International Orthopaedics (SICOT) (2016) 40:925–933
DOI 10.1007/s00264-015-2998-x

REVIEW

Adductor canal block provides better performance after total knee arthroplasty compared with femoral nerve block: a systematic review and meta-analysis

Donghai Li[1] · Zhouyuan Yang[1] · Xiaowei Xie[1] · Jinhai Zhao[1] · Pengde Kang[1]

Received: 6 July 2015 / Accepted: 11 September 2015 / Published online: 10 October 2015

Abstract
Purpose The methods for pain control after total knee arthroplasty (TKA) vary and have been extensively studied in recent years. Femoral nerve block (FNB) is used as the standard method due to its effective pain control following TKA, but it may weaken the quadriceps strength. Adductor canal block (ACB) is a newly developing analgesic protocol with fast functional recovery and good pain control after TKA. A meta-analysis was conducted to try to find out if ACB is better than FNB in pain treatment and joint functional recovery after TKA.
Methods The databases PubMed, Web of Science, Embase, and Cochrane Library were systematically searched. Of 66 records identified, eight randomised controlled trials (RCT) involving 434 patients (504 knees) were eligible for data extraction and meta-analysis according to criteria included.
Results Meta-analysis showed that ACB can significantly decrease visual analogue scale (VAS) score at rest within eight hours ($p<0.001$) and at 24 hours ($p<0.001$) after operation compared to FNB after TKA, and improve quadriceps strength ($p<0.001$) and mobilization ability ($p<0.001$). However, the differences in VAS score at rest at 48 hours, VAS score with activity within two days after operation, opioid consumption, hip adductor strength, patient satisfaction, and tourniquet times were not significant between the two groups.
Conclusion ACB provide better ambulation ability, faster functional recovery and better pain control at rest after TKA compared to FNB. The use of ACB post TKA is worthy of being recommended to replace FNB as a standard analgesic protocol for pain treatment after TKA.

Keywords Total knee arthroplasty · Femoral nerve block · Adductor canal block · Meta-analysis

Donghai Li and Zhouyuan Yang contributed equally to this work.

✉ Pengde Kang
kangpd@163.com

Donghai Li
m13880025417@163.com

Zhouyuan Yang
yangzhouyuan1986@163.com

Xiaowei Xie
xiexiaowei88@qq.com

Jinhai Zhao
85622463@qq.com

[1] Department of Orthopaedics, West China Hospital, Sichuan University, 37# Wainan Guoxue Road, Chengdu, Sichuan 610041, People's Republic of China

Introduction

Total knee arthroplasty (TKA) is an effective and satisfactory surgery to treat end-stage knee arthritis [1]. However, patients following TKA usually suffer a lot from undesirable pain [2]. Analgesia used for patients with TKA post-operatively are various, such as neuraxial procedures, local anaesthetic infiltration, nerve blockade and so on. Femoral nerve block (FNB) is one of the most commonly used nerve blockade methods, which has been proven to be effective in reducing the usage rate of opioid painkiller and shortening hospital stays [3]. However, FNB may lower the quadriceps strength, delay patients' post-operative activity time and increase the risk of falling [4].

Adductor canal block (ACB) is another analgesia and has developed gradually in recent years, which attracted

extensive attention due to its higher successful pain control rate and lower complication incidence after TKA in the latest studies [5–7]. The adductor canal is a cavity surrounded by the sartorius muscle, medial femoral muscle, and the adductor muscles. ACB could relieve pain without compromising motor function through blocking the saphenous nerve which is the terminal sensory branch of the femoral nerve [5, 6]. Several recent randomized controlled trials (RCT) found that patients with ACB could suffer less pain at rest or during knee flexion, and were at decreased risk of compromising quadriceps strength and consumed less opioid painkiller after operation [7, 8].

Choosing an effective and safe analgesia is necessary to accelerate patients' recovery after the surgery. Therefore, in the present study, we are aimed at determining whether ACB makes a better performance for post-operative pain control and functional recovery for patients after TKA compared with FNB.

Materials and methods

Search strategy

We identified randomized controlled trials from 1974 to 2nd May 2015 by searching databases including PubMed, Web of Science, Embase and Cochrane Library using the following terms: (total knee arthroplasty or total knee replacement) AND (adductor canal block or saphenous nerve block) AND (femoral nerve block). In addition, the reference lists of review articles, all reports and additional trials are also included by manual search.

Inclusion criteria

RCTs that compared the analgesic effect of ACB with FNB for TKAs were included. Given that ACB was also sometimes mentioned as saphenous nerve block, RCTs which compared saphenous nerve block with FNB were also included. The dosages and types of anaesthesia drug administrated were not limited. Eligible studies were selected based on criteria aforementioned by two reviewers. Any disagreement between them was resolved by consensus.

Data extraction

We extracted the following data from the included articles: publishing date, location of study, numbers of patients in each group, demographic data of participants including age, gender, indication for TKA, dosages and kinds of anaesthesia drug administrated, primary outcomes including visual analog scale (VAS) scores at rest and at an active flexion of knee which were evaluated within the first post-operative 48 hours; secondary outcomes containing opioid consumption within the first post-operative 24 hours; third outcomes including the quadriceps strength and hip adductor strength within the first post-operative 24 hours and mobilization ability (TUG test); and fourth outcomes containing patient satisfaction and tourniquet times. If necessary, we attempted to contact the author of the original reports to obtain further details. The data extraction was made by two reviewers. Likewise, any disagreement between them was resolved by consensus.

Study quality

Each study that was included in the analysis was assessed independently by each author. The assessment was performed using the modified Jadad scale for systematic reviews [9]. Studies achieving a score of ≥4 points were considered to be of high quality.

Statistical analysis

Review Manager Software (Revman 5.3, Cochrane Collaboration, Oxford, United Kingdom) was used for the meta-analysis. The continuous variable outcomes (VAS pain scores within the first post-operative 48 hours, opioid usage within the first post-operative 24 hours, the quadriceps strength and hip adductors within the first post-operative 24 hours and TUG test within the first post-operative 24 hours) for meta-analysis were presented as mean difference (MD) and with 95 % confidence interval (95 % CI) while dichotomous outcomes presented as odds ratio (OR) with 95 % CI. Heterogeneity among the studies was evaluated using the I^2 statistic and chi-squared test. Sensitivity analysis was performed to explore the impact of an individual study by deleting one study each time. Publication bias was visually examined by funnel plots.

Results

Search results

Initially, 66 records were identified from databases. Among them, 45 articles were excluded from primary screening. The remaining 21 were screened secondly to obtain potentially eligible articles. Finally, only 13 RCTs comparing ACB or saphenous nerve block with FNB were included. Unexpectedly, two works were excluded because of lack of original data and another three articles were excluded for being case control studies [10–12]. At last, eight articles were found to fulfill the inclusion criteria [13–20] (Fig. 1), which were similar to each other concerning basic characteristics (Table 1). A total of 434

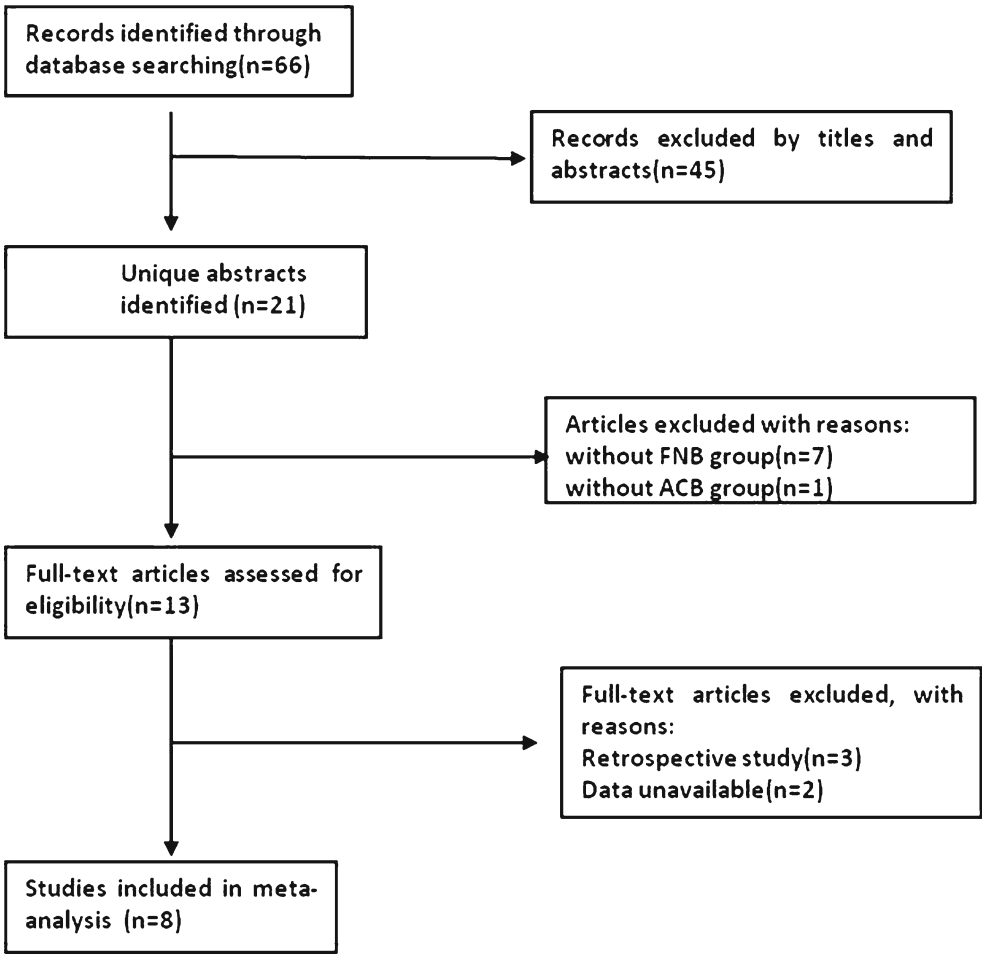

Fig. 1 Flow chart of study selection

patients (504 knees) were included in the eight trials: 249 patients (249 knees) in the ACB group, and 255 patients (255 knees) in the FNB group. The eight articles were assessed independently using the modified Jadad scale (minimum of four points and maximum of seven points, the average score was 6.5 points, Table 2).

VAS score at rest

Five studies with 418 knees showed VAS score within 8 h post-operatively, and a significant difference was found between the ACB and the FNB groups (*MD*=−0.17; 95 %CI, −0.27 to −0.07; Fig. 2). Five studies with 418 knees showed

Table 1 Characteristics of included studies

Study	Study design	Study location	Sample size	Mean age	Sex (male/female)
Memtsoudis (2015)	RCT	USA	59	64.4	26/33
Grevstad (2015)	RCT	Denmark	49	64.5	15/35[a]
Zhang (2014)	RCT	China	60	62.8	14/46
Kim (2014)	RCT	USA	93	67.8	40/53
Kwofie (2013)	RCT	USA	16	29	NR
Jaeger1 (2013)	RCT	Denmark	48	68	19/31[a]
Jaeger2 (2013)	RCT	Denmark	11	24	11/0
Nilen (2014)	RCT	India	98	67.1	27/71

RCT randomized controlled trial, *NR* not reported

[a] Some cases were lost during original study

Table 2 Modified Jadad score

Study	Randomization	Concealment of allocation	Double blinding	Total withdrawals and dropouts	Total
Memtsoudis (2015)	**	*	**	*	6
Grevstad (2015)	**	**	**	*	7
Zhang (2014)	*	*	*	*	4
Kim (2014)	**	**	**	*	7
Kwofie (2013)	**	**	**	*	7
Jaeger1 (2013)	**	**	**	*	7
Jaeger2 (2013)	**	**	**	*	7
Nilen (2014)	**	**	**	*	7

Each asterisk represents one point. Modified Jadad score was used to evaluate the quality of articles, and studies achieving a score of ≥4 points were considered to be of high quality

VAS score at 24 hours post-operatively. Meta-analysis showed that ACB had lower VAS score than the FNB group (*MD*= −0.41; 95 % CI, −0.53 to −0.29; Fig. 2). Only four studies with 369 knees reported the VAS score at 48 hours post-operatively. Meta-analysis revealed no significant differences between the two groups (*MD*=−0.06; 95 %CI, −0.15 to 0.03; Fig. 2).

VAS score with activity

Only three studies with 227 knees showed VAS score with activity within six hours post-operatively. No significant difference was found between the ACB and the FNB group (*MD*=0.00; 95 %CI, −0.09 to 0.09; Fig. 3). Three studies with 226 knees reported VAS score at 24 hours with activity post-operatively and the results were similar in the two groups (*MD*=0.04; 95 % CI, −0.11 to 0.20; Fig. 3). We included three studies with 276 knees that reported VAS score at 48 hours with activity post-operatively. The difference showed no statistical significance in the two groups (*MD*=−0.08; 95 % CI, −0.18 to 0.03; Fig. 3).

Opioid consumption

Three studies with 190 knees assessed opioid consumption at 24 hours post-operatively. The combined data showed no significant difference between the two groups (*MD*=−1.42; 95 %CI, − 8.41 to 5.58; Fig. 4).

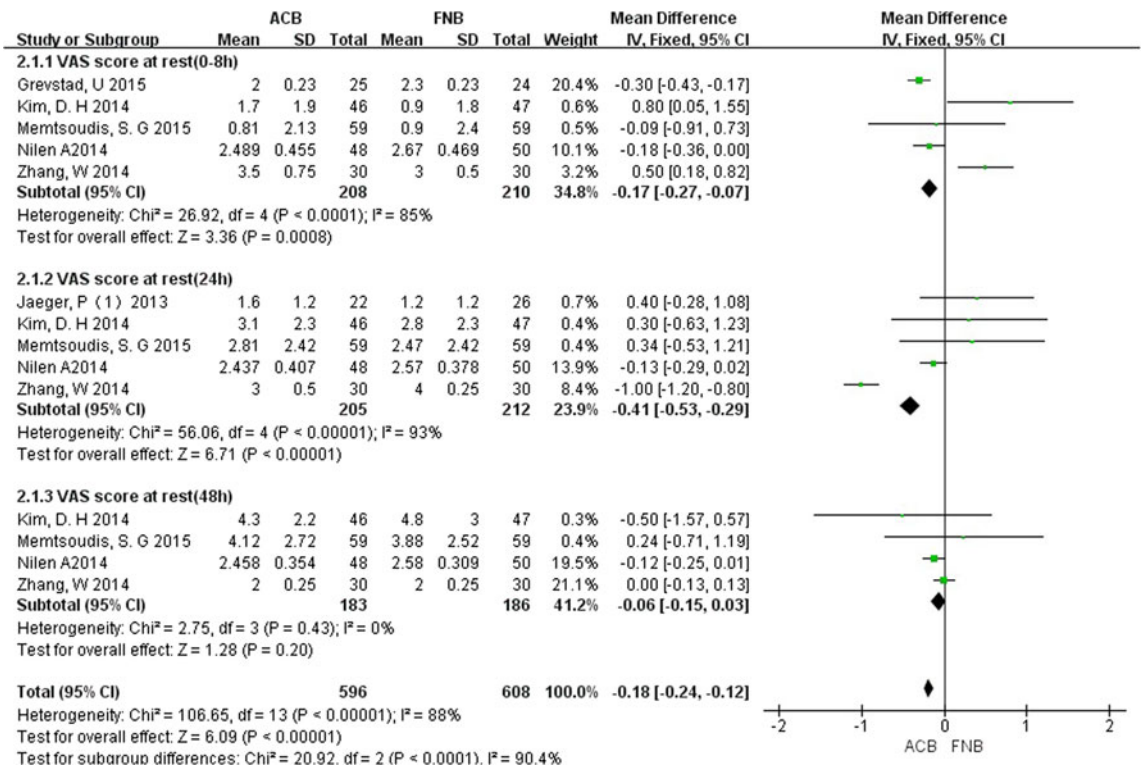

Fig. 2 Forest plot analyses of VAS pain scores at rest within post-operative 48 hours

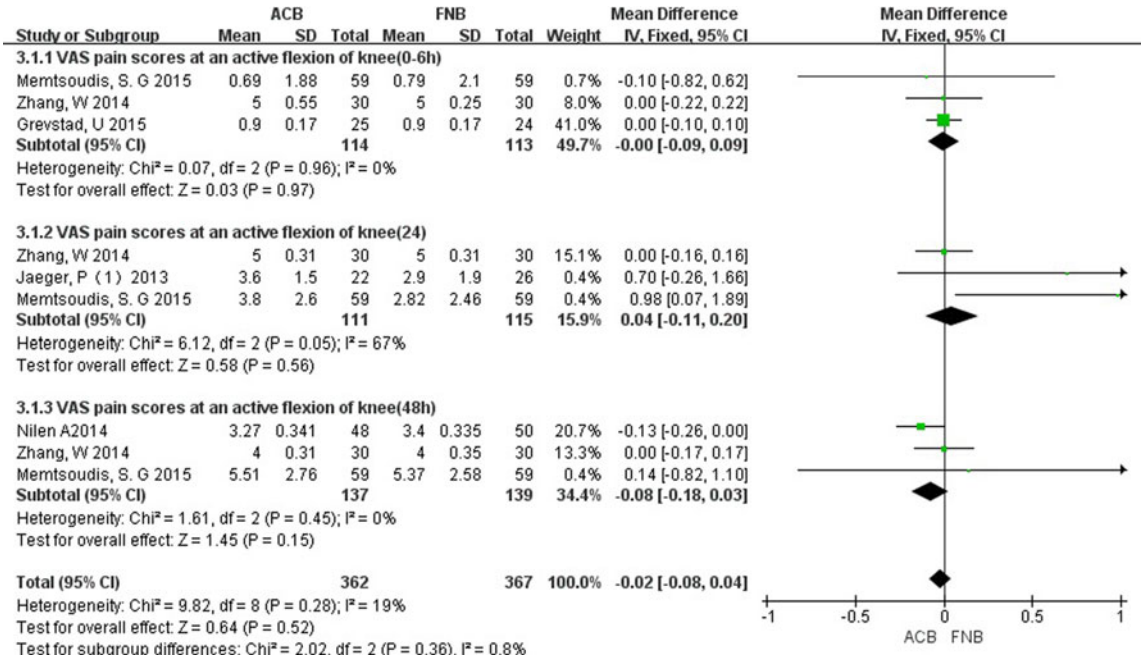

Fig. 3 Forest plot analyses of VAS pain scores with activity within post-operative 48 hours

Muscle strength

We use the quadriceps maximum voluntary isometric contraction (MVIC) to evaluate the quadriceps strength. Four studies with 135 knees showed quadriceps MVIC post-operatively. But the age of the patients revealed a big difference, so we divided patients into two subgroups: a younger group (<60 years old) and an older group (>60 years old). Meta-analysis showed that degree of knee flexion in the ACB group was much bigger than in the FNB group in both the younger group (*MD*=37.46; 95 % CI, 12.27–62.24; Fig. 5) and the older group ((*MD*=32.63; 95 % CI, 6.72–58.99; Fig. 5).

Four studies with 135 knees showed hip adductor strength post-operatively and we also divided them into a younger and an older group. Meta-analysis showed that the degrees abducted in the operated leg were not significantly different in the younger group (*MD*=1.51; 95 % CI, –0.12 to 3.15; Fig. 6) and older group (*MD*=−4.87; 95 % CI, −16.13 to 6.38; Fig. 6).

Mobilization ability (TUG test)

Four studies with 217 knees showed TUG test post-operatively. But the age of the patients also revealed a big difference so we divided them into a younger and an older group. We found that the time cost in the ACB group was less than the FNB group both in the younger group (*MD*=−5.1; 95 % CI, −6.65 to −3.35; Fig. 7) and the older group (*MD*=−15.84; 95 %CI, −29.24 to −2.43; Fig. 7).

Patient satisfaction

Two studies with 211 knees assessed patient satisfaction at eight hours and at 24 hours post-operatively. The combined data showed no significant difference at eight hours between the two groups (MD=0.17; 95 %CI, − 0.09 to 0.43), while the difference at 24 hours had statistical significance (MD=−0.63; 95 % CI, −1.18 to −0.07; Table 3).

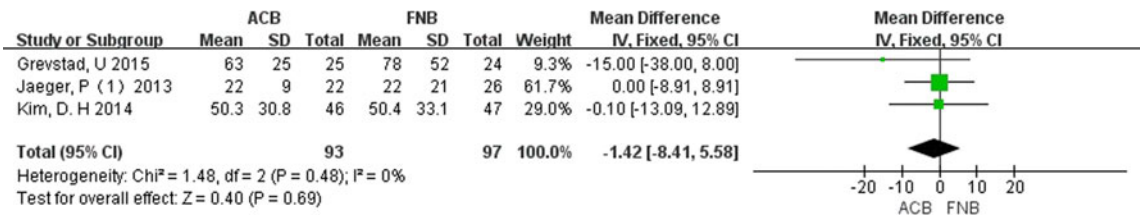

Fig. 4 Forest plot analyses of opioid consumption within post-operative 24 hours

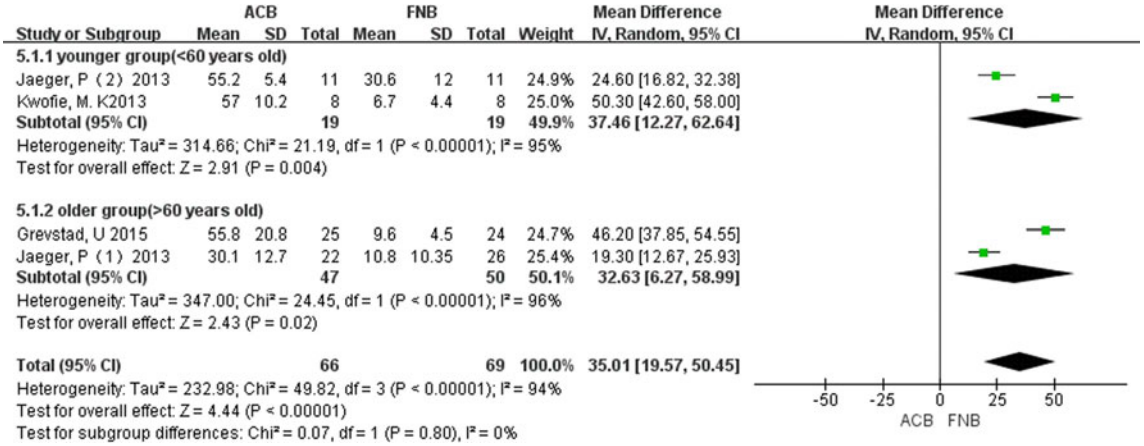

Fig. 5 Forest plot analyses of quadriceps strength. Quadriceps maximum voluntary isometric contraction was used to test quadriceps strength

Tourniquet time

Another two studies with 167 knees reported the tourniquet times post-operation. Meta-analysis revealed no significant differences between the two groups (*MD*=−0.28; 95 %CI, −4.07 to 4.63; Table 3).

Discussion

This meta-analysis was conducted try to find out if ACB is better than FNB in pain treatment and joint functional recovery, and it analyses which one is more available to be used after TKA. In the previous studies, the ACB was proven to be equivalent to the saphenous block [5, 21]. A recent meta-analysis [6] showed that saphenous nerve block has a good effect on pain relief both during activity and at rest after knee surgery. The FNB, which was supposed to be the standard method for post-operative pain treatment after TKA, had some severe side effects, such as reducing quadriceps muscle strength, delaying mobilization [13, 20] and being associated with the risk of falling [22]. The ACB, however, was not shown to have these side effects.

In our meta-analysis, the ACB group had lower pain scores in the early period of post-operation (<24 h) at rest compared to the FNB group, but the difference at 48 hours had no statistical significance. In forest plot, the I² was greater than 50 %, which means heterogeneity test shows a statistical significance. From the related trials [13–17], the heterogeneity may be caused by several reasons. First, the different race of the cases. Two trials came from Asia and six were from Europe or America. Second, two trials were bilateral TKA, while six trials were unilateral TKA, which may have an effect on the VAS scores. Third, mean age was different in the included articles. Fourth, in some of the studies, we need to estimate the mean and variance from the median, range, and the size of a sample (range= maximum–minimum). In the study of Hozo et al. [23], median can be used to estimate mean when the sample size is larger than 25. When sized samples were moderate ($15<n\leq70$), the formula range/4 is the best estimator for the standard deviation. For large samples ($n>70$), the formula range/6 gives the best estimator for the standard deviation; thus, it may influence our results.

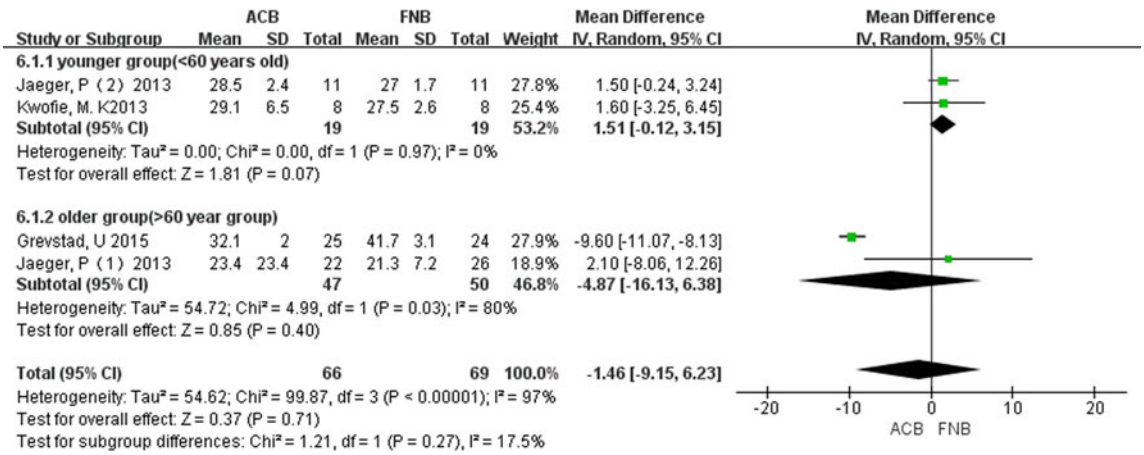

Fig. 6 Forest plot analyses of hip adductors muscle strength. The degrees abducted in the operated leg were used to test adductors muscle strength

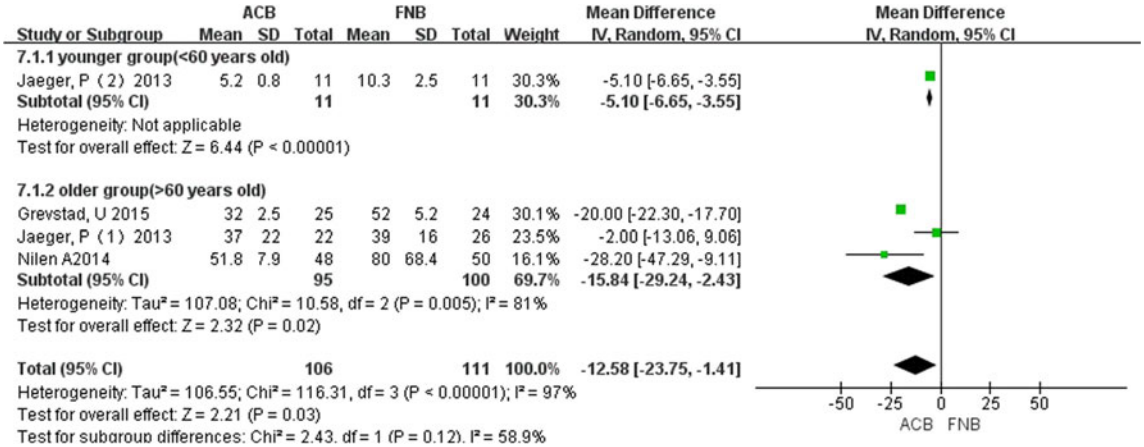

Fig. 7 Forest plot analyses of mobilization ability. TUG test(s) was used to test mobilization ability

The quadriceps strength and TUG(s) test results in the ACB group after operation were much better than that in the FNB group both in the younger group and the older group. In fact, there were many other comparisons used in the articles that can evaluate the quadriceps strength and mobilization ability. For example, quadriceps strength can be estimated by using a manual muscle test with a standardised 0–5 motor-strength scale, and the quadriceps strength was better in the ACB group [14, 17]. Furthermore, in the study of Kim et al. [15], the patient's quadriceps strength was assessed by a neurologic exam, based on a 12-point scale, and the results were also better in the ACB group.

According to Jenstrup et al. [24], the ACB may provide unwanted analgesia by blocking these obturator fibres in addition to the femoral articular branches. But, in our meta-analysis, there were no differences in the two subgroups. Our

Table 3 Results of meta-analysis

Outcomes	Studies	Number of knees	MD (95 % CI)	Heterogeneity(I^2)
VAS score at rest				
0–8 h	5	418	−0.17 (−0.27.−0.07)	85 %
24 h	5	417	−0.41 (−0.53,−0.29)	93 %
48 h	4	369	−0.06 (−0.15,0.03)	0 %
VAS score with activity				
0–6 h	3	227	−0.00 (−0.09,0.09)	0 %
24 h	3	226	0.04 (−0.11.0.20)	67 %
48	3	276	−0.08 (−0.18,0.03)	34.4 %
Opioid consumption	3	190	−1.42 (−8.41,5.58)	0 %
Quadriceps strength				99 %
Younger group (<60 years)	2	38	37.46 (12.27,62.24)	95 %
Older group (>60 years)	2	97	32.63 (6.72,58.99)	96 %
Hip adductor strength				
Younger group (<60 years)	2	38	1.51 (−0.12,3.15)	0 %
Older group (>60 years)	2	97	−4.87 (−16.13,6.38)	80 %
TUG test(s)				
Younger group (<60 years)	1	22	−5.1 (−6.65,−3.35)	Not applicable
Older group (>60 years)	4	217	−15.84 (−29.24,−2.43)	81 %
Patient satisfaction				
8 h	2	211	0.17 (−0.09, 0.43)	0 %
24 h	2	211	−0.63 (−1.18, −0.07)	0 %
Tourniquet times	2	167	0.28 (−4.07, 4.63)	0 %

ACB adductor canal block, *FNB* femoral nerve block, *TKA* total knee arthroplasty, *MD* mean difference, *95 %CI* 95 % confidence interval

I^2 >50 % means the heterogeneity test revealed a statistical significance

results suggested that the ACB would not weaken the adductor muscle.

Besides the TUG test, there were many other methods for evaluating mobilization ability and similarly better results were seen in the ACB group too, with methods such as a ten metre walk test (s), 30 second chair test [20] and ambulation distance at discharge [10–12, 25].

VAS scores with activity in the two groups were similar and the opioid consumption also showed no difference. Patient satisfaction score in the two groups at eight hours after operation had no difference, while the score in the FNB group was higher at 24 hours. But only two trials were analysed and the combined data may produce bias, so we can't consider the FNB as better. What's more, FNB didn't show any advantage compared with ACB for the rate of complications [15], hospital stays [15], and tourniquet times. These results may be influenced by the limited cases, but in our study, we can't support the hypothesis that the FNB has any advantages in these fields.

According to Lund et al. [20, 26], ACB is a sensory block and theoretically it has no adverse effects on the motor function of joint. Our results demonstrate that patients with ACB had better post-operative outcomes of ambulation ability and early functional recovery such as the quadriceps strength and TUG test, in comparison to FNB after TKA. Traditionally, FNB is considered as the standard for analgesia, providing optimal pain relief after TKA [27, 28]. However, in our study, the difference in VAS scores with activity between the FNB group and the ACB group was not significant, while the VAS scores at rest were better in ACB. So, adopting ACB for patients undergoing TKA could achieve better satisfactory pain control compared with FNB.

There are several limitations to our study. First, there were only eight trials and 504 knees were included in our study, which seemed relatively small and may be the reason that there were no differences in several results of comparison, such as the VAS score with activity and opioid consumption. Furthermore, funnel plots were not available because of limited eligible studies, which haven't shown any significance because of the limited cases. Second, the anaesthesia methods in these trials were different, which may influence the post-operative pain scores. Third, besides the ACB or FNB, many other analgesia methods were used in different trials, which may produce some bias too. Fourth, we just analysed the short-term effects after operation and didn't know what the difference may be in the long run. Thus, further research should be done.

Conclusion

ACB provide better ambulation ability, faster functional recovery and better pain control at rest after TKA compared to FNB. The use of ACB post TKA is worthy of being recommended to replace FNB as a standard method for post-operative pain treatment after TKA.

References

1. Yang Z, Liu H, Xie X, Kang P et al (2014) The influence of diabetes mellitus on the post-operative outcome of elective primary total knee replacement: a systematic review and meta-analysis. Bone Joint J 96:1637–1643
2. Xie X, Pei F, Huang Z, Tan Z, Yang Z, Kang P (2015) Does patellar denervation reduce post-operative anterior knee pain after total knee arthroplasty? Knee Surg Sports Traumatol Arthrosc 23:1808–1815
3. Paul JE, Arya A, Hurlburt L, Cheng J (2010) Femoral nerve block improves analgesia outcomes after total knee arthroplasty: a meta-analysis of randomized controlled trials. Anesthesiology 113:1144–1162
4. Atkinson HD, Hamid I, Gupte CM (2008) Post-operative fall after the use of the 3-in-1 femoral nerve block for knee surgery: a report of four cases. J Orthop Surg (Hong Kong) 16:381–384
5. Andersen HL, Zaric D (2014) Adductor canal block or midthigh saphenous nerve block same but different name! Reg Anesth Pain Med 39:256–257
6. Jin SQ, Ding XB, Tong Y (2015) Effect of saphenous nerve block for post-operative pain on knee surgery: a meta-analysis. Int J Clin Exp Med 8:368–376
7. Hanson NA, Allen CJ, Hostetter LS, Nagy R (2014) Continuous ultrasound-guided adductor canal block for total knee arthroplasty: a randomized, double-blind trial. Anesth Analg 118:1370–1377
8. Jæger P, Koscielniak-Nielsen ZJ, Schrøder HM (2014) Adductor canal block for post-operative pain treatment after revision knee arthroplasty: a blinded, randomized, placebo-controlled study. PLoS One 9:e111951
9. Oremus M, Wolfson C, Perrault A, Demers L, Momoli F, Moride Y (2001) Interrater reliability of the modified Jadad quality scale for systematic reviews of Alzheimer's disease drug trials. Dement Geriatr Cogn Disord 12:232–236
10. Rasmussen M, Kim E, Kim T et al (2015) A retrospective comparative provider workload analysis for femoral nerve and adductor canal catheters following knee arthroplasty. J Anesth 29:303–307
11. Patterson ME, Bland KS, Thomas LC et al (2015) The adductor canal block provides effective analgesia similar to a femoral nerve block in patients undergoing total knee arthroplasty–a retrospective study. J Clin Anesth 27:39–44
12. Mudumbai SC, Kim TE, Howard SK et al (2014) Continuous adductor canal blocks are superior to continuous femoral nerve blocks in promoting early ambulation after TKA. Clin Orthop Relat Res 472:1377–1383
13. Grevstad U, Mathiesen O, Valentiner LS, Jaeger P, Hilsted KL, Dahl JB (2015) Effect of adductor canal block versus femoral nerve block on quadriceps strength, mobilization, and pain after total knee arthroplasty: a randomized, blinded study. Reg Anesth Pain Med 40:3–10
14. Memtsoudis SG, Yoo D, Stundner O, Danninger T et al (2015) Subsartorial adductor canal vs femoral nerve block for analgesia after total knee replacement. Int Orthop 39:673–680
15. Kim DH, Lin Y, Goytizolo EA, Kahn RL et al (2014) Adductor canal block versus femoral nerve block for total knee arthroplasty: a prospective, randomized, controlled trial. Anesthesiology 120:540–550

16. Shah NA, Jain NP (2014) 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. J Arthroplast 29:2224–2229
17. Zhang W, Hu Y, Tao Y et al (2014) Ultrasound-guided continuous adductor canal block for analgesia after total knee replacement. Chin Med J (Engl) 127:4077–4081
18. Jæger P, Zaric D, Fomsgaard JS et al (2013) Adductor canal block versus femoral nerve block for analgesia after total knee arthroplasty: a randomized, double-blind study. Reg Anesth Pain Med 38:526–532
19. Kwofie MK, Shastri UD, Gadsden JC et al (2013) The effects of ultrasound-guided adductor canal block versus femoral nerve block on quadriceps strength and fall risk: a blinded, randomized trial of volunteers. Reg Anesth Pain Med 38:321–325
20. Jaeger P, Nielsen ZJ, Henningsen MH et al (2013) Adductor canal block versus femoral nerve block and quadriceps strength a randomized, double-blind, placebo-controlled, crossover study in healthy volunteers. Anesthesiology 118:409–415
21. Lund J, Jenstrup MT, Jaeger P, Sørensen AM, Dahl JB (2011) Continuous adductor-canal-blockade for adjuvant post-operative analgesia after major knee surgery: preliminary results. Acta Anaesthesiol Scand 55:14–19
22. Ilfeld BM, Duke KB, Donohue MC (2010) The association between lower extremity continuous peripheral nerve blocks and patient falls after knee and hip arthroplasty. Anesth Analg 111:1552–1554
23. Hozo SP, Djulbegovic B, Hozo I (2005) Estimating the mean and variance from the median, range, and the size of a sample. BMC Med Res Methodol 5:13
24. Jenstrup MT, Jæger P, Lund J et al (2012) Effects of adductor-canal-blockade on pain and ambulation after total knee arthroplasty: a randomized study. Acta Anaesthesiol Scand 56:357–364
25. Perlas A, Kirkham KR, Billing R et al (2013) The impact of analgesic modality on early ambulation following total knee arthroplasty. Reg Anesth Pain Med 38:334–9
26. Lund J, Jenstrup MT, Jaeger P, Sorensen AM, Dahl JB (2011) Continuous adductor-canal-blockade for adjuvant post-operative analgesia after major knee surgery: preliminary results. Acta Anaesthesiol Scand 55:14–19
27. Campbell A, McCormick M, McKinlay K et al (2008) Epidural vs. lumbar plexus infusions following total knee arthroplasty: randomized controlled trial. Eur J Anaesthesiol 25:502
28. Fowler SJ, Symons J, Sabato S et al (2008) Epidural analgesia compared with peripheral nerve blockade after major knee surgery: a systematic review and meta-analysis of randomized trials. Br J Anaesth 100:154