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TO STUDY THE EFFICACY OF FEMORAL NERVE BLOCK WHEN USED AS A PART OF MULTIMODAL ANALGESIA REGIMEN IN PATIENTS UNDERGOING KNEE ARTHROPLASTY PERFORMED UNDER SUBARACHNOID BLOCK.

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ABSTRACT
Total Knee Arthroplasty (TKA) is a common orthopaedic procedure, consisting of replacing diseased or damaged knee joint surfaces to relieve the pain and disability of osteoarthritis AimTostudy and compare the efficacy of femoral nerve block and adductor canal block when used as a part of multimodal analgesia regimen in patients undergoing Total Knee Arthroplasty under subarachnoid bloc. The ASA 100 strongly recommends that regional blockade with local anaesthetics be considered as a part of the multimodal approach for pain management. Regional block such as femoral nerve block, with local anaesthetics remains a well- accepted component of comprehensive multimodal anaesthesia for postoperative pain management Aim: Tostudy and compare the efficacy of femoral nerve block and adductor canal block when used as a part of multimodal analgesia regimen in patients undergoing Total Knee Arthroplasty under subarachnoid block.Objectives: To assess the effect of femoral nerve block and adductor canal block on the Pain intensity by NRS scale at specific time intervals, till 24hours post block, the duration of sensory blockade, the duration of motor blockadeandto measure the total amount of opioids consumed, till 24 hours post block. Study population: Studypopulation was limited to the patients undergoing elective TKA under SAB under same surgeon. Sample size & sample technique: Sample size was limited to 150 patients systematically divided into two equal groups of 75 patients in each group We found that the mean NRS pain score at 6 hours, 12 hours and 24 hours in both the groups were similar with the difference being statistically insignificant. In group A mean NRS pain score at 6 hours was 2.8400 ± 1.4708 and in groupB it was 2.6933 ± 1.5594 with p value of 0.5544. Mean NRS pain score at 12 hours in group A was 4.9467 ± 1.3939 and in group B it was 4.9067 ± 1.2858 with p value of0.8553.Mean NRS pain score at 24 hours in group A was 3.0533 ± 1.4036 and in group B it was 2.9733 ± 1.3252 with the p value of 0.7202.We found that the difference in duration of sensory block was also not statistically significant in both the groups with mean duration of sensory block inhoursbeing9.2400 ±1.8733ingroup Aand 8.8133 ±1.9844in groupB with p value of -0.1778 and total amount of opioid consumption was also similar in boththegroupswithmeanopioidconsumptioninmicrograms-being132.6000± 31.9666 in group A and 134.3333 ± 30.4841 in group B with p value of 0.7345 100.

INTRODUCTION

Total Knee Arthroplasty (TKA) is a common orthopaedic procedure, consisting of replacing diseased or damaged knee joint surfaces to relieve the pain and disability of osteoarthritis. [1]).TKA is associated with significant post- operative pain that can delay recovery and lengthen hospital stay.[2]Appropriate pain management is a key factor in patient's early recovery to physical fitness, satisfaction and shorter hospital stay.TKA is one of the most painful surgical procedures. Effective analgesia in the immediate postoperative period is important to allow the patient to regain mobility, thereby facilitating recovery and decreasing the length of hospital staynrelieved severe postoperative pain can result in pathophysiological responses causing adverse postsurgical outcomes.[1]Using opioids alone 100 intensifies their familiar side-effect profile that includes respiratory depression, postoperative nausea and vomiting over sedation, pruritus and chronic opioid dependence. 100 On the other hand the administration of non-steroidal anti inflammatory medications (NSAIDS), particularly at higher doses, may be associated with gastrointestinal side effects such as gastritis, gastric ulcers, increased bleeding, and renal impairment. Local anaesthetics have been used in peripheral nerve block prior to or after surgical procedures. However, their use is sometimes limited due to their short duration of action. Excess dosage of local anaesthetics in the blood can cause local anesthetic systemic toxicity leading to cardiovascular collapse and central nervous system side effects (LAST).Multimodal approach to pain control involves administration of combination of either multiple analgesics or modalities at various time points during the course of surgery that includes perioperative period.[3,4] In 2012, the American Society of Anaesthesiologists (ASA) released an update to its Practice Guidelines for Acute Pain Management in the Perioperative Setting. [5] In this report, the ASA stronglyrecommends the use of a multimodal approach to pain management whenever possible. The ASA strongly recommends that regional blockade with local anaesthetics beconsidered as apart of the multimodal approach forpain management. Regional block such as femoral nerve block, with local anaesthetics remains a well- accepted component of comprehensive multimodal anaesthesia forpostoperative pain management. [6]

AIM AND OBJECTIVE

AIM:

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To study and compare the efficacy of femoral nerve block when used as a part of multimodal analgesia regimen in patients undergoing Total Knee Arthroplasty performed under subarachnoid block.

OBJECTIVES:
Primaryobjective:
To assess the effect of femoral nerve block
The Pain intensity by NRS scale at specific three point time intervals, till 24 hours post block.
The duration of sensory block.
The duration of motor block.
Secondaryobjective:
To measure the total amount of opioids consumed, till 24 hours post block.

MATERIALS AND METHODS

Study Population: Study population was limited to the patients undergoing elective Total Knee Arthroplasty under SAB.
StudyDesign:ProspectiveObservationalcomparativeStudyDesign. 4. SampleSize Total number of patients in the study were 75 . 75patients-singleshot femoral nerve block
All patients received preoperative oral pregabalin 75 mg bd one day before the surgery, IV acetaminophen 1 gm. before the incision intraoperative and was continued every 8 hourly till 24 hours from the time of complete administration of block in the postoperative period, and opioids(fentanyl) for breakthrough pain in the postoperative period by PCA pump.
StudyDuration: The study was conducted over a period of one year January 2019 - December 2019.
Inclusion Criteria:

1. Age30-70 years. 100
2. American Society of Anaesthesiologists(ASA)StatusI-II.
3. Normal pre-operative mobility.
4. Mentally capable of comprehending and using Numerical Rating Scale for Pain score.
5. Mentally capable of comprehending and using PCApump.

ExclusionCriteria:

1. American Society of Anesthesiologists(ASA)Status III and above.

2. Age70yr.
3. Patients not consenting to participate in the study.
4. Pre-existing sensory or motor neuropathy.
5. Immunosuppressed patient.

Methodology:
The patients were recruited from January 2019 to December 2019. 75 patients were systematically divided into two groups, strictly adhering to inclusion and exclusion criteria for this study.
Single shot femoral nerve block with 30 ml 0.5% Ropivacaineunder USG guidance All the subjects received preoperative oral pregabalin 75 mg 100 bd one day prior to surgery, IV acetaminophen 1gm stat before incision intraoperatively followed by 1gm 8 hourly till 24 hours in the postoperative period, and opioids 100 100 (fentanyl) for breakthrough pain in postoperative period by PCA pump. TKA was performed under SAB.
RESULTS
Inthisobservationalaudit,150patientswerestudiedwhounderwentTotalKneeArthrop sty under subarachnoid block. Subjects were divided into two groups of 75 patients each namely GROUP A and GROUP B .The patients in GROUP A received single shot femoral nerve block and the patients in GROUP B received single shot adductor canal block. All the 150 subjects received preoperative oral pregabalin 75 mg bd one day prior to surgery, IV acetaminophen 1gm stat before incision intra operatively followed by 1gm 8 hourly till 24 hours in the postoperative period, and opioids (fentanyl) for breakthrough pain in postoperative period by PCA pump.

Distributionofsexinthegroup.

HYPOTHYROIDISM	**GROUP**
YES	**05**
NO	**70**
TOTAL	**75**

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		Number	Mean	SD	Minimum	Maximum	Median	p-value
DURATION OFSENSORY BLOCK	GROUP A	75	9.2400	1.8733	4.0000	12.0000	10.0000	0.177

Difference between the hypothyroidism was not significant, Chi-square value: 1.3843; *p*-value: 0.2393

DIABETES MALLETUS	GROUP
YES	**30**
NO	**45**
TOTAL	**75**

Chi-square value: 0.2789; *p*-value: 0.5974

		Number	Mean	SD	Minimum	Maximum	Median	p-value
NRS PAINSCOREAT 6HOURS	GROUP A	75	2.8400	1.4708	0.0000	7.0000	3.0000	0.5544

Difference between the mean NRS PAIN SCOREat 6HOURSin two groups was not significant, *p*-value: 0.5544

		Number	Mean	SD	Minimum	Maximum	Median	p-value
NRS PAINSCOREAT 12HOURS	GROUP A	75	4.946	71.3939	2.0000	7.0000	5.0000	0.8553

DIFFERENCE BETWEEN THE MEAN NRS PAIN SCORE AT12HOURS

		Number	Mean	SD	Minimum	Maximum	Median	p-value
NRS PAINSCOREAT 24HOURS	GROUP A	75	3.0533	1.4036	0.0000	7.0000	2.0000	0.7202

DIFFERENCE BETWEEN THE MEAN NRS PAIN SCORE AT 24HOURS

		Number	Mean	SD	Minimum	Maximum	Median	p-value
DURATION-OFMOTOR-BLOCK	GROUP A	75	11.3067	2.1684	6.0000	16.0000	11.0000	<0.0001

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Difference between the mean duration ofmotor block wassignificant,*p*-value:<0.0001

		Number	Mean	SD	Minimum	Maximum	Median	p-value
TOTALAMOUNTOFOPIOIDSCONSUMED	GROUP A	75	132.6000	31.9666	40.0000	210.0000	135.0000	0.7345

Difference between themean total amount of opioids consumed, *p*-value: 0.7345

DISCUSSION

In this study, we compared femoral nerve block and adductor canalblock, as a part of multimodal analgesia regimen in patients whounderwent elective unilateral TKA under SAB, in terms of outcommeasureslikemeanNRSpainscore,durationofsensoryblock,duration of motor block and total amount of opioids consumed till 24hours from the time of complete administration of the block. In group-A, the mean age (mean± s.d.) of patients was 63.6667 ± 4.1860 years.In group-B, the mean age (mean± s.d.) of patients was 63.0800 ±3.6678 years. Distribution of mean age vs. group was not statisticallysignificant (p=0.3628. In group-A, 31(41.3%) patients were femaleand 44(58.7%) patients were male.).ngroup-A,11(14.7%)patientshadASAstatus1and64(85.3%)patientshadASA status 2.. Association of ASA status vs.groupwasnotstatisticallysignificant(p=0.6309).ngroup-A,67(89.3%)patientswerewithouthypothyroidismand8(10.7%)patients were with hypothyroidism. Associationofhypothyroidismvs.groupwasnostatisticallysignificant(p-value:0.2393).Ingroup-A,52(69.3%)patients were without hypertension and 23(30.7%) patients were withhypertension.). In group-A, 70 (93.3%) patients werenon-smokersand5(6.7%)patientsweresmokers.. In group-A, 66(88.0%) patients werewithout chronic obstructive pulmonary disease and 9(12.0%) patientswerewithchronicobstructivepulmonarydisease.Ingroup-B,66(88.0%)patientswerewithoutchronicobstructivepulmonarydiseaseand9(12.0%)patientswerewithchronicobstructivepulmonarydisease.Similarenrollmentofpatientswasdoneinthestudydonebyseibrketalajainpnd[7,8] Association respectively. We found that the meanNRS pain score at 6 hours, 12 hours and 24 hours in both the groupswere similar with the difference being statistically insignificant. Ingroup A mean NRS pain score at 6 hours was 2.8400 ± 1.4708 and here our studyis in conjunction with the study done by **Jaeger *et al* [14],**Mean NRSpain score at 12 hours in group A was 4.9467 ± 1.3939 and in group Bitwas4.9067±1.2858withpvalueof0.8553.MeanNRSpainscoreat 24 hours in group A was 3.0533 ± 1.4036 and in group B it was2.9733 ± 1.3252 with the p value of 0.7202. here the study done byKim DH etal**and** Sinatra RS ***et-al{9,16]* totally agrees with our study**Wefound that the difference in duration of sensory block was also notstatisticallysignificantinboththegroupswithmeandurationofsensoryblockinhoursbeing9.2400±1.8733ingroupAwith p value of 0.1778 and total amount of opioidconsumptionwasalsosimilarinboththegroupswithmeanopioid consumptioninmicrogramsbeing132.6000±31.9666ingroupAwith p value of 0.7345.herestudy of Wu JW,etal[11]is in our favour whereas the study done byvan der Wal Metal[12]slightly disagrees with our resultsis in our the study done byWeusedbromagescaleasanindirectmeasure ofmuscle strengthtocalculate duration of motor block. Lesser the duration of motor block earlier therecovery from motor block, siof<0.0001. We used bromage scale as an indirectmeasure ofmuscle strengthtocalculate durationofmotorblock.Lesser the duration of motor block earlier the recovery from motor block, whichfacilitates early mobilization similar process was done in the study done bSeibRK etal and Paul JE etal[7 10]and. We used bromage scale as an indirectmeasure ofmuscle strengthtocalculate durationofmotorblock.Lesser the duration of motor block earlier the recovery from motor block, whichfacilitates early mobilization bywhich facilitates early mobilization The meanpainscoreswerefoundtobemildtomoderateonNRSpainscalewithNRSpain scores being less than 6 at all the three specific time intervals till 24 hoursin both the groups which shows the effectiveness of multimodal analgesia inpostoperative period following TKA here the study done byLaurant DB etalJæger P etal Jenstrup MT etal[13,14,15]favours our results whereas thestudydonebyKimDH,etal[16]slightlydisagreeswithourresults

;.There are various limitations to our study. The sample size was limited to 150subjects because of both time and logistic constraints. The duration of our studywaslimitedtooneyearbecauseofacademicrequirements.Similarstudywith larger sample size and longer duration is desirable

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CONCLUSION

femoral nerve block when used as a part ofmultimodal analgesia regimen in patients undergoing TKA under SAB,have:No difference in the pain scores at 6 hours, 12 hours and 24hours after the administration of block.
Nodifferenceinthedurationofsensoryblock.

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