numbered scale confusing for them. A higher score indicates greater pain intensity. Based on the distribution of pain VAS scores in postsurgical patients (knee replacement, hysterectomy, or laparoscopic myomectomy) who described their postoperative pain intensity as none, mild, moderate, or severe, the following cut points on the pain VAS have been recommended: no pain (0–1), mild pain (2-4), moderate pain (5-7), and severe pain (8-10). Fig No. 1. If the VAS was more than 3 at rest than the infusion rate was increased. If still patient had insufficient pain relief than inj. Ketoprofane 30 mg was given intramuscularly to the patient. The scale used is depicted in figure no.1.

4) Modified Bromate Scale: If the patient showed any sigh of motor weakness during the visit of the anaesthesiologist with Bromage score of 4, the rate of infusion was decreased to 5ml per hour and re-examined after 2 hours. If the weakness still persisted then the infusion was stopped.

Bromage Score	Criteria
1	Complete Block
2	Almost Complete Block
3	Partial Block
4	Detectable weakness In Hip Flexion While Supine
5	No Detectable Weakness In Hip Flexion While Supine
6	Able To Perform Partial Knee Bend

Elastomeric Infusion Pump

These are non-electronic medication pumps designed to provide ambulatory infusion therapy. We have used Large Volume Devices of these elastomeric pumps with volume of 300ml and variable flow rate of 5, 7 & 12 ml per hour. With the initial flow rate of 7 ml/hr. the approximate infusion time was around 43 hours. This resulted in the post-operative monitoring of up to 48 hours.

Peri-operative Complications

The patients and the surgeons were asked to report about any side effects or complications that occurred during the study period. Surgeons were asked about the incidence of residual motor block which prevented the early mobilisation or active physiotherapy for rehabilitation and other complications during their post-operative visits. Nursing charts were examined to check for any incidences of any other complications live post-operative Nausea, vomiting and other complications. Same were confirmed with the patients and their care takers during the visits

RESULTS

Demographic data

Table no.1 shows the age, sex and ASA status distribution of the patients in both Group I & II. There were total of 110 patients divided into two groups of 55 patients each. Both the groups were statistically

comparable to each other. There were 42 males in Group I and in Group II there were 40 males. The number of females in Group I were 13 and in Group II there were 15. Out of 82 males recruited 51.20% were in Group I and 48.80% were in Group II. For 28 females the percentage in Group I and Group II was 46.40% & 53.60% respectively.

The mean age of patients in Group I and Group II was 59.45 years and 59.27 years respectively.

The ASA status of patients was also comparable in both the groups. The number of ASA I patients in Group I and Group

Parameter		Group I	Group II	Total
Sex	Male	42	40	82
	Female	13	15	28
Total		55	55	110
Age	Number of patients	Age in years	STD. Deviation	
	55	59.45	7.54	55
	55	59.27	7.78	55
Total				110
ASA	ASA	Group I	Group II	Total
	I	8	15	23
	II	47	40	87
Total				110

Table-1: Demographic data

Parameters GRP I/II	Time	Mean pulse rate (SD)	Mean Systolic Blood Pressure (SD)	Mean Diastolic Blood Pressure (SD)	Mean Bromage Scale score (SD)	Mean VAS at Rest (SD)	Mean VAS Movement (SD)
Group I	Baseline	78.45(3.71)	116.11(7.03)	76.74(4.14)	0	0	0
Group II	Baseline	77.60(3.48)	113.76(5.69)	75.05(4.37)	0	0	0
Group I	6	109.67(7.22)	131.40(7.58)	86.22(4.38)	2.53(0.57)	5.85(0.84)	6.71(0.71)
Group II	6	100.40(8.19)	126.78(9.03)	84.36(4.47)	2.73(0.48)	5.76(0.98)	6.56(0.81)
Group I	12	99.76(8.64)	125.51(6.10)	81.09(4.76)	3.51(0.69)	4.73(0.82)	5.57(0.66)
Group II	12	92.64(8.96)	122.53(8.04)	81.42(5.45)	3.62(0.59)	4.64(0.86)	5.44(0.78)
Group I	24	91.69(8.33)	118.38(6.90)	81.00(5.32)	4.40(0.65)	3.67(0.84)	4.36(0.70)
Group II	24	86.89(7.05)	114.58(6.55)	79.73(5.98)	4.44(0.63)	3.51(0.90)	4.40(0.83)
Group I	36	88.73(7.45)	114.53(6.71)	79.09(7.05)	5.22(0.53)	2.71(0.71)	3.42(0.62)
Group II	36	83.47(5.82)	111.91(6.68)	78.33(7.02)	5.36(0.62)	2.64(0.77)	3.40(0.87)
Group I	48	85.24(5.46)	115.47(7.05)	79.18(5.97)	5.84(0.37)	2.15(0.40)	2.71(0.53)
Group II	48	81.995(5.06)	110.60(7.06)	76.62(7.51)	5.85(0.35)	2.02(0.65)	2.58(0.62)

Table No 2: Monitored Heamodynamic and Block characteristic in both the groups.

Parameters GRP I/II	Time	Mean pulse P Value.	Mean Systolic Blood Pressure P Value	Mean Diastolic Blood Pressure P Value	Mean Bromage Scale score P value	Mean VAS at Rest P value	Mean Vas On Movement P value
Group I	Baseline						
Group II	Baseline	0.21	0.05	0.08	NA	NA	NA
Group I	6	0.0001	0.004	0.03	0.05	0.60	0.32
Group II	6						
Group I	12	0.0001	0.30	0.73	0.37	0.57	0.79
Group II	12						
Group I	24	0.0001	0.004	0.24	0.76	0.32	0.80
Group II	24						
Group I	36	0.0001	0.04	0.57	0.19	0.61	0.90
Group II	36						
Group I	48	0.001	0.0001	0.05	0.79	0.22	0.25
Group II	48						

Table-3: Comparision of P valuses of haemodynamic and pain parameters (Unpaired 'T' Test)

II were 8 and 15 respectively. ASA Status II patients were 47 and 40 in Group I and Group II respectively. Thus both the groups were comparable in all respect.

Table no 2 gives the details of all the haemodynamic parameters and the characteristics of block after the infusion was started in the patients. The group I patients received 0.125% Levo-bupivacaine and group II patients received 0.2% Ropivacaine over the period of up to 48 hours post-operatively. Anaesthesiologist blinded to study visited the patient in wards at specific intervals to collect the data and adjust the rate of infusion as required during the study period. Table no. 2 also compared the mean Bromage scale of motor

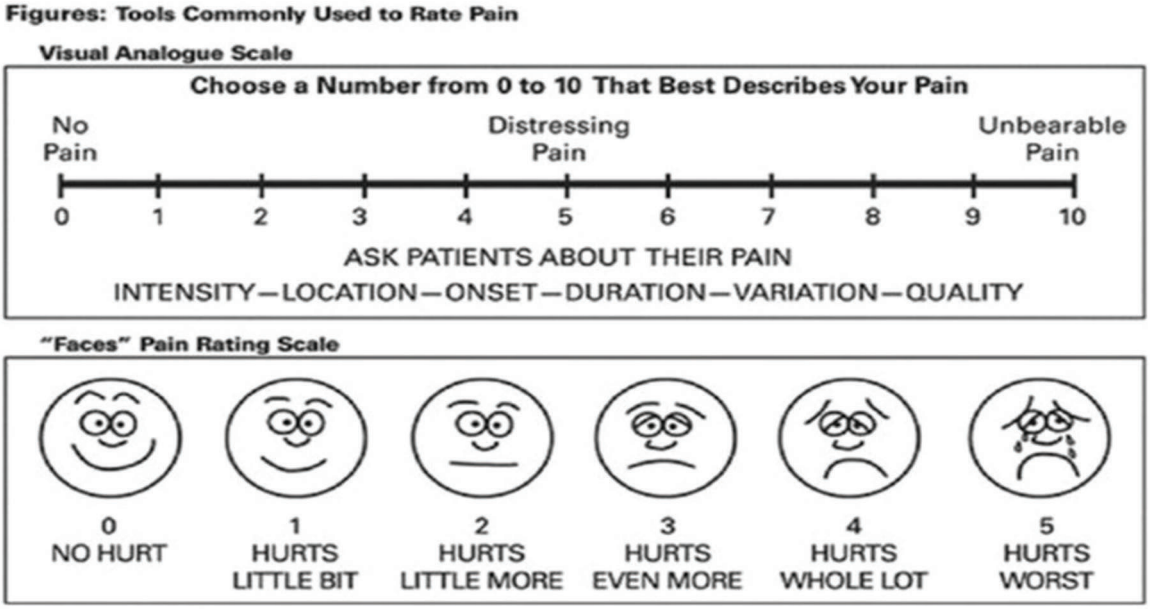

Figure-1: Visual Analog Scale used in the Study

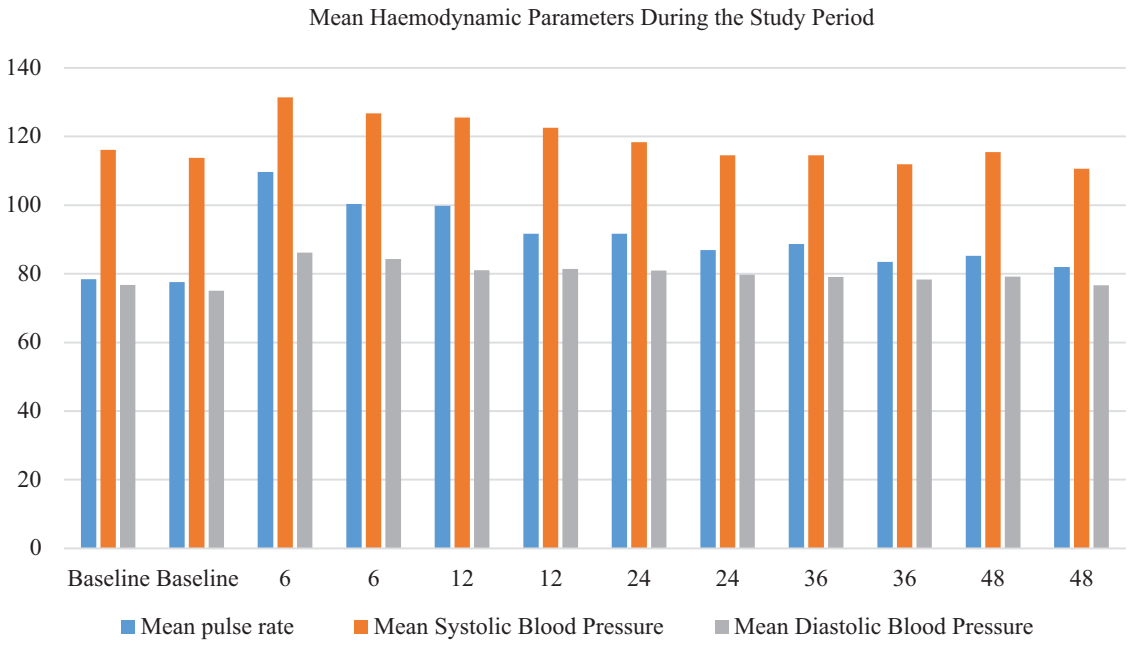

Figure-2 Comparison of Mean Haemodynamic parameters

block during the post-operative phase and VAS score at rest and movement at specific intervals during the period of observation. From the table we can observe that both groups were comparable in all the parameters. There was decrease in mean heart rate and blood pressure in both groups more so in group II this was it clinically not significant as to warrant any treatment.

The main aim of our study was to compare the analgesic efficacy of 0.125% Levo-bupivacaine compared to 0.2% Ropivacaine when given as epidural infusion by elastomeric pump for patients operated for Total Knee Replacement.

As far as haemodynamic parameter are concerned the mean pulse rate was significantly lower in patients receiving Ropivacaine infusion. Though it was statistically very significant ($P<0.05$) throughout the study period that is from start of infusion till 48 hours of observation it was not clinically relevant to warrant any treatment. The decreased heart rate also did not cause any physiological or pathological problem for the patients.

The mean systolic blood pressure was also significantly low in the Ropivacaine group when compared to Levo-bupivacaine group. The statistical difference was very prominent at 6, 24 and 48 hours. Here again though the difference was statistically very significant but it was not clinically mandated any treatment and it was within the acceptable limits of safety and no pharmalogical treatment was required at any time during the study.

The mean diastolic blood pressure was comparable between both the groups throughout the study period except for a single reading at 6 hours after starting infusion.

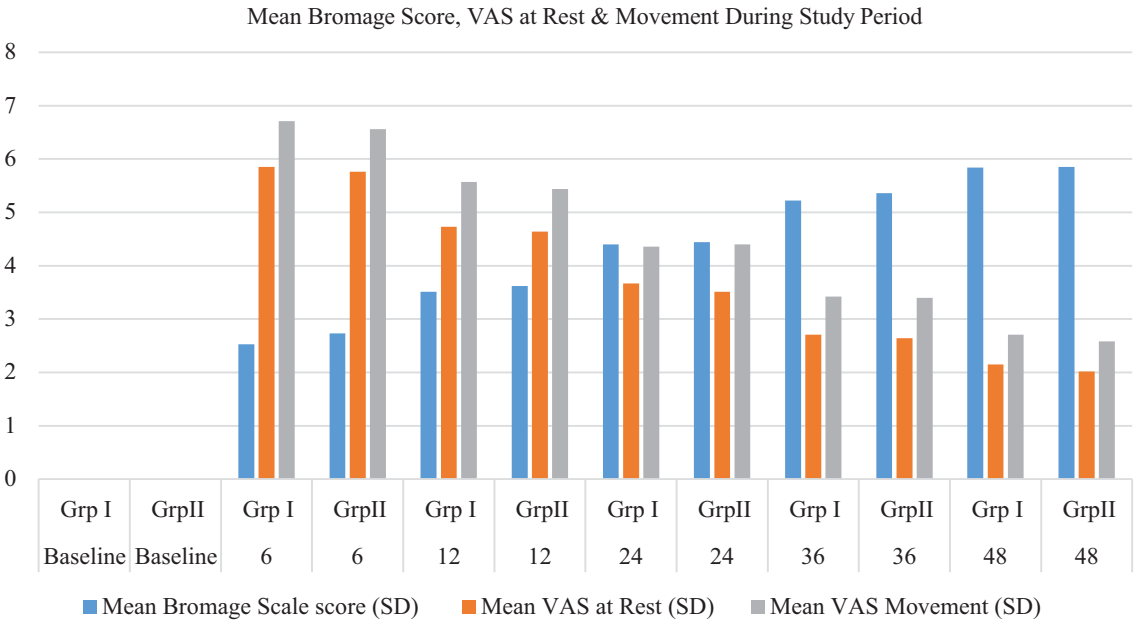

Figure-3: Comparison of Block Characteristic and Pain Score at Rest and Movement during study period

The modified bromage scale was also comparable in both the groups and there was no statistical difference between both the groups. Patients in both the groups started to gain power in their limbs at the end of first 12 hours but the without the associated pain usually seen in patients with this kind of surgeries. The mean VAS score was less than 4 at rest from that time till the end of study. According to the VAS scale used in this study pain score of up to 4 came in mild pain category.

The mean visual analog score at rest throughout the duration of the drugs was lesser for ropivacaine than levo-bupivacaine. The difference in each instance though was not statistically significant as P value was >0.05 by unpaired 'T'Test. The VAS was also lower than Levo-Bupivacaine when compared to Ropivacaine. This was also not statically significant as P value was less then0.05 by unpaired T test and as such was not found to be the point to increase the rate of infusion or to give rescue analgesia.

No complications were noted in any patients by the anaesthesiologist during their post-operative visits nor the surgeons complained about any residual motor block which interfered in early ambulation of the patients. Nearly all the patients were satisfied with the quality of analgesia that was provided by the continuous infusion of local anaesthetic agent. There was no incidence of PNOV in any patients. The infusion also helped in the early starting of mild active physiotherapy in the patients (figure 2,3).

DISCUSSION

This was a prospective randomised double blinded study with a study population of 110 patients divided into 2 groups of 55 patients each. Randomisation was achieved through the computer generated programme and the anaesthesiologist preparing the infusion and the anaesthesiologist recording the parameters were both blinded to the drug given in infusion. As mentioned earlier we used equipotent doses of both the drugs with the concentration of 0.125% for Levo-Bupivacaine and 2% for Ropivacaine.[4] The number of participants per group in our study was derived from the study done by Capogna et.al.[5]

In our study there was significant difference in the haemodynamic parameters in both the groups during the study which was in similar to the study done by Manazir et.al.[6], who reported significant fall in MAP in both the groups when compared to baseline value. They also reported that the hypotension caused by Ropivacaine was transient (30min) than in Levo-Bupivacaine group where the hypotension persisted for longer time (100min). But unlike in their study even though there was statistically significant difference in haemodynamic in our study it was not clinically significant to warrant any treatment.

Study by Kallio and colleagues[7] had the findings similar to our study. They also reported marginal fall in blood pressure when Ropivacaine was used intrathecally but this was not statistically significant nor did it require any treatment by vasopressor agents. This finding was similar to our study in which the Ropivacaine group had statistically significant changes in haemodynamic parameters but who did not require treatment for any changes in haemodynamic parameters even though fall in Heart rate and systolic blood pressure during the study period though we had given the drug epiduraly.

In study by A Casati et.al. published in Journal of Clinical Anaesthesia[8], who used epidural anaesthesia with 0.5% Levo-Bupivacaine and 0.5% bupivacaine intraoperatively they didn't find any difference in quality, onset and duration of block. They further studied epidural infusion of 0.125% Levo-Bupivacaine, 0.125% bupivacaine and 0.2% Ropivacaine for post-operative analgesia. They found that all the three drugs provided adequate analgesia and recovery profile were similar for all the three drugs. In our study we used equipotent doses of Levo-Bupivacaine (0.125%) and

Ropivacaine (0.2%) by using epidural anaesthesia post-surgery. The quality of analgesia was same for both the drugs with Levo-Bupivacaine group having enhanced motor block than Ropivacaine 0.2% but that was not clinically significant to interfere with early ambulation of patients.

Results similar to our study were also found by Zeynep Nur Orhon et.al. In 2015[9] As in our study they also found it easy for Ropivacaine group to be mobilised early due to lesser motor block compared to Levo-Bupivacaine group though the Bromage scale scores were statistically not significant.

In study by Alex T. H. Sia et al[10] found that there was no difference in the duration and quality of analgesia (VAS) in both the groups of patient receiving either Ropivacaine or Levo-Bupivacaine which is similar to the findings of our study. In our study also the VAS in both the group was statistically comparable.

Even in the study done by Furan Akhtar Ansari & Shilpi Misra[11] and E. Sitsen Et al.[12], they found that there was no statistical significant difference in the VAS of patients regardless of the drug used that is either Ropivacaine or Levo-Bupivacaine which is similar to our study. As mentioned above in our study the VSA at 6, 12, 24, 36 and 48 hours were comparable in both the groups. (As seen in table number 2). In the study by E.Sitsen et.al. in which two different concentrations of Ropivacaine was used 0.2% and 0.125% along with 1ug/ml of sufentanil they didn't find any difference in the quality of block.

In another study by conducted by N L Purdie and M E McGardy[13] they compared patient controlled epidural analgesia with Ropivacaine 0.1% and Levo-Bupivacaine 0.1% both with 0.0002% fentanyl for analgesia during labour. Their study concluded that both drugs are clinically indistinguishable for labour analgesia and appear equipotent. In comparison with our study they had used lower concentrations of both the drugs but with the use of fentanyl a narcotic both the synergistic action in epidural block may have been the factor for the clinically indistinguishable effect in labour analgesia.

In different study comparing 0.125% or 0.2% Levo-Bupivacaine for continuous sciatic nerve block in comparison with 0.2% Ropivacaine by A Casati et.al.[14], it was concluded by the authors that both the concentrations of Levo-Bupivacaine provide adequate analgesia which was similar to that provided by 0.2% Ropivacaine. They therefore recommended that 0.125% Levo-Bupivacaine should be preferred if early mobilisation of operated foot is required. In the present study by us we used the lower concentration of Levo-Bupivacaine that is 0.125% and were able to get similar analgesia in both the groups which enabled early ambulation of patients. The proved that the lower concentration of Levo-Bupivacaine 0.125% is as potent as 0.2% Ropivacaine when early ambulation is desired in patients.

A study was conducted by De Cosmo et.al comparing epidural analgesia after lung surgery.[15] In the study Ropivacaine 0.2% was compared with 0.125% Levo-Bupivacaine combined with sufentanil. They concluded that equivalent volumes of Ropivacaine 0.2% w/v and Levo-Bupivacaine 0.125% w/v provided similar static and dynamic analgesia with similar incidence of minor side effects after thoracotomy. Findings of this study compares favourably with our study in TKR, where we found insignificant differences in quality of analgesia and ambulation in equipotent doses of Levo-Bupivacaine 0.125% and Ropivacaine 0.2% without addition of any additives to enhance the potency of analgesia.

CONCLUSION

We concluded that Ropivacaine 0.2% and Levo-Bupivacaine 0.125% comparable when used as post-operative epidural analgesic infusion after Total Knee Replacement surgery. The Visual Analogue Score (VAS) and Motor blockade assessed at 6 hrs., 12 hrs., 24 hrs., 36 hrs. and 48 hrs. time interval were not significantly different. There was significant difference in sensory blockade, pulse rate and systolic blood pressure during the infusion period.

Our present study thus concludes that as far as analgesic properties are concerned Ropivacaine and Levo-Bupivacaine are comparable for use as continues infusion for epidural analgesia and there is no difference in them if used in equipotent doses. But Ropivacaine with its more suitable toxicity profile is more favourable for continuous infusion for patients undergoing TKR. We also conclude that in equipotent doses both the drugs are relatively safe and patients can be shifted to their clinical wards than to be kept in HDU for monitoring during the period of infusion. The decision to use either of the drug clearly depends upon the cost and the ease of availability of the drug in the settings that it is being used.

Limitations of our study are as follows:

1. Considering the number of replacement surgeries done at our institute the sample size is still less.
2. We also did not take into consideration Hip joint replacements which happen in our institute who also received the same mode of analgesia when demanded by them.
3. There was no use of adjuvants either intrathecally or epiduraly as we wanted to concentrate on pharmacological properties of the local anaesthetic drugs only.

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