Spinal anesthesia with bupivacaine and fentanyl associated with femoral nerve block in postoperative analgesia in the reconstruction of the anterior cruciate ligament

Raquianestesia com bupivacaína e fentanil associada ao bloqueio do nervo femoral na analgesia pós-operatória na reconstrução do ligamento cruzado anterior

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ABSTRACT

BACKGROUND AND OBJECTIVES: To evaluate postoperative analgesia and the need for tramadol in patients undergoing reconstruction of the anterior cruciate ligament with spinal anesthesia, fentanyl and femoral nerve block.
METHODS: 166 patients were divided into four groups (G). All patients received spinal anesthesia with 15mg of isobaric bupivacaine at 0.5%. In the G2 and G3 groups, 25μg of fentanyl was associated with bupivacaine and in groups G3 and G4 femoral nerve block was associated with 100mg of bupivacaine at 0.5%, without vasoconstrictor. Patients received timed dipyrone and ketoprofen and were instructed to request tramadol if the pain was ≥4 on the numerical scale. After 6, 12 and 24 hours of spinal anesthesia, the score was recorded on the numerical scale, the request of tramadol and adverse events.
RESULTS: Mean pain scores at 6 and 24 hours were not different. In the 12-hour evaluation, there was a difference only in G4 in relation to G1 (p=0.01). Tramadol was requested by 46.7% in G1, 52.9% in G2, 18.6% in G3 and 36.4% in G4 (p=0.009), with a difference between G1 and G3 and also between G2 and G3.
CONCLUSION: The association of spinal anesthesia and femoral nerve block in G4 provided lower pain scores in the evaluation at 12 hours after anesthesia. On the other hand, the highest indices were observed in G2, spinal anesthesia with fentanyl. Pain scores at 6 and 12 hours were similar. The highest consumption of analgesics occurred in those who reported more pain in G2.

Keywords: Anterior cruciate ligament reconstruction, Femoral nerve block, Fentanyl, Spinal anesthesia.

RESUMO

JUSTIFICATIVA E OBJETIVOS: Avaliar a analgesia pós-operatória e a necessidade de tramadol nos pacientes submetidos à operação de reconstrução do ligamento cruzado anterior com raquianestesia, fentanil e bloqueio do nervo femoral.
MÉTODOS: Cento e sessenta e seis pacientes foram divididos em quatro grupos (G). Todos os pacientes receberam raquianestesia com 15mg de bupivacaína isobárica a 0,5%. Nos grupos G2 e G3 foi associado 25μg de fentanil à bupivacaína e nos grupos G3 e G4 foi associado bloqueio do nervo femoral com 100mg de bupivacaína a 0,5% sem vasoconstritor. Os pacientes receberam dipirona e cetoprofeno de horário e eram orientados a solicitar tramadol caso a dor estivesse ≥4 na escala numérica. Após 6, 12 e 24 horas da raquianestesia foi registrado o escore na escala numérica, a solicitação de tramadol e eventos adversos.
RESULTADOS: Os escores médios de dor 6 e 24 horas não foram diferentes. Na avaliação 12 horas houve diferença apenas no G4 em relação ao G1 (p=0,01). O tramadol foi solicitado por 46,7% no G1, 52,9% no G2, 18,6% no G3 e 36,4% no G4 (p=0,009), com diferença entre G1 e G3 e também entre G2 e G3.
CONCLUSÃO: A associação de raquianestesia e bloqueio do nervo femoral no G4 proporcionou menores escores de dor na avaliação 12 horas após a anestesia, por outro lado os índices mais elevados foram observados na raquianestesia com fentanil do G2. As avaliações de dor em 6 e 12 horas foram semelhantes. O maior consumo de analgésicos ocorreu naqueles que relataram mais dor no G2.

Descritores: Bloqueio do nervo femoral, Fentanil, Raquianestesia, Reconstrução do ligamento cruzado anterior.

INTRODUCTION

Adequate analgesia is essential to minimize the suffering of the patient after surgical intervention. Inadequate management of postoperative pain generates discomfort, anxiety, alteration in the sleep pattern and delays the recovery and the return to normal life and work activities[1-3].

The anterior cruciate ligament reconstruction surgery (ACL) can present a painful postoperative period, and several techniques can be used for the analgesia, one of them is the femoral nerve block (FNB)[2-6].

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Cases of ACLR treated with general anesthesia associated with a peripheral nerve block and/or intra-articular injection[3,7-11], epidural anesthesia[12] and spinal anesthesia[4-6,13,14] were found. The administration of spinal anesthesia with isobaric bupivacaine combined with FNB with bupivacaine at 0.5% has been previously evaluated[15]. However, the technique associated with fentanyl has not been described in the literature so far.

In 2008, Souza et al.[4] compared the FNB with ropivacaine and bupivacaine in a control group of ACLR and total knee arthroplasty when they found reduced pain scores with the use of blockage, and the patients who received FNB showed greater satisfaction with the procedure. Matava et al.[3] concluded that the use of FNB associated with general anesthesia was safe, despite not having changed the pain scores up to three days after ACLR. Guirro, Tambara and Munhoz[15] noted that patients who received FNB showed a reduction in pain scores. However, there was no difference in the consumption of rescue analgesic. Astur et al.[6] showed that FNB with ropivacaine provided lower pain scores. However, the analgesic consumption was greater after the third postoperative day, and the authors concluded that the blockade would not bring benefits.

There is no consensus in the literature about which would be the best anesthetic-analgesic technique for patients undergoing ACLR that reduces the average scores of the postoperative pain and the consumption of analgesics.

The objective of this study was to evaluate the efficacy of the isolated spinal anesthesia or the association with fentanyl in association with FNB in the treatment of postoperative pain in the first 24 hours after ACL reconstruction.

METHODS

Patients eligible for this study were those who attended in sequence to the Pre-Anesthetic Assessment Clinic and who have been admitted by the Knee Surgery Group of the Hospital do Trabalhador with an injury in the anterior cruciate ligament of the knee and candidate to ACL reconstruction between the March 2010 and March 2013. Figure 1 describes the flow of volunteer patients in the study.

Patients included were of both genders, aged between 18 and 65 years, ASA physical status 1 or 2, according to the American Society of Anesthesiologists classification, height between 1.50 and 1.90 m, weight between 50 and 110 kg, and body mass index (BMI) between 18.5 and 40 $kg.m^{-2}$. Patients excluded were those who refused to participate in the study, who had counterindication to the techniques or drugs used in the study, suspicion or confirmation of pregnancy, cognitive deficit or illiterate, current or previous history of licit or illicit drug abuse.

Patients were randomly distributed by lot into four groups, called Group 1 (G1), Group 2 (G2), Group 3 (G3) and Group 4 (G4). The distribution was according to the anesthetic technique described in table 1, and submitted to the anesthetic-surgical ACLR procedure with arthroscopic assistance, with or without concomitant meniscus and chondral surgery. Patients who underwent emergency surgeries, ACL reoperation and those who received other graft than the semitendinosus and gracillis flexor tendon in the ACL reconstruction.

In the operation room, the monitoring was performed with a pulse oximeter, cardioscope, and non-invasive blood pressure

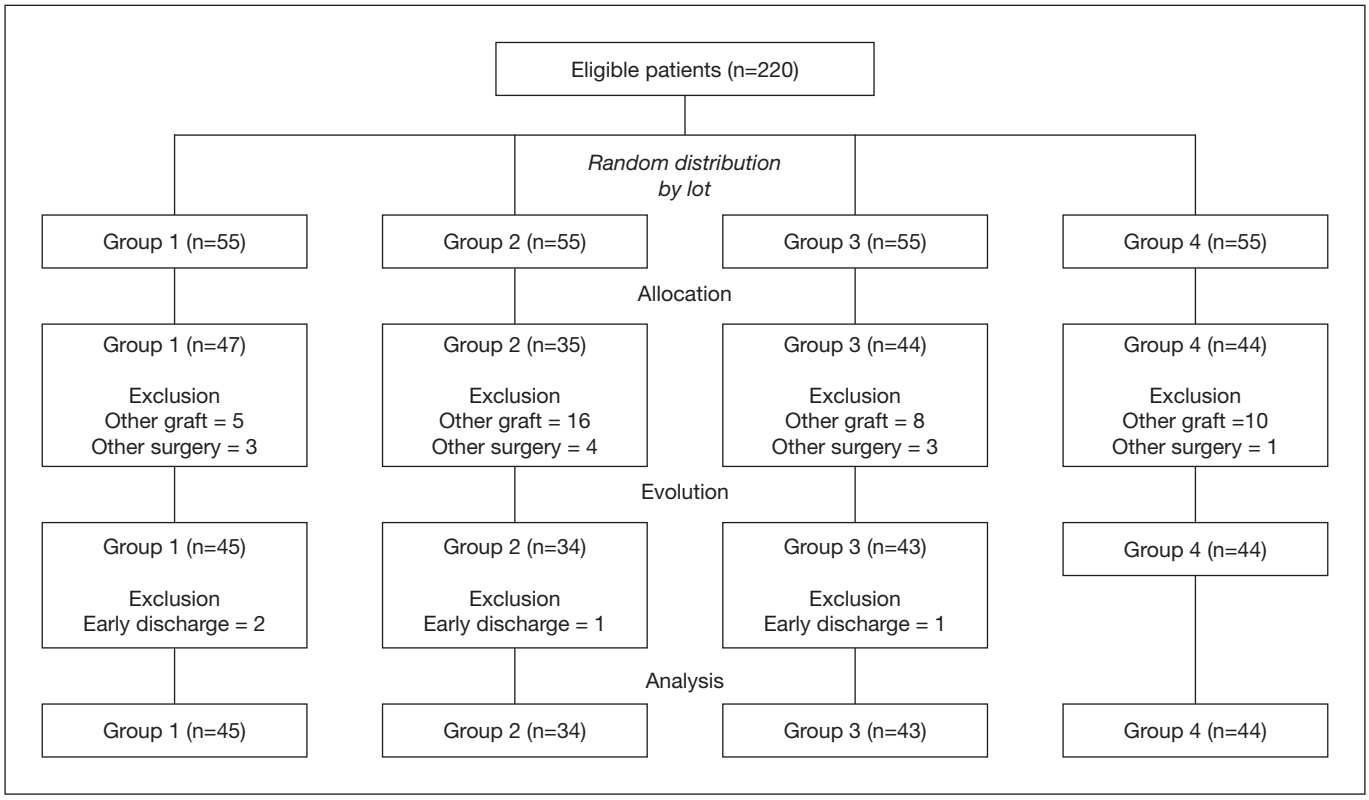

Figure 1. Flowchart of the distribution of patients in the study

Table 1. Anesthetic techniques used in the study groups

Anesthetic technique	Group 1 (G1)	Group 2 (G2)	Group 3 (G3)	Group 4 (G4)
Spinal anesthesia	15mg of isobaric bupivacaine at 0.5% (3mL)	15mg of isobaric bupivacaine at 0.5% (3mL)	15mg of isobaric bupivacaine at 0.5% (3mL)	15mg of isobaric bupivacaine at 0.5% (3mL)
Intrathecal opioid	-	Fentanyl 25µg (0.5mL)	Fentanyl 25µg (0.5mL)	-
Femoral nerve block	-	-	100mg of bupivacaine at 0.5%, without vasoconstrictor (20mL)	100mg of bupivacaine at 0.5%, without vasoconstrictor (20mL)

measurement. Venous access was with 22 or 20G catheter in the upper limb and hydration was performed with 500mL of saline at 0.9% in the first 30 minutes with the purpose of preventing hypotension associated with the spinal anesthesia, followed by 250mL per hour of surgery. In case of significant hypotension, doses of 5g of ephedrine would be used. Patients received intravenous midazolam in the maximum dose of 0.1mg.kg^{-1} until the responsive sedation to commands.

All patients received the spinal anesthesia in a sitting position, after asepsis of the skin with chlorhexidine, placement of surgical drapes, infiltration of lidocaine at 2% in the skin and in the selected intervertebral space (L3-L4, L4-L5 or L5-S1). Disposable, 27G Quincke needles were used. The subarachnoid space was identified by the spontaneous reflux of the CSF, followed by the administration of 15mg of isobaric bupivacaine at 0.5%. Patients in G2 and G3 also received 25µg of fentanyl associated with the local anesthetic. Immediately, patients were positioned in supine, with no inclination of the operating table. The anesthesia was considered satisfactory when the sensitivity to cold was lost in the lower limbs, tested with an alcohol swab.

After the spinal anesthesia, the FNB was performed by a vascular puncture on the femoral nerve of the lower limb with an ACL injury in the G3 and G4 patients. After asepsis with an alcohol solution of chlorhexidine at 2% and placement of the surgical drapes, the needle was introduced in the midline point that joins the anterior superior iliac spine to the pubic tubercle, lateral to the pulse of the femoral artery, below of the inguinal ligament and at the height of the inguinal fold. The appropriate needle for neurostimulator (Stimuplex® A, 22G x 2", 0.7 x 50 mm, B. Braun, Melsungen, Germany) was connected to the electric neurostimulator unit (Stimuplex®, DIG RC, B. Braun, Melsungen, Germany), initially programmed with 2Hz frequency and intensity of the electric current of 1.0mA, to cause contraction of the central portion of the quadriceps muscle, proven by the elevation of the patella. Then, 100mg of bupivacaine at 0.5% was administered without vasoconstrictor, after confirming the correct position of the needle by the persistence of the contraction when reducing the stimulus between 0.6 and 0.2mA.

In the operating room, all patients received intravenously 1g of dipyrone, 100mg of ketoprofen, 1g of cefazolin and 4mg of ondansetron. Also, 5L.m^{-1} oxygen was delivered by a face mask while they remained sedated. The ACLR surgeries were performed by the same team of orthopedists. After the surgery, patients were directed to the post-anesthetic recovery room, monitored until the discharge to the ward. The removal was when they were able to move the non-operated lower limb, presented spontaneous ventilation, keeping the oxygen saturation above of 92% and stable hemodynamic parameters and were completely awaken and without pain. At that moment all patients received a printed card with the numeric pain scale (NPS) and were informed that zero would be the absence of pain and 10 the most intense pain at rest. In case the pain score was equal or superior to 4 according to the NPS, they could request the rescue analgesic at any time - that in this study was tramadol.

The prescription of analgesics in the postoperative period was standardized, and patients received 1g of dipyrone every 6 hours, 100mg of ketoprofen every 12 hours, 100mg of tramadol when requested at every 6 hours and 10mg of metoclopramide in the case of nausea or vomit.

The evaluation of the postoperative analgesia was carried with the NPS at three distinct moments: 6 (T6h), 12 (T12h) and (24 T24h) after the spinal anesthesia. At these moments, we confirmed if the patient understood the NPS and he/she was invited to choose one score without the interference of the researcher. The patient was reminded that the rescue analgesic, tramadol, could be requested to the nursing team if the NPS score became equal or superior to 4. The NPS score was recorded, and also the presence of complaints, adverse event or complication, as well as if tramadol has been requested or not. In case it had been requested, how many hours after the spinal anesthesia. All the evaluations were made by a surveyor who did not know to which group the patient belonged.

The study was approved by the Human Research Ethics Committee of the State Health Secretariat of Paraná on January 28, 2010, under number 141/2009, registered at the National Commission on Research Ethics under number FR-299803.

Statistical analysis

The data were prospectively obtained, typed in an electronic spreadsheet, checked and exported to R Core Team 2017® software and the p-value of $p>0.05$ (or 5%) indicated statistical significance. For the calculation of the sample size of the infinite population, it was used the calculation described by Arango[16]. The adopted standard deviation (σ) was the total range (TR) of pain scores (TR), that varies from zero to 10, and divided by four. Therefore, as the NPS varies between zero and 10, the calculated standard deviation was σ=TR/4, that is, (10-0)/4=2.5. The mathematical expression used to calculate the sample size was $[(z^*\sigma)/E]^2$, where z is calculated based on the normal curve (z = 1.96), E is the margin of error that was assumed of 1 point of the NPS and the adopted confidence interval was 95%. Therefore, according to the results, at least 24 patients were necessary for each group.

For the comparison of the groups regarding the demographic characteristics, the Chi-square test, Kruskal-Wallis, and the Variance Analysis with one variation source were used. The variables age, BMI, and height did not present normality according to the Shapiro-Wilk test, with normality p-value of <0.001, and due to this fact, they were analyzed with the Kruskal-Wallis test. The weight variable was considered normal by the Shapiro-Wilk test, with p=0.093.

Pain assessment in the time intervals did not present normality according to the Shapiro-Wilk test, with normality p-value of <0.001, which indicated the study of this variable by the Kruskal-Wallis test. For the evaluation of the pain scores, the Kruskal-Wallis test and the Post-Hoc of the Kruskal-Wallis test were used. Regarding the consumption of tramadol, the tests used were the Chi-square, the logistic regression (Wald test) and Kruskal-Wallis.

RESULTS

Two hundred and twenty voluntary patients were selected, and 166 could be included in the analysis as described in figure 1. No patient refused to participate in the study. However, there was exclusion related to the surgical technique, that is, during surgery the ACLR changed to other surgery, and we decided to include only the patients who underwent ACLR with flexor tendon graft, which was the initial objective of the study. The exclusion of those who received other graft was to avoid the comparison of distinct surgeries with distinct pain potential. Patients who had early hospital discharge, that is, before the 24 hours of observation, were excluded.

The demographic characteristics of the groups were similar regarding gender, weight and ASA physical state (Table 2). There was a statistical difference in age, height, and average BMI among the groups. However, since all of them were in the fourth decade of life, the average height between 1.70 and 1.77m and average BMI of 25.3 and 26.5 $kg.m^{-2}$, these data could not be physiologically evaluated. Regarding surgical characteristics, no differences were found among the groups concerning the concomitant meniscus and chondral surgery. Concomitant surgery was performed in G1 93.3%, G2 88.2%, G3 83.7% and G4 86.4% (p=0.559).

The assessment of the average scores of the intensity of pain at rest among the groups, for each time evaluation, showed a statistically significant difference at T12h and the same difference did not occur at T6h and T24h (Table 3). The difference between the scores at T12h was between G1 and G4 (p=0.01), between G2 and G3 (p=0.05) and between G2 and G4 (p<0.001).

The observation of the average pain scores in each group in the sequential evaluation at T6h, T12h and T24h showed a statistically significant pain oscillation according to Friedman's nonparametric test in G1, G2, and G3. A statistically significant difference was observed in the evaluation of pain at rest at T6h, T12h and T24h in G1, G2, and G3 with lower average pain score at T6h, increase at T12h and reduction at T24h. No statistically significant difference was found in the evaluation of pain evolution at rest in G4.

The evaluation of the need to request tramadol during the postoperative period showed a statistically significant difference (Table 4). The groups were compared in pairs with the purpose to check in which groups were the difference in the request of the analgesic and this was found in the G1 and G3 pair (p=0.007) and the G2 and G3 pair (p=0.003), and no difference was found in the other groups (Figure 2). None of the volunteer participants requested more than one dose of tramadol in the observed period. There was no statistically significant difference between the groups regarding the necessary time to request tramadol.

Table 2. Demographic characteristics

	Group 1 (n= 45)	Group 2 (n= 34)	Group 3 (n= 43)	Group 4 (n= 44)	p value
Gender					
Male	36 (80.0%)	30 (88.2%)	39 (90.7%)	32 (72.7%)	0.117(1)
Female	9 (20.0%)	4 (11.8%)	4 (9.3%)	12 (27.3%)	
Age (years)					
Median (min - max)	32 (18 - 58)	34 (18 - 47)	39 (18 - 61)	32.5 (18 - 59)	0.039(2)
Weight (kg)					
min - max	59 – 106	48-100	58 - 90	50 - 100	0.336(3)
Average ± SD	78.9 ± 14.1	75.5 ± 11.7	77.8 ± 8.9	74.7 ± 12.5	
Height (m)					
Median (min - max)	171.0 (152-189)	177 (153 - 188)	170 (164 - 185)	171.5 (152 - 185)	<0.001(2)
BMI ($kg.m^{-2}$)					
Median (min - max)	25.4 (23.4 - 36.7)	25.7 (19.9 - 31.2)	26.5 (20.5 - 29.4)	25.3 (19.5 - 32.9)	<0.001(2)
Physical state					
ASA 1	36 (80.0%)	32 (94.1%)	31 (72.1%)	36 (81.8%)	0.105(1)
ASA 2	9 (20.0%)	2 (5.9%)	12 (27.9%)	8 (18.2%)	

min = minimum; max = maximum; SD = standard deviation; BMI = body mass index; ASA 1 and 2 = physical state 1 and 2, respectively, defined by the American Society of Anesthesiologists classification. (1) the p-value for each characteristic according to the Chi-square test; (2) p-value for each characteristic according to the Kruskal-Wallis test; (3) p-value for each characteristic according to the Variance Analysis with one variation source.

Table 3. Intensity of pain at rest

	Group 1 (n= 45)	Group 2 (n= 34)	Group 3 (n= 43)	Group 4 (n= 44)	p value
T6h					
min - max	0 – 6	0 – 8	0 – 8	0 – 10	0.800(1)
Average ± SD	2.3 ± 2.0	2.7 ± 3.1	2.2 ± 3.0	2.3 ± 2.9	
T12h					
min - max	0 – 10	0 – 7	0 – 10	0 – 9	0.004(1)
Average ± SD	3.9 ± 2.6	4.5 ± 2.3	3.8 ±3.2	2.9 ± 2.3	
T24h					
min - max	0 – 6	0 – 5	0 – 5	0 – 5	0.486(1)
Average ± SD	2.6 ± 2.1	2.4 ± 1.6	2.5 ± 1.6	2.1 ± 1.4	

T6h = 6 hours after the spinal anesthesia; T12h = 12 hours after the spinal anesthesia; T24h = 24 hours after the spinal anesthesia; SD= standard deviation. At T12h, the statistical difference was found when comparing Group 1 versus Group 4 (p=0.01) and Group 2 versus Group 4 (p<0.001) according to the Post-Hoc Kruskal--Wallis test; (1) p-value for each evaluation according to the non-parametric Kruskal-Wallis test.

Table 4. Need of tramadol

	Group 1 (n= 45)	Group 2 (n= 34)	Group 3 (n= 43)	Group 4 (n= 44)	p value
Requested tramadol	21 (46.75)	18 (52.9%)	8 (18.6%)	16 (36.4%)	0.009(1)
Time to request tramadol (in hours)					
Min-Max	8 - 17.5	8.0 - 20.0	9.0 -12.0	8.0 - 20.0	p=0.248(2)
Average ± SD	11.5 ± 3.3	13.4 ± 4.2	10.5 ± 1.6	12.9 ± 4.6	

SD = standard deviation. A statistical difference was found when comparing Group 1 versus Group 3 (p=0.007)(3) and Group 2 versus Group 3 (p=0.003)(3); other groups did not present statistically significant difference according to the Logistic Regression, Wald test;(1)Chi-square test; (2) Kruskal-Wallis test.

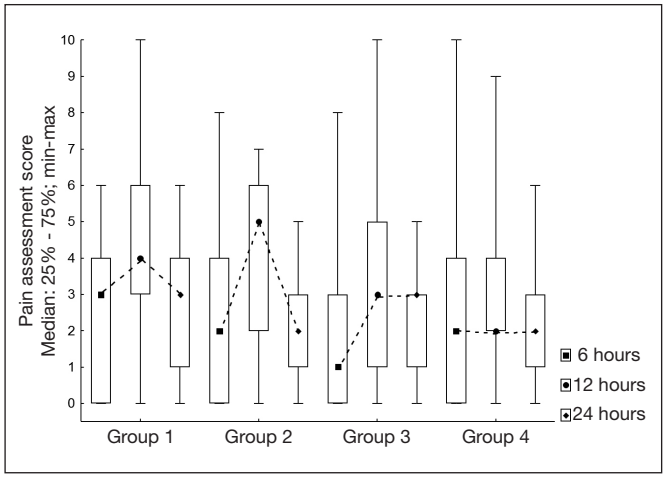

Figure 2. Pain assessment scores

DISCUSSION

Anesthetic-analgesic techniques must be personalized and adapted according to the patient's characteristics and the pain potential of the surgical procedure. At the same time, they need to prevent drug-related complications, and the techniques need to be successful in the relief of pain. When the management of the analgesia after surgery was adequate, the satisfaction with the procedure and with the medical team was higher[1-15].

In orthopedic surgeries of the lower limb, the spinal anesthesia is the most frequent technique, sometimes associated with an opioid to help to control the postoperative pain. The technique has advantages, especially in the outpatient anesthesia since it reduces the length of stay, the pain, and the need for analgesics in the postoperative period[18]. FNB of the lower limb is the most performed because it is of easy execution, demands little time to be accomplished, with low cost and prolonged analgesia[19].

In this study, although the age presented statistical difference among the groups, the average age was within the 30-year range, which does not correspond to the physiological or anatomical alterations that could compromise the studied sample. The same understanding applies to the average height between 1.70m and 1.77m and average BMI of 25.3 and 26.5 $kg.m^{-2}$. The association of meniscus and chondral surgery was frequent in this sample, as well as in other studies[20-23].

The assessment of pain at T6h was not different among the studied groups, and the control of pain was considered satisfactory in all groups in this interval. The complete regression of the spinal anesthesia with isobaric bupivacaine was not the objective of this study. However, the presence of the anesthetic in the subarachnoid space may have influenced the evaluation after six hours of the anesthesia. According to Şahin et al.[24], the time to recover from the motor blockade of the spinal anesthesia with bupivacaine at 0.5% was 293±107 minutes, and the sensitive blockade was 266±112 minutes, that is, the duration of the spinal anesthesia may have coincided with the assessment at T6h.

In the studied sample, the higher average pain scores were found at T12h. The most satisfactory analgesic performance was observed in the group that received spinal anesthesia and FNB (G4), and we can affirm that individuals of this group showed lower pain scores than those who received isolated spinal anesthesia (G1) and spinal anesthesia with fentanyl (G2). It is interesting to observe that the addition of fentanyl in the spinal anesthesia did not reduce the pain scores in this study. This study used low doses of fentanyl, and its design did not allow the assessment of sensitivity to the opioid or hyperalgesia. However, when observing these results, it is possible to assume that the studied techniques might have induced such phenomenon. Hyperalgesia is a state where the patients treated with an opioid show a reduction in the pain trigger and amplify the pain perception. Increasing the dose of the opioid, paradoxically, worsens the pain[25]. In an experimental animal model, the nerve block reduced the hyperalgesia associated to fentanyl. However, the central sensitization cannot be reverted when high doses of opioids have been administered[26,27]. The sensitization to the opioid could have led to the increase in pain perception in patients who received fentanyl in the neuroaxis[5].

At T24h, the average pain scores were similar and low, showing adequate conditions to hospital discharge in all the techniques evaluated in this study. Lower pain scores in this time interval can be attributed to the administration of other painkillers, such as dipyrone and ketoprofen in all patients at timed intervals, and to the residual effect of the FNB. The analgesic properties and duration of blockade vary according to the local anesthetic used and the delivered dose. When 200 mg of ropivacaine at 0.5% was used, the FNB provided analgesia for 13.3±2.4 hours[13]. The 62.5mg dose of bupivacaine at 0.25% provided analgesia for 23.2±7 hours while 125mg at 0.5% provided analgesia for 25.7±11 hours[12].

The stability of pain scores occurred in the postoperative period when the FNB was performed, especially when the subarachnoid fentanyl was not used. When patients did not receive FNB, as in G1 and G2, there was a peak increase in pain at T12h, and reduction in the later evaluation. In the presence of the FNB, the average scores of patients in G4 show the maintenance of mild pain in all the assessments, and G3 showed slightly higher pain scores but kept between T12h and T24h. It is possible to observe that the patients who received FNB had better stability in the control of the postoperative pain compared to the patients who did not receive it.

A study of similar methodology was described by Astur et al.[6]. However, the authors studied a total sample of only 30 patients who underwent an ACLR, and the FNB was with ropivacaine. The pain was less intense in the FNB group in the assessment at 6h after the procedure, similar at 12 and 24 hours, and became more intense on the third day, improving up to the seventh day of assessment. Curiously, even with lower pain scores most of the assessed time, patients in the FNB group consumed more analgesics, which led the authors to decide for the non-validity of the FNB.

Additionally, other blockades besides FNB can help to control the postoperative pain. In this study, we chose FNB because the innervation area is compatible with the knee and ease to implement. However, the posterior part of the knee has the sensitivity of the sciatic nerve, and there is also the possibility of participation of the obturator nerve in the medial portion of the joint. When the FNB was associated with the sciatic nerve block in ACLR, the average pain scores were lower. However, the association of blocks increased the time of the anesthetic preparation and the risk of poisoning by local anesthetics[8].

The selected drug for the analgesic rescue was tramadol. The literature shows the use of morphine [5], tramadol, morphine and acetaminophen[6], diclofenac and meperidine[10], fentanyl and meperidine[12], intramuscular diclofenac[13], among others.

With the expectation of making pain assessment less subjective in this study, we tried to evaluate the tested anesthetic techniques by means of the request of the rescue analgesic. However, this data showed a very limited validity. The criterion for the request of tramadol was the patient's perception that the pain would be moderate, that is, score equal or higher than 4, according to the NPS. Some patients had pain equal or higher than 4 and decided not to request the analgesic, despite the clear orientation to do so. During the visits, some said that *"it is normal to have pain after a surgery"* or *"I'm afraid of becoming addicted"*.

The fear of analgesics is frequent in patients, especially among those that are not regular users. The barriers to the access to analgesics are numerous. However, these drugs are crucial for pain relief. The use of opioids is lower than what is recommended in the many countries, providing insufficient analgesic treatment. On the other hand, the use of opioids without criterion and control can be risky[29,30].

Despite this bias, it is valid to say that tramadol was less requested by the patients of the group that received the spinal anesthesia with subarachnoid fentanyl associated to FNB (G3) in comparison with the G1 and G2 patients. In G2, there was a greater request for the analgesic rescue, with 52.9% of the patients requesting additional analgesia, that is, the association of the spinal anesthesia with fentanyl was related with a higher demand of the rescue analgesic.

In the G2 group, at T12h assessment, we found higher pain median that was associated with the highest percentage of rescue analgesic request. Therefore, when there was more pain, the analgesic was administered more. When tramadol was requested by the patient, the time for the request was not different among the tested groups.

Similar to the results found in this study, the literature showed a reduction in the analgesic consumption when the FNB was performed[4,10]. Souza et al.[4] found a reduction in the consumption of the rescue analgesic when the FNB was performed. The authors used morphine, and in all the evaluations, up to 24 hours after the anesthesia, the consumption of the opioid was lesser. For Wulf et al.[10], the reduction of the analgesic consumption was outstanding. Of the patients, 93% of those in the control group requested analgesic within 4 hours after the surgery, and when the FNB was indicated, the request went from 16 to 19%, varying according to the local anesthetic used. However, Astur et al.[6] did not find any difference in the analgesic consumption in the studied period.

One of the limitations found with the study methodology was the use of a scale and the subjectivity of the pain assessment with this method. Pain scales, although validated and widely used in the clinical practice and research, are subject to the subjective assessment of pain and the individual pain experience. The authors of this study adopted a cut-off point for the request of the analgesic with the expectation of minimizing the suffering and the pain ex-

perience of the volunteers. However, the adopted point may have influenced pain assessment. Another point was that the volunteers did not request the analgesic, even when they could have received the medication, saying that *"it is normal to have pain after surgery"* or *"I am afraid of becoming addicted"*.

Until the moment of data collection for this study, no evaluation protocol had been implanted in the hospital wards, what is currently an institutional need and it is expected that this study may contribute with the institution.

More studies are necessary to evaluate if other concentrations of local anesthetic would produce different results from this study regarding the analgesia and the analgesic consumption in the postoperative period.

CONCLUSION

From the analysis of the results of the present study, we concluded that the anesthetic-analgesic technique that provided lower pain scores was the spinal anesthesia with FNB, and the one that had less control of pain was the spinal anesthesia associated with fentanyl. The request of the rescue analgesic, tramadol, in the postoperative period was higher in the group that received the spinal anesthesia with fentanyl. The highest pain scores and request of tramadol rescue analgesic were reported by those who received the spinal anesthesia and fentanyl.

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