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Is Continuous Adductor Canal Block Better Than Continuous Femoral Nerve Block After Total Knee Arthroplasty? Effect on Ambulation Ability, Early Functional Recovery and Pain Control: A Randomized Controlled Trial

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ABSTRACT

Total knee arthroplasty is associated with intense, early post-operative pain. Femoral nerve block is known to provide optimal pain relief but reduces the strength of the quadriceps muscle and associated with the risk of falling. Adductor canal block is almost pure sensory blockade with minimal effect on quadriceps muscle strength. We prospectively randomized 100 patients in two groups' continuous adductor and femoral block group. Ambulation ability (Timed up go, 10-m walk, 30 s chair test), time to active SLR, quadsticks, staircase competency, ambulation distance was significantly better (*P* value < 0.001) in adductor canal group whereas pain scores, opioid consumption showed no significant difference. Adductor canal block provided better ambulation and early functional recovery but without superior analgesia than femoral nerve block post TKA. Level of evidence: Level III, therapeutic study.

Total knee arthroplasty (TKA) is associated with intense, early post-operative pain and effective analgesia post TKA is of paramount importance. Moreover, nowadays fast track patient management is gaining popularity. Nevertheless, the ideal analgesia modality should facilitate early rehabilitation, prevent knee stiffness, improve patient satisfaction, reduce the length of hospital stay [1] and promote good functional outcomes [2,3].

Peripheral nerve blockade have been reported to deliver optimal postoperative pain relief. Moreover, they are increasingly preferred in patients undergoing orthopedic procedures [4,5]. Furthermore, multiple studies endorsed the efficacy of peripheral nerve block to shorten the time of functional recovery and provide a quality of analgesia and surgical outcomes comparable to intravenous patient-controlled analgesia (PCA) or epidural analgesia without the associated side-effects [5,6]. Femoral nerve block is known to provide optimal pain relief after TKA [7–9]. However, previous studies have found that femoral nerve block (FNB) reduces the strength of the quadriceps muscle [10–12]. In addition, several studies reported that peripheral nerve blocks involving the femoral nerve may be associated with the risk of falling [13–16]. Consequently, regional anesthesia and analgesia techniques with preserved muscle function are more justifiable.

The adductor canal blockade (ACB) offers a favorable form of peripheral nerve blockade and thereby offer better patient management post TKA [17]. Usually, it blocks the largest sensory contributions from the femoral nerve to the knee, the saphenous nerve [17,18]. In addition to the saphenous nerve, the adductor canal contains the nerve to the vastus medialis, the medial femoral cutaneous nerve, the medial retinacular nerve, and the articular branches from the posterior division of obturator nerve which enters the distal part of the canal and finally in some cases anterior branch of obturator nerve may traverse the canal. Moreover, a large volume of local anesthetic injected into the canal will theoretically disperse these fibers, thereby adding the analgesic effect [17]. Furthermore, the only potentially affected motor function is that of the vastus medialis, which makes this, block an almost pure sensory blockade with minimal effect on quadriceps muscle strength. Thus, a regime that balances optimal pain control and early mobilization after TKA is needed to be defined.

Therefore, the present study aimed to investigate and compare the efficacy of continuous adductor canal block (CACB) and continuous femoral canal block (CFNB) with respect to (1) ambulation ability and postoperative pain control, (2) systemic opioid consumption, treatment-related side effects and complications, length of hospital stay and (3) to assess the success rate of block. We thus hypothesized that large volume local anesthetic administration in the CACB may be a

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useful adjunct for early functional recovery and that it provides better ambulation ability and postoperative analgesia than CFNB post TKA.

Patients and Methods

After obtaining institutional ethics committee approval, with a prospective randomized controlled trial study design, a total of 104 consecutive patients scheduled for elective unilateral primary TKAs were assessed during the period between July 2013 and January 2014 for the eligibility of this study (Fig. 1). Written informed consent was taken from all patients prior to enrollment. We included only patients posted for primary, unilateral TKA under spinal anesthesia, and American Society of Anesthesiologists (ASA) physical status classification of I–III. Exclusion criteria were patients with renal insufficiency, history of a vascular surgery involving the femoral vessels on the operative side, history of arrhythmia or seizures, history of chronic pain unrelated to the knee requiring treatment with long acting opioids, alcohol or drug abuse, allergy to local anesthetics, localized infection, sepsis, preexisting lower extremity neurological abnormality, and difficulties in comprehending visual analog scale (VAS) pain scores. Of the 104 patients assessed, 4 patients were excluded for the following reasons: three patients with ASA grade 4 and above and one patient with pacemaker installed in situ. With these exclusions, 100 patients undergoing unilateral TKA were enrolled and randomized (Fig. 1) into two groups, (1) continuous adductor canal block (CACB) group and (2) continuous femoral nerve block (CFNB) group, using a computer generated randomization table with a permutation block of six. Thus, 50 patients were assigned to the each of the two study groups. Two patients in the CACB group had failure of the block and were excluded from the study. Thus, a total of 98 (48 CACB, 50 CFNB) patients were assessed for analysis. The patients and a clinical investigator (N.P.J.) who prospectively collected all clinical information were unaware of the group identities until the final data analysis. There were no significant differences in the demographic data, preoperative status among the two groups (Table 1).

Administration of Anesthesia and Block

All patients were given spinal anesthesia with 2.5 ml 0.5% hyperbaric bupivacaine at the L3/4 interspaces (alternatively at the

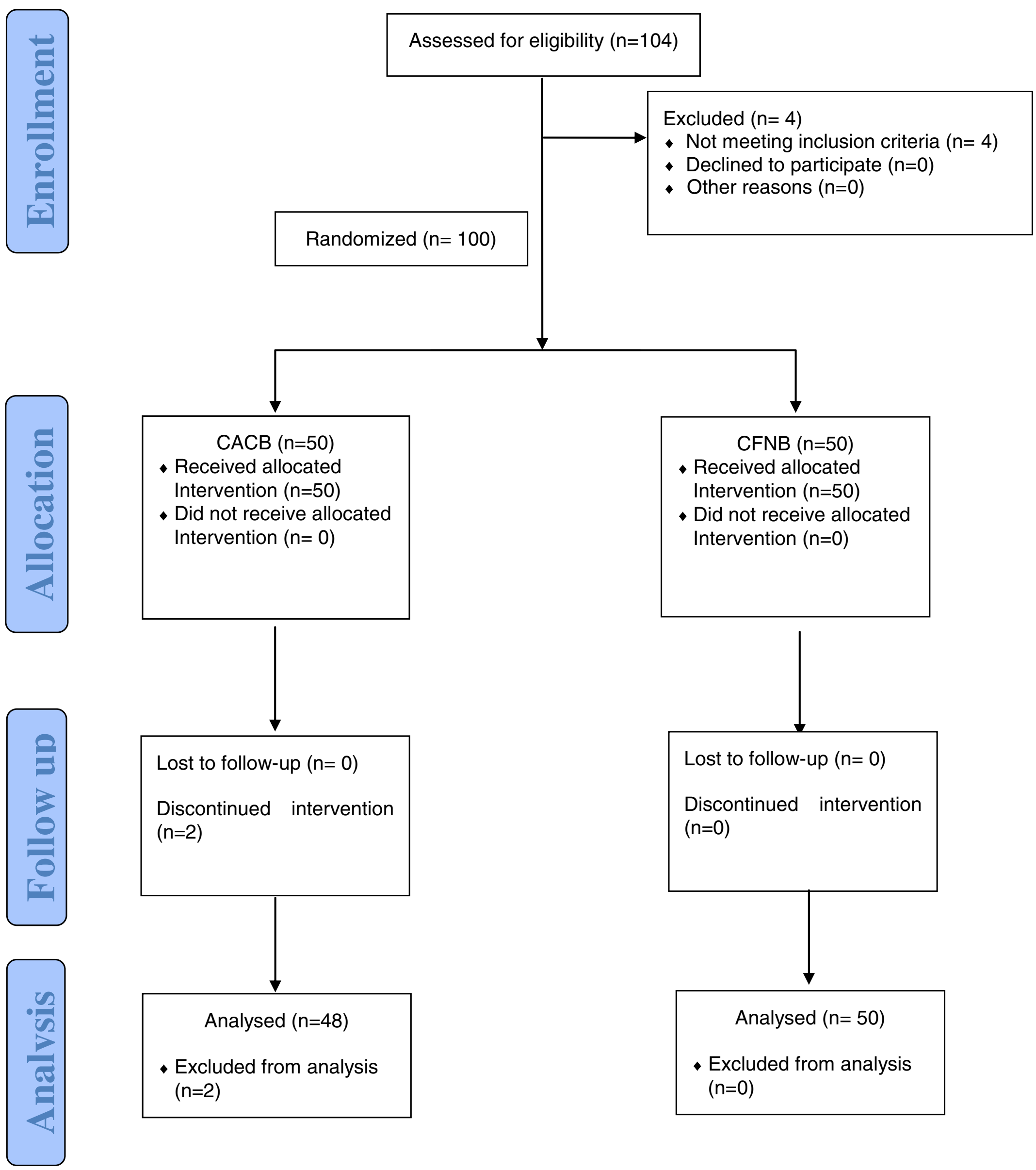

Fig. 1. Flow diagram showing patient selection and randomization.

Table 1
Demographic Characteristics of Patients in Two Study Groups.

Demographic Variables	CACB ($N = 48$)	CFNB ($N = 50$)	P Value
Gender			0.919
Male	13 (27.1)[a]	14 (28)[a]	
Female	35 (72.9)[a]	36 (72)[a]	
Age (years)	68.31 (7.56)	65.94 (7.22)	0.116
Height (cm)	155.16 (8.65)	153.71 (8.82)	0.412
Weight (kg)	70.83 (14.0)	71.82 (12.0)	0.709
BMI (kg/m^2)	29.54 (5.46)	30.52 (5.30)	0.373
ASA grade			0.287
I	13 (27.1)[a]	14 (28)[a]	
II	35 (72.9)[a]	33 (66)[a]	
III	0 (0.0)[a]	3 (6)[a]	
Patient category			0.397
A	19 (39.6)[a]	15 (30)[a]	
B	29 (60.4)[a]	35 (70)[a]	
Preoperative VAS score	68.64 (5.23)	67.90 (5.54)	0.495
Operative time (min)	68.85 (4.57)	68.30 (4.42)	0.544
Catheter placement time (min)	4.93 (0.72)	3.76 (0.55)	<0.001

CACB continuous adductor canal block group, CFNB continuous femoral nerve block group, ASA American Society of Anesthesiologists physical status, VAS visual analogue scale.
Data are presented as mean with standard deviation in the parenthesis.
[a] Data are presented as number of patients with percentage in the parenthesis.

L2/3 or L4/5 interspaces). Intraoperatively sedation with propofol and fluid therapy were administered at the discretion of the anesthetist. Each patient received the block immediate postoperatively.

Adductor Canal Block

After sterile preparation and draping, approximately halfway between the anterior superior iliac spine and the patella, at the midthigh level, adductor canal was visualized using a high-frequency linear ultrasound (US) transducer (S—nerve ultrasound, Sonosite Inc., Bothell, WA, USA). The transducer was placed transverse to the longitudinal axis of the extremity to identify the adductor canal underneath the sartorius muscle [17,19]. The femoral artery was first identified as visible pulsations, with the vein just inferior and the saphenous nerve just lateral to the artery. From the lateral side of the transducer a 10-cm, 18-gauge Tuohy needle (Braun Medical, Melsungen, Germany) was inserted in plane, through the sartorius muscle. With the tip of the Tuohy needle placed just lateral to the artery and the saphenous nerve, 20 ml of 0.75% ropivacaine was injected to expand the adductor canal. A 21-gauge catheter was then inserted 5–8 cm through the cannula. To obtain the correct position of the catheter tip, the catheter was slowly retracted during injection of a further 10 ml of ropivacaine under US guidance, until an expansion between the fascia and the vessels could be visualized.

Femoral Canal Block

After sterile preparation and draping, the initial stimulating needle placement was located 1–1.5 cm lateral to the femoral artery pulsation just below the inguinal crease [20,21]. The femoral nerve was localized by eliciting quadriceps contractions (as evidenced by either visible or palpable cephalad movement of the patellar area of the knee at 0.5 mA current output) with the peripheral nerve stimulator (Stimuplex® HNS12 with SENSe, B.Braun Melsungen AG, Germany) settings at 2 Hz and pulse width of 0.1 s. The femoral catheters were tunneled 8 cm subcutaneously just below and parallel to the inguinal crease, after which a clear sterile dressing was placed over the catheter insertion site and femoral catheter. Ultrasound guidance was used as needed in obese patients to verify femoral nerve anatomy.

In both the groups, the patients were given a loading dose of 30 cc inj. ropivacaine 0.75% followed by repeated boluses of inj. ropivacaine 0.25%, 30 cc at an interval of 4 h till 8:00 am on the morning of the second day after surgery (POD2). Block success was verified by testing for pinprick sensation in the saphenous nerve distribution.

Surgical Procedures and Perioperative Management

All surgeries were performed by senior author (N.A.S.) using minisubvastus approach, without tourniquet and no postoperative drain used. Cruciate retaining implants were used in all cases and patella was resurfaced in selected group of patients. All prostheses were implanted using hand-mixed cementing techniques. All patients were given intraarticular cocktail infiltration (20 cc 0.25% sensorcaine + 250 mg inj. cefuroxime + 40 mg Inj. triamcenolone acetate—not in diabetic and RA patients). All patients were given TED stockings for both lower limbs. Tablet aspirin 75 mg OD for 6 weeks was given to every patient as a prophylaxis to prevent deep vein thrombosis.

Perioperative intravenous antibiotics were given to all patients. Intravenous patient controlled analgesia was provided with inj. diclofenac sodium 75 mg in 100 cc NS 8 hourly, if pre-operative serum creatinine level was normal, otherwise inj. paracetamol 1000 mg infusion was given 8 hourly. In both groups of patients, inj. tramadol 50 mg was given for breakthrough pain (termed “rescue analgesia”). Additional analgesics consisted of oral acetaminophen 500 mg administered at 6 hourly intervals starting 6 h postoperatively. Ondansetron 4 mg intravenous was administered in case of moderate to severe nausea or vomiting, if needed. The catheter was removed at 8:00 am on POD 1 and site was inspected daily for signs of localized infection.

Outcomes Measures

At the time of enrollment, patients were explained and taught about the visual analog pain scale and mobilization ability assessment. Patients were assessed for pain at 4, 8, 12 and 24 h postoperatively, pain at rest and pain after mobilization on POD1 and POD2, opioid consumption, side effects if any. Ambulation abilities were assessed in the form of timed up & go (TUG) test, 10 meter walk test and 30 s chair stand test [11]. Furthermore, time to active SLR, quadstick ambulation, staircase competency and ambulation distances at discharge were evaluated.

Pain was evaluated on a VAS scale with 0 = no pain, and 100 = worst imaginable pain. The TUG test measures the time it takes a person to stand up from a chair, walk a distance of 3 m, and return to the chair. The 10-m walk test measures the time, the patient takes to walk a distance of 10 m as quickly as possible. The 30-s chair stand test assesses how many times a person is able to rise from a chair and sit down again in 30 s, with the arms kept crossed over the chest. The mobilization tests have been validated in previous studies [22–24]. No gait aids were allowed during the tests. The tests were performed 24 hour post block, only if the subject felt that it was possible to execute the test without the risk of falling.

Statistical Analyses

Statistical analyses were performed using SPSS® for Windows® (version 20.0, IBM, Chicago, IL, USA). The nature of the hypothesis testing was 2-tailed and a P value of less than 0.05 was considered statistically significant, for all comparisons. The Kolmogorov–Smirnov test was used to determine whether measured and calculated parameters were normally distributed. The Student's t test (or the Mann–Whitney U test if a normal distribution could not be reasonably assumed) was used to determine the significances of group differences in continuous variables. The chi-square or Fisher's exact test was used to analyze categorical variables. In addition, the correlation analyses were carried out to investigate the confounding effects of patient factors such as age, weight, height, and BMI. No significant group differences were found for demographic data (Table 1).

To determine whether our sample size had sufficient statistical power, we performed a priori power analysis using the two-sided hypothesis test at an alpha level of 0.05 and a power of 80%. Sixty-eight (34 in each group) were required to detect a 50% difference in ambulation ability test namely TUG test, 10-m walk test, 30 s chair test, which we considered clinically significant. Accordingly, the study sample size of 98 knees (48 in CACB and 50 in CFNB group) had sufficient power to detect the differences described earlier and to allow for exclusions.

Results

The ambulation ability (Table 2) assessed by TUG test, 10-m walk test and 30 s chair test showed significantly better results in CACB group as compared to CFNB (51.81 vs. 180.06, 67.0 vs. 273.70, 5.25 vs. 1.52, P value < 0.001, respectively). Also, all patients in CACB group performed the ambulation test whereas 6 patients in CFNB group were not willing for the tests.

Moreover time to active SLR, quadstick ambulation, staircase competency was significantly earlier and ambulation distance at discharge was higher in CACB group than in CFNB group (4.04 vs. 20.24, 5.50 vs. 22.48, 24.0 vs. 43.04, 89.27 vs. 37.36, P value < 0.001, respectively). However, maximum knee flexion at discharge showed similar results with no statistical significance (107.29 vs. 104.2, P value = 0.100). No patient had extension lag at the time of discharge. Furthermore, patients in the CACB group had shown a decreasing trend in length of hospital stay compared to CFNB group with significant difference (3.08 vs. 3.92, P value < 0.001).

Postoperative pain scores assessed in the form of VAS scale (Table 3) was lower in the CACB group than in the CFNB group at 4, 8, 12 and 24 h postoperatively but without any significant intergroup difference. Similarly pain sores on POD 1 and POD2, at rest and after mobilization were better in the CACB group without any statistical significance.

Five patients from CFNB and 2 patients from CACB group required rescue analgesia in the form of inj. tramadol (50 mg) that was not statistically significant (P value = 0.436). Out of 5 patients who required rescue analgesia in the CFNB group, 3 patients required only a single injection of 50 mg tramadol two at 8 h post-operatively and one at 12 h postoperatively, 1 patient required 2 injections at 8 h and 16 h post-operatively and 1 patient required 3 injections at 8 h, 16 h and 24 h post-operatively. On the contrary, both patients in the CACB group required single injection of 50 mg tramadol each at 8 h postoperatively. Moreover, one patient each in both groups had nausea and single episode of vomiting. Also, no patient had nerve palsy or catheter site problems.

Table 3
Comparison of Postoperative VAS Score in the CACB and CFNB Groups.

VAS Score	CACB (N = 48)	CFNB (N = 50)	P Value
DOO			
4 h	29.58 (4.70)	31.90 (8.79)	0.106
8 h	24.89 (4.55)	26.70 (4.69)	0.057
12 h	23.95 (3.56)	25.40 (3.75)	0.055
24 h	24.37 (4.07)	25.70 (3.78)	0.098
POD1			
At rest	24.58 (3.54)	25.80 (3.09)	0.073
After mobilization	32.70 (3.41)	34.0 (3.35)	0.074
POD2			
At rest	21.04 (3.56)	22.30 (2.89)	0.058
After mobilization	25.41(3.39)	26.60 (3.10)	0.075

Data are presented as mean with standard deviation in the parenthesis.
VAS visual analogue scale, CACB continuous adductor canal block group, CFNB continuous femoral nerve block group, DOO day of operation, POD postoperative day.

The average time for catheter placement was significantly more in the CACB group than in the CFNB group (4.93 vs. 3.76, P value < 0.001). In addition, the present study showed a success rate of about 96% for adductor canal block and 100% for femoral nerve block.

Discussion

Pain following TKA may be a significant hurdle to successful mobilization and rehabilitation of the patients. Consequently, it may increase the eventual risk of knee stiffness, reduction in knee scores and outcomes of a successful TKA [25]. Femoral nerve block is effective in pain control post TKA. However, it results in quadriceps weakness and thus we have to compromise between the goals of adequate pain relief and muscle strength. An ideal nerve block must provide effective analgesia and at the same time accelerate the mobilization by preserving motor function. Therefore, the present study was undertaken to evaluate the efficacy of continuous adductor canal blockade in postoperative pain control and functional recovery. Moreover, we compared the result of CACB with that of CFNB.

Our findings support the hypothesis that adductor canal block showed better postoperative outcomes with respect to ambulation

Table 2
Group Statistics of Postoperative Ambulation Ability Assessment and Functional Recovery of Patients in the CACB and CFNB Groups.

Outcome Variable	Group	Mean	SDV	SEM	t	Sig. (2-Tailed)	95% CI of Difference	
							Lower	Upper
TUG test (s)	CACB	51.81	7.93	1.14	− 12.89	0.000.	− 147.98	− 108.5
	CFNB	180.0	68.44	9.67				
10-m walk test (s)	CACB	67	7.26	1.04	− 13.84	0.000.	− 236.33	− 177.06
	CFNB	273.7	103.1	14.5				
30 s chair test	CACB	5.25	0.69	0.11	25.21	0.000.	3.43	4.0237
	CFNB	1.52	0.76	0.10				
Time for active SLR (h)	CACB	5.79	0.87	0.12	− 27.11	0.000.	− 17.65	− 15.24
	CFNB	22.24	4.11	0.58				
Time for quadstick ambulation (h)	CACB	10.52	1.79	0.25	− 27.02	0.000.	− 12.837	− 11.08
	CFNB	22.48	2.51	0.35				
Time for staircase competency (h)	CACB	24	0.0	0.0	− 19.71	0.000.	− 20.95	− 17.12
	CFNB	43.04	6.69	0.94				
Ambulation distance at discharge (m)	CACB	92.08	10.85	1.56	31.6	0.000.	51.28	58.16
	CFNB	37.36	5.54	0.78				
Length of hospital stay (days)	CACB	3.08	0.34	0.05	− 10.35	0.000.	− 0.997	− 0.676
	CFNB	3.92	0.44	0.06				
Maximum flexion at discharge (degrees)	CACB	107.2	8.93	1.28	1.659	0.100	− 0.608	6.79
	CFNB	104.2	9.49	1.34				

CACB continuous adductor canal block group, CFNB continuous femoral nerve block group, SDV standard deviation, SEM standard error of mean, sig. significance, CI confidence interval, TUG timed up and go, SLR straight leg raising, ability and early functional recovery in comparison to femoral nerve block post TKA. Moreover, it was not associated with increased incidence of complications. Ambulation ability of patients assessed by TUG test, 10-m walk test and 30-s chair test showed better results in CACB group. In addition, all patients in CACB group performed the ambulation test whereas 6 patients in CFNB group were not willing for the tests either for the pain and discomfort or for the fear of falling. Furthermore, time to active SLR, quadstick ambulation and staircase competency were significantly earlier in CACB group. In addition, ambulation distance at discharge was significantly greater in the CACB group than in the CFNB group. Similar results were shown by Jaeger et al [11] in their study on comparison of adductor canal and femoral nerve block in healthy volunteers. Likewise, few similar studies [12,26] reported superior motor function preservation and ambulation ability with adductor canal block.

Femoral nerve block causes profound motor blockade resulting in quadriceps muscle strength weakness. A previous study reported reduction in quadriceps strength by almost 80% [10] with FNB even in very low dose/low volume in human volunteers. Also, a similar study by Jaeger et al [11] showed that quadriceps strength reduces by 49% in healthy subjects. On the other hand, ACB is almost a pure sensory nerve block that only affects the motor function of vastus medialis due to its effect on nerve to the muscle as it traverses the adductor canal. Moreover, ACB reduces quadriceps strength by only 8% as described by Jaeger et al [11] as a most important finding of their study on healthy volunteers. Furthermore, a recent clinical trial [12] reported relative sparing of quadriceps strength 6–8 h post anesthesia with ACB. A previous study on volunteers [27] concluded that ultrasound-guided ACB spares motor function and balance compared with FNB. Moreover, a recent randomized controlled trial [28] concluded that ACB preserved quadriceps muscle strength better than FNB.

There has been recent emphasis on episodes of falls associated with peripheral nerve blocks of femoral nerve. Furthermore, several studies have reported falls after femoral nerve block [13–16] as it affects all four components of the quadriceps muscle resulting in buckling or fall. On the contrary, ACB results in weakness of only vastus medialis and thus theoretically greatly reduce the chances of fall. Several studies [12,17,19,26,29] had shown no clinical apparent motor blockade or fall episodes with adductor canal block in post TKA patients. In our study, none of the patients from either group had fall during their hospital stay, especially because of comprehensive preventive measures taken at the center. However, two patients in CFNB group had buckling but no fall on POD1. Preventive strategies included assessment of risk for fall once per shift in a three-shift day, flagging and close supervision of high risk patients and implementation of interventions specific to risk factors.

The findings of the present study did not support the hypothesis that CACB provides significantly better analgesia than CFNB. No statistical significant difference was observed in pain relief evaluated as VAS score, during postoperative period at 4, 8, 12, 24 h between the two block groups. Also, pain at rest and pain after mobilization on POD1 and POD2 did not differ significantly between the two groups. Although, the pain scores were relatively lower in both groups, it was better in the CACB group than in the CFNB group (Table 3). Moreover, 5 patients in the CFNB group required rescue analgesia in the form of inj. tramadol 50 mg in normal saline whereas 2 patients in the CACB group required the rescue analgesia used in our study. Our findings concur with recently published studies [12,26,28] that showed no significant difference in pain relief and opioid consumption between adductor canal and femoral nerve block. However, every patient, in our study, were given basic regime including inj. diclofenac sodium 75 mg in 100 cc NS 8 hourly and tab paracetamol 500 mg every 6 h for pain control. In addition, it is important to note that none of the blocks can provide complete analgesia around the knee per se and thus evaluation of different analgesic techniques alone or in combination is warranted. Both CACB and CFNB provided better analgesia, however CACB was superior to CFNB but without any statistical significance.

Peripheral nerve blocks have enjoyed considerable success with definite advantages. However, it may be related to few noteworthy complications like nerve injury, catheter site infection [30], and heel ulcers [31]. There were no such complications in both the study populations. One patient each had nausea and single episode of vomiting in both the groups, which were managed accordingly. Likewise, in our study, patients in the CACB group showed a significant difference with respect to length of hospital stay. Length of hospital stay has a direct impact on health economy as well as psychological behavior of the patients. Several studies [32,33] demonstrated the interventions undertaken to accelerate the post-operative recovery and thus reduce the length of hospital stay.

All blocks were performed by a senior anesthetist with considerable experience in US guided peripheral nerve blocks. The success rate of the adductor canal block was 96%. This was comparable to success rate in other US guided adductor [12,19,29] and saphenous nerve block [34,35]. There were no failures in the CFNB group. The mean time for adductor block catheter placement was 4.93 min that was significantly more as compared to femoral nerve block with a mean time of 3.72 min. However, the time for catheter placement did not add significant time to the primary surgical procedure. We used high volume about 30 ml of 0.75% ropivacaine in continuous adductor canal group. This large volume of local anesthetic is required to fill the adductor aponeurotic space even in its distal extent where the posterior branch of obturator nerve joins the canal as demonstrated by Lund et al [17] in their study on CACB. Moreover, we preferred intermittent boluses of local anesthetic over continuous infusions especially in CACB to ensure the adequate spread throughout the adductor canal. Multiple previous studies [36,37] have shown that intermittent boluses provide superior analgesia compared with continuous infusions via an epidural catheter, even though the mechanism is unknown.

Several limitations to the study should be noted. First, regarding the study patient population, 72% (71/98) of our patients were women. Furthermore, our patients tended to be elderly (mean age >65 years old). Moreover, because factors, such as, age, gender, and ethnicity probably influence pain perception, these cohort-related characteristics should be considered before foreseeing our findings to patient populations in different part of the world. Second, in addition to the block, patients in both study groups also received continuous mode IV-PCA and oral analgesics for pain control, because we believed that the removal of routine pain control for study purposes would be unethical. Thus evaluation of block role in pain control may not be precisely depicted by our results. Third, we had not applied any specific monitoring devices to measure the adverse effects of ropivacaine use as anesthetic drug for block; instead, patients were monitored closely for clinical symptoms. Furthermore, no assessments of serum levels of ropivacaine were undertaken, and thus, we failed to determine whether the levels rose beyond the toxic threshold after large volume administration for block in both groups. However, no patients developed a ropivacaine-related toxicity or complication. Fourth, the assessment timings for ambulation ability 24 h after surgery might have differed because surgeries were completed at varied times during a day, and the evaluation was performed at a fixed time point. Furthermore, assessment by a single investigator in a ward is considered to be more reliable than assessments performed by different inpatient care providers.

In conclusion, continuous adductor canal blockade provided better ambulation ability and faster recovery post TKA as compared to continuous femoral nerve block. However, the analgesic effect showed no significant difference among the two groups. Therefore, CACB is a quadriceps sparing, pure sensory nerve block with considerable success rate, and can be a useful adjunct for acute postoperative pain management and consequently faster recovery and successful rehabilitation of the patients undergoing primary TKA. However, further studies are required to define the best regime and any long term effect of adductor canal blockade on quadriceps function after TKA.

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