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ORIGINAL ARTICLE

Impact of peripheral nerve blocks on inflammatory response following knee arthroplasty

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Summary

Introduction: The increased inflammatory response after knee arthroplasty (TKA) is a result of bone and soft tissue trauma whose extensive reactions contribute to postoperative morbidity and mortality.

Methods: After elective TKA, 200 patients were included in this prospective cohort study. In one group of patients the adductor block and IPACK block were applied, while in the second group there were no blocks.

Results: In the group with blocks fewer patients experienced pain at rest with lower intensity (1.18±0.76 vs. 3.35±1.18 p<0.001). In the group without blocks, pain was more intense when coughing (1.7±0.52 vs. 3.72±1.61 p<0.001) and during active movements of the operated leg (1.67±0.83 vs. 3.78±1.94 p<0.001). In the first 24 hours after surgery, in the group with blocks, 22% of patients needed opioids in a dose of 9.64±3.21, while all patients in the group without blocks needed opioids in a dose of 30.94±11.47. Postoperatively, a statistically significant difference between the groups was observed in WBC, CRP, ESR, and albumin levels on the 1st, 3rd, and 5th days. Three months after TKA, the KOOS score was statistically higher in the group with blocks (92.6±11.73 vs 85.65±17.49 p<0.001).

Conclusion: The combination of nerve blocks provides adequate postoperative analgesia enabling early rehabilitation, reducing morphine consumption, reducing the count of WBC, CRP, ESR, and albumin (1st, 3rd, and 5th day postoperatively), and positively affecting the functional status three months after surgery. Identification and influence on factors that reduce the local and systemic inflammatory response is vital in improving recovery after TKA.

Keywords: knee arthroplasty, inflammatory response, nerve blocks, analgesia

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INTRODUCTION

Total knee arthroplasty (TKA) is the most common orthopedic procedure, aimed to reduce pain and improve quality of life in end-stage knee osteoarthritis (1). Systemic inflammation following major surgery is proportional to the degree of injury and it results from the activation of innate immune response. Inflammation is essential to limit exposure to harmful cellular debris and pathogens, promote healing and reflect changes in the cellular, neuroendocrine, protein, and cytokine systems (1–3). At the site of surgical injury, damage-associated molecular patterns (DAMPs) such as heat shock proteins, S100 proteins, high-mobility group protein B, nucleic acids, DNA, and adenosine triphosphate are responsible for triggering the inflammatory-immune response (4–6). They activate the cells of the innate immune system that induce the production and release of proinflammatory cytokines and chemokines (e.g. interleukin (IL)-6; tumor necrosis factor-α (TNF-α); IL-1β; IL-8; IL-12; type 1 interferons); leukotrienes (e.g. leukotriene B4); and DAMPs (e.g. high-mobility group box protein 1) promoting inflammation (4–6). Inflammation is a normal response to tissue damage, whose extensive reactions contribute to postoperative morbidity and mortality (4). The increased inflammatory response after TKA is a result of bone and soft tissue trauma (3–5).

Peripheral nerve blocks are a part of the multimodal analgesia regime after TKA. They provide adequate analgesia without muscle weakness and prevent the appearance of chronic pain (7–10). The use of peripheral nerve blocks following TKA has become more accepted for postoperative pain control, but there is no report of their effects on the inflammatory response. Surgical trauma in the postoperative period changes the level of different biomarkers of the inflammatory response. In clinical practice, the level of white blood cells (WBC), and C-reactive protein (CRP) are one of the most commonly used markers of acute inflammation(4–6).

This study aimed to determine the impact of a combination of adductor and IPACK block on inflammatory response and the appearance of complications after TKA.

MATERIALS AND METHODS

Two hundred patients underwent elective TKA at the Clinic for Orthopedic Surgery and Traumatology, University Clinical Centre of Serbia, after the Ethics Committee approval (No 340/1- July 21, 2021), and obtained written informed consent **(Figure 1)**.

This prospective cohort study includes patients aged 40-90 years, ASA I-III, with same type of implant. The patients were excluded in case of incomplete data, opioid use within 30 days before surgery, or other neurological illness that may compromise postoperative rehabilitation (drug or alcohol abuse, mental illness etc.).

TKA was performed in a bloodless field using a tourniquet in spinal or general anesthesia. Postoperatively, a combination of two peripheral nerve blocks was performed in one group of patients as part of a multimodal analgesia regime. This combination includes adductor canal block (ACB) and infiltration in the space between the popliteal artery and the capsule of the posterior knee (IPACK block), a local anesthetic for each block was 15 ml of 0.33% levobupivacaine.

ACB was performed after the identification of the sartorius muscle at midpoint of the adductor canal using the linear probe (10–12 MHz). A local anesthetic was administered laterally to the femoral artery.

The IPACK block was performed with a curved (2–5 MHz) transducer positioned, 2-3 cm above to patella over the medial thigh slightly flexed at the knee. Using the in-plane technique, the needle was inserted anteromedially into the space between the popliteal artery and the femur, followed by the injection of local anesthetic.

All patients received non-opioid analgesics (paracetamol 1 g iv. and ketorolac 30 mg iv. every eight hours alternately).

The Numerical Rating Scale (NRS) was used to measure pain intensity, at different time points in the first 24 hours postoperatively (0- no pain; 10-the worst pain imaginable). Morphine of 1 mg an intravenous bolus was given every 10 minutes if NRS was higher than three in resting or higher than five during activity or coughing. Dose of opioids in the first 24 hours postoperatively were converted into a standardized morphine milligram equivalent (MME).

Laboratory test

All parameters were tested in the same laboratory, preoperatively, on the first, third, and fifth day after surgery and included the count of white blood cells (WBC), red blood cells (RBC), hemoglobin (Hgb), hematocrit (HCT), plates (PLT), C reactive protein (CRP), erythrocyte sedimentation rate (ESR), fibrinogen and albumin.

The level of CRP was evaluated by immunoturbidimetric assay for the in vitro quantitative determination on Roche/Hitachi Cobas c systems and results are expressed as the mean in mg/L. Spectrophotometric determination of albumin was done on Roche/Hitachi Cobas c systems and expressed in g/L. All blood samples were anticoagulated by EDTA and processed in a Sysmex blood analyzer (TOA Medical Electronics, Kobe, Japan) to determine the complete blood cell counts and differential counts of leucocytes. ESR was done using ESR Analyzer Therma LINEAR modified by Westergeen and expressed in mm/h. Fibrinogen was done by Clauss on Stago Starmax and expressed in g/L.

The *Knee Injury and Osteoarthritis Outcome Score* (KOOS) was used to assess patient-relevant outcomes three months after knee surgery. KOOS includes

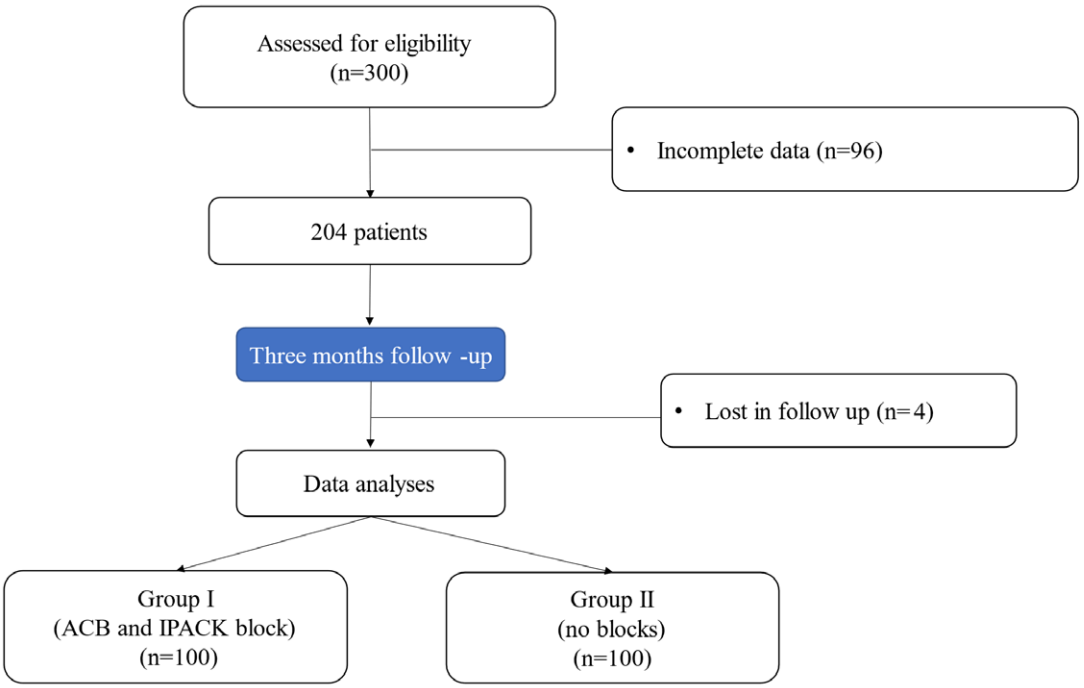

Figure 1. Patient selection and study flow

scale of *Symptoms and stiffness, Pain, Function, daily living, Function, sports, and recreational activities* and *Quality of Life*. The KOOS was expressed as the percentage of total score (0 – severe knee problems; 100 – no knee problems).

Postoperative complications included nausea, sleepiness, vomiting, itching, and drainage or swelling of the wound, deep venous thrombosis, and other complications three months postoperatively were registered.

Statistical Analysis

Statistical Analysis was performed with SPSS v28 (Statistical Package for Social Sciences, SPSS Inc, Chicago, Illinois). Data were expressed as mean ± standard deviation (SD). Normal distribution was tested using the Kolmogorov-Smirnov test. Depending on the nature of parameters, to test differences between groups the Pearson X^2 test, Fisher exact test, Kruskal Wallis test and Wilcoxon rank sum test was used. Two-tailed tests were used. Significance level was set at $p < 0.05$.

RESULTS

Three months after TKA, there were complete medical data for 200 patients (100 with blocks (ACB and IPACK block) in the first group and 100 in the second). Ninety-six patients had incomplete data, and four were lost during the three-month follow-up **(Figure 1)**.

The groups did not differ in the patient's age **(Table 1)**. There were more female patients in both groups (58% vs 62%), but with no difference between groups. In the group with blocks, 56% were ASA III, while in the group without blocks, 50% were ASA II. There was no difference between groups in BMI and the type of anesthesia. High pain intensity lasting more than three months prior to surgery was observed in 96% of patients undergoing knee surgery compared to 97% of patients overall **(Table 1)**.

Table 1. Patient characteristics

Characteristics	Blocks	No blocks	p value
Age (y)			
Mean (SD)	66.85(9.1)	70.5(6.46)	0.109
Sex - n (%)			
Male	42(42%)	38(38%)	0.665
Female	58 (58%)	62(62%)	
Weight (kg)			
Mean (SD)	81.2(12.67)	83.98(9.75)	0.194
Height (m)			
Mean (SD)	1.69(0.09)	1.7(0.09)	0.369
BMI (kg/m²)			
Mean (SD)	28.22(3.36)	28.62(2.97)	0.40
ASA physical status - n (%)			
ASA I	1 (1%)	1 (1%)	0.608
ASA II	43(43%)	50(50%)	
ASA III	56(56%)	49(49%)	
Type of anesthesia - n (%)			
General	35(35%)	30(30%)	0.545
Spinal	65(65%)	70(70%)	
In pain before surgery (during ≥3 months)			-
in the knee for surgery	96(96%)	97(97%)	0.700
in the knee & another place	4 (4%)	3(3%)	
***Pain before surgery*(NRS) – mean (SD)**	6.11(1.15)	6.33(1.15)	0.21
Total	**100(100%)**	**100(100%)**	-

BMI-body mass index; ASA- American Society of Anesthesiologists.

Table 2. Postoperative pain intensity and opioid consumption

Characteristics	In pain – n (%)			Pain (NRS) – mean (SD)		
	Blocks	No blocks	p value	Blocks	No blocks	p value
Pain after surgery, at rest						
Within 24h	82 (82)	100 (100)	**<0.001**	1.18 (0.76)	3.35 (1.18)	**<0.001**
Pain during activity						
In pain	56 (56)	100 (100)	**<0.001**	1.67 (0.83)	3.78 (1.94)	**<0.001**
Pain during coughing						
In pain	8 (8)	61 (65.48)	**<0.001**	1.7 (0.52)	3.72 (1.61)	**0.0013***
Opioids consumption						
Within 24h	22 (22)	100 (100)	**<0.001**	9.64 (3.21)	30.94 (11.47)	**<0.001**
Total	**100 (100)**	**100 (100)**	-	**100 (100)**	**100 (100)**	-

*p<0.05.

In the group receiving blocks, fewer patients experienced pain at rest, and the pain intensity was lower (1.18±0.76 vs. 3.35±1.18, p<0.001) **(Table 2)**. Also, there was a statistical difference between groups in pain when coughing (1.7±0.52 vs. 3.72±1.61 p<0.001) and during active movements of the operated leg (1.67±0.83 vs. 3.78±1.94 p<0.001) **(Table 2)**.

22% of patients needed opioids in the group with blocks in a dose of 9.64±3.21, while all patients in the group without blocks needed opioids in a dose of 30.94±11.47 **(Table 2)**.

There was no difference between groups in the number of WBC, RBC, Hgb, HCT, PLT, CRP, ESR, fibrinogen and albumin before surgery. Postoperatively, there was a statistically significant difference between the groups in WBC, CRP, ESR, and albumin levels **(Table 3, Figure 2)**.

KOOS three months after surgery, was higher in the group with blocks (92.6±11.73 vs 85.65±17.49 p<0.001) **(Table 4)**.

In the group without blocks nausea and sleepiness were more often **(Table 5)**. One patient had a foot drop, while no other postoperative complications were present in either group **(Table 5)** (11).

Table 3. Laboratory results

Laboratory test	Blocks (n=100)	No blocks (n=100)	
	$\bar{x}$(sd), med (min,max)	$\bar{x}$(sd), med (min,max)	p
before surgery			
WBC (x 10^9/L)	6.74 (1.99), 6.4 (3.7,12.8)	6.86 (1.59), 6.65 (4.2, 10.9)	0.656
RBC (x10^{12}/L)	4.49 (0.42), 4.46 (3.52, 5.63)	4.57 (0.4), 4.58 (3.65, 5.54)	0.271
HGB (g/L)	138.54 (13.9), 140 (109, 179)	138.65 (13.51), 139 (99,168)	0.956
Hct (%)	0.41 (0.04), 0.41 (0.32, 0.52)	0.41 (0.04), 0.41 (0.32, 0.49)	0.217
PLT (x10^9/L)	242.45 (60.4), 236 (117, 488)	231.99 (55.33), 235.5 (125, 393)	0.246
CRP (mg/L)	5.13 (7.06), 3 (0.3, 47.1)	6.01 (8.86), 2.4 (0.6, 65)	0.755
ESR (mm/h)	17.71 (12.07), 14 (2.3, 78)	18.71 (14.02), 14 (3.3, 80)	0.959
Fibrinogen (g/L)	3.71 (0.63), 3.62 (2.4, 5.8)	3.51 (0.86), 3.6 (1.2, 5.8)	0.142
Albumin (g/L)	40.85 (3.15), 41 (31, 47)	40.89 (2.46), 40 (34, 46)	0.719
1st day after surgery			
WBC(x 10^9/L)	8.71(2.45), 8.75 (3.6,15.6)	9.52 (2.72), 9.2 (4.8,17.8)	**0.044***
RBC (x10^{12}/L)	3.7 (0.48), 3.7 (2.62, 4.73)	3.77 (0.46), 3.76 (2.45, 4.76)	0.385
HGB (g/L)	113.7 (13.27), 113.5 (86, 152)	113.46 (13.73), 114(83, 154)	0.898
Hct (%)	0.34 (0.04), 0.33 (0.25,0.43)	0.33 (0.04), 0.33 (0.23, 0.46)	0.404
PLT (x10^9/L)	195.62 (46.93), 194 (76,324)	195.6 (49.5), 198 (99,325)	0.341
CRP(mg/L)	60.54 (30.9), 53.25 (3.6, 136.3)	76.76 (33.32), 72.75 (17.6, 171.1)	**0.001**
ESR (mm/h)	42.07 (19.84), 36 (3.5, 130)	51.6 (27.56), 45 (8,156)	**0.014***
Fibrinogen (g/L)	4.91 (0.92), 4.85 (3.4, 7.8)	4.91 (1.24), 4.75 (2.2, 8.6)	0.731
Albumin (g/L)	32.27 (3.22), 32 (26, 40)	30.87 (3.23), 31 (24, 39)	**0.005***

Laboratory test	Blocks (n=100)	No blocks (n=100)	
3rd day after surgery			
WBC (x 10⁹/L)	8.05 (2.43), 7.75 (4.2, 16.4)	8.48 (2.83), 7.95 (3.0, 17.8)	0.293
RBC (x10¹²/L)	3.41 (0.48), 3.4 (2.36, 4.51)	3.37 (0.51), 3.36 (2.27, 4.47)	0.552
HGB (g/L)	104.76 (13.83), 105 (71,139)	102.07 (15.01), 100 (75, 145)	0.233
Hct (%)	0.31 (0.04), 0.31 (0.21, 0.42)	0.30 (0.04), 0.30 (0.21, 0.43)	0.104
PLT (x10⁹/L)	215.65 (69.6), 205.5 (73, 477)	203.06 (64.04), 191 (101, 462)	0.227
CRP(mg/L)	79.69 (36.32), 73 (17.3, 250.9)	129.56 (63.61), 119.45 (12.7, 378)	**<0.001**
ESR (mm/h)	64.57 (19.91), 64.5 (10,110)	85.35 (28.84), 90 (4,176)	**0.003***
Fibrinogen (g/L)	6.0 (1.6), 6.1 (3.1, 9.0)	6.2 (1.29), 6.2 (2.4, 8.8)	0.276
Albumin (g/L)	33.39 (3.34), 33 (26,42)	31.33 (3.6), 31 (25, 40)	**<0.001**
5th day after surgery			
WBC(x 10⁹/L)	6.78 (1.79), 6.7 (3.2, 11.9)	7.74 (2.03), 7.5 (3.2, 12.6)	**0.038***
RBC(x10¹²/L)	3.37 (0.44), 3.36 (2.37, 4.4)	3.37 (0.43), 3.3 (2.64, 4.82)	0.987
HGB (g/L)	104.32 (12.85), 104.5 (80, 131)	103.23 (11.63), 102.5 (84, 138)	0.602
Hct (%)	0.31 (0.038), 0.31 (0.24, 0.39)	0.3 (0.035), 0.3 (0.25, 0.42)	0.238
PLT (x10⁹/L)	272.38 (78.9), 274 (103, 471)	269.45 (79.7), 262.5 (132, 534)	0.812
CRP(mg/L)	44.48 (35.08), 37.5 (2.3, 285)	58.59 (36.72), 49.3 (9.6, 190.3)	**0.005***
ESR (mm/h)	45.45 (22.8), 42.5 (7, 130)	67.04 (27.52), 65 (6, 116)	**<0.001**
Fibrinogen (g/L)	5.34 (1.13), 5.25 (2.6, 9.0)	5.37 (1.20), 5.35 (2.3, 8.1)	0.351
Albumin (g/L)	34.62 (3.38), 34.5 (28,44)	32.86 (3.37), 32 (27,42)	**<0.001**

WBC - white blood cells; RBC - red blood cells; Hgb - hemoglobin; Hct - hematocrit; PLT- plates; CRP- C reactive protein; ESR-erythrocyte sedimentation rate;*- p<0.05.

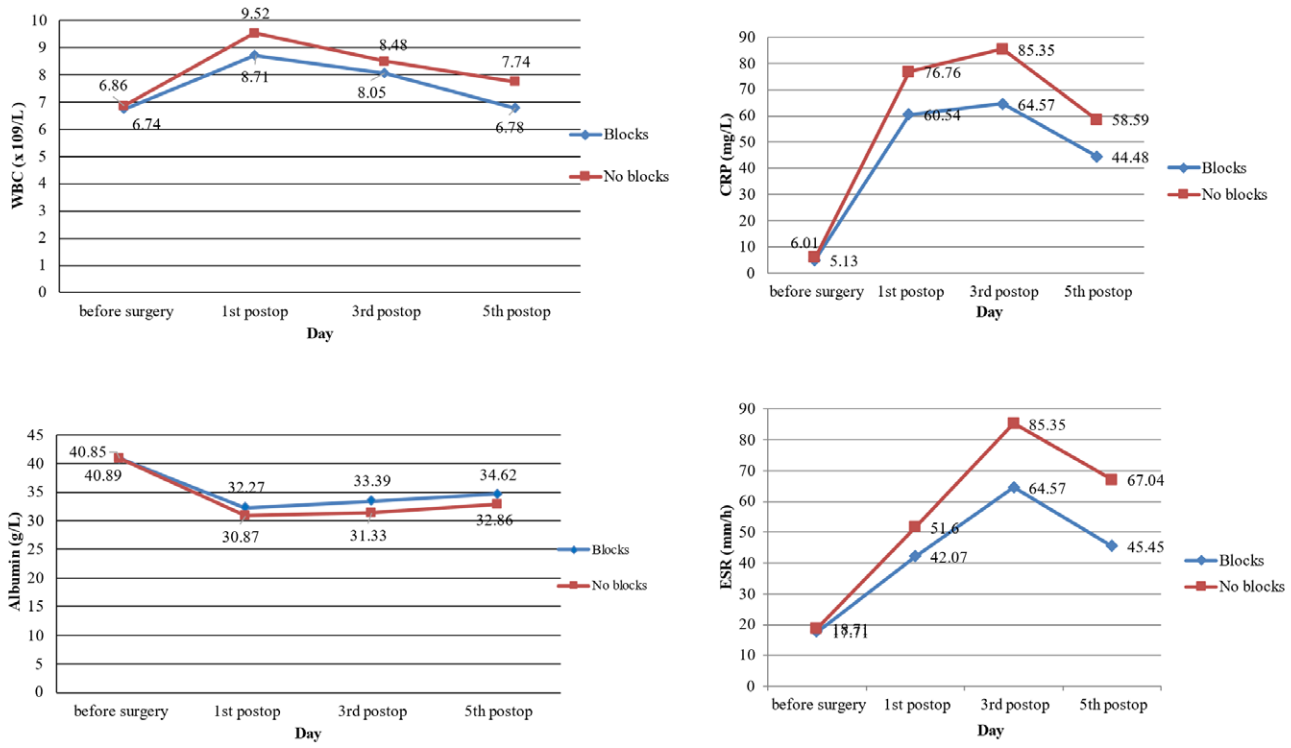

Figure 2. Laboratory results - WBC, CRP, ESR, albumin

Table 4. KOOS three months after knee arthroplasty

Characteristics	Blocks	No blocks	p value
KOOS (%)			
Mean (SD)	92.6 (11.73)	85.65 (17.49)	**<0.001**
Median (Range)	95 (40-100)	90 (25-100)	
Symptoms + Stiffness (%)			
Mean (SD)	92.07 (12.92)	88.5 (15.45)	**<0.001**
Median (Range)	98 (25-100)	94.5 (25-100)	
Pain (%)			
Mean (SD)	93.26 (11.03)	81.19 (19.93)	**<0.001**
Median (Range)	95.5 (31-100)	83 (22-100)	
Function, daily living (%)			
Mean (SD)	92.61 (12.02)	85.38 (18.65)	**<0.001**
Median (Range)	96 (35-100)	93 (25-100)	
Function, sports, and recreational activities (%)			
Mean (SD)	91.89 (12.49)	83.57 (20.16)	**<0.001**
Median (Range)	97.5 (35-100)	90 (10-100)	
Quality of life (%)			
Mean (SD)	95.8 (10.66)	89.68 (15.61)	**<0.001**
Median (Range)	100 (44-100)	97 (38-100)	
Total	**100 (100%)**	**100 (100%)**	-

Table 5. Postoperative complications

Characteristics	Blocks	No blocks	p-value
Postoperative complications			
Nausea, n (%)	0 (0%)	28(28%)	**<0.001**
Sleepiness, n (%)	4 (4%)	51(51%)	**<0.001**
Foot drop, n (%)	1 (1%)	0 (0%)	0.316
Wound drainage, n (%)	1 (1%)	1 (1%)	0.48
Urinary tract infection, n (%)	4(4%)	4(4%)	0.718
Chronic post-surgical pan, 3months after TKA			
Presence - n (%)	5 (5%)	21(21%)	**0.0016***
Pain- NRS			
Mean (SD)	3.7(0.43)	3.66(0.58)	0.19
Total, n (%)	**100 (100%)**	**100 (100%)**	-

NRS- Numerical Rating Scale; *- p<0.05*.

DISCUSSION

Osteoarthritis is the most common cause of TKA, and an inflammatory state already exists preoperatively in these patients as part of its pathophysiology (1,2). TKA as an invasive procedure is associated with stress response, which can be extensive. It comprises a neuroendocrine-metabolic reaction and an inflammatory-immune response (4,5,12). Tourniquet use contributes to this by ischemia-reperfusion injury which results in endothelial damage, increased adhesiveness, activation of leukocytes, and increased inflammatory response (4,5,13). However, stress response may vary depending on the anesthetic technique (12,14). Neuraxial anesthesia decreases neuroendocrine response to surgery by blocking all afferent neurogenic stimuli from the surgical field (12,14,15). Furthermore, anesthetic agents modulate cellular and humoral (gene expression and secretion) inflammatory responses (12,15).

Regional anesthesia, consecutive to tissue injury, modulates local and systemic response at different levels by various mechanisms (12,16). Many authors have confirmed the beneficial effect of local anesthetics in inhibiting an exaggerated inflammatory response by reduction in the metabolic activity and secretory function of leukocytes (16–18). Kim H.et al., suggested that spinal anesthesia, in contrast to general anesthesia, reduces the postoperative increase in CRP level without significant differences in other inflammatory markers (14).

However, inflammatory response after surgical trauma, serves to limit tissue damage and promote healing, by activation of polymorphonuclear neutrophil (PMN) and monocyte. Their activation leads to increasing different interleukins which induce the release of other cytokines (3,4,6). An increase in the level of IL6 correlated with post-operative complications after arthroplasty (4,19). Simultaneously, immature monocytes and granulocytes, which have anti-inflammatory effects, may create a potential window for increased susceptibility to infection

after TKA (4,16,20). Increased levels of anti-inflammatory molecules also contribute to this in post-operative period (16,21). Arthroplasty induced inhibition of T cell proliferation, with a significant reduction in CD4+ T cells (20,22). Heim C et al. confirmed increased neutrophil-to-lymphocyte ratios after TKA (23). Also, they showed that increased IL-10 enhances infectious complications in the presence of other risk factors and impaired long-term functional performance following TKA (23). However, studies have reported responses after TKA changes in leucocyte activation status (24, 25). Infection and inflammatory reactions are the most common reasons for revision knee surgery; therefore, it is essential to mitigate the intense inflammatory response following the procedure (23-25). Recently, Lutzner J. et al. compared the level of different cytokines after the implantation of a standard or hypoallergenic coated TKA. They also showed that increased inflammatory response is associated with worse functional results five years after TKA, disregarding the implant (26).

TKA aims to reduce pain and improve function. It is associated with intensive pain, especially in the first 24 hours after surgery. Stress reactions, as a consequence of bone and soft tissue trauma, increase the sensitivity of the nerves around the knee and may result in additional pain (1,7,12). Therefore, these patients are in pain more than three months before surgery as in our study group(1,2).

Peripheral nerve blocks are part of multimodal analgesia regime providing adequate analgesia without muscle weakness and preventing the appearance of chronic pain (7,8,10). Comparing to local infiltration analgesia (LIA) they provide longer analgesic duration (LIA) (10,27–29). ACB is the most popular block for preserving quadriceps strength and enhancing recovery. Its partial analgetic effects have to be combined with the technique that blocks the nerves in the posterior and lateral sides of the knee. IPACK block provides analgesia in the posterior aspect of the knee. In combination with ACB adequate analgesia is achieved in the anterior and posterior aspects of the knee without muscle weakness (30–32). Our study showed that this combination provided less pain intensity in the first 24h postoperatively and during active movements. Additionally, it reduces morphine consumption and improves KOOS value three months after surgery. This combination also reduces the count of WBC, CRP, ESR and albumin postoperatively. Martin et al., showed that nerve blocks inhibited clinical inflammation after total knee arthroplasty but did not change tissue and plasma cytokine concentrations (33).The degree of inflammation is considered as "the predicting factor" for recovery after TKA(34,35).

CONCLUSION

Peripheral nerve blocks, ACB and IPACK block, achieved adequate postoperative analgesia enabling early rehabilitation, reducing morphine consumption within 24 hours postoperatively, and positively affecting functional status three months after TKA. ACB and IPACK block reduces the count of WBC, CRP, ESR, and albumin (1st, 3^{rd,} and 5th day postoperatively). Identification and influence on factors that reduce the local and systemic inflammatory response is vital in improving recovery after TKA.

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Authors' contributions

- Study design: all authors
- Enrollment and data collection: Svetlana Srećković, Radmila Klačar, Ana Odalović, Dragana Vračević
- Data analysis and interpretation: all authors.
- First manuscript draft: Svetlana Srećković
- Revision of paper: all authors.

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UTICAJ PERIFERNIH NERVNIH BLOKOVA NA INFLAMATORNI ODGOVOR POSLE ARTROPLASTIKE KOLENA

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Sažetak

Pojačan inflamatorni odgovor nakon artroplastike kolena (TKA) rezultat je traume kosti i mekih tkiva, a njegova ekstenzivna reakcija doprinosi postoperativnom morbiditetu i mortalitetu. **Metode:** 200 pacijenata uključeno je u ovu prospektivnu kohortnu studiju nakon elektivne TKA. U prvoj grupi pacijenata primenjeni su aduktor kanal blok i IPACK blok, a u drugoj ne. **Rezultati:** Bol u mirovanju imalo je manje pacijenata u grupi sa blokom i bio je manjeg intenziteta (1,18±0,76 vs. 3,35±1,18 p<0,001). U grupi bez blokova bol je bio intenzivniji tokom kašlja (1,7±0,52 vs. 3,72±1,61 p<0,001) i pri aktivnim pokretima operisane noge (1,67±0,83 vs. 3,78±1,94 p<0,001). U prva 24 sata nakon operacije, u grupi sa blokovima, 22% pacijenata je koristilo opioide u dozi od 9,64±3,21 mg, dok su ih u grupi bez bloka svi pacijenti koristili u dozi od 30,94±11,47. Statistički značajna razlika između grupa je postojala u WBC, CRP, ESR i albuminima prvog, trećeg i petog postoperativnog dana. Tri meseca nakon TKA, KOOS skor je bio statistički viši u grupi sa blokovima (92,6±11,73 vs 85,65±17,49 p<0,001).

Zaključak: Kombinacijom nervnih blokova obezbeđuje se adekvatna postoperativna analgezija koja omogućava ranu rehabilitaciju, smanjuje potrošnju morfijuma, smanjuje broj WBC, CRP, ESR i albumina (1., 3. i 5. dan posle operacije) i pozitivno utiče na funkcionalni status tri meseca nakon operacije. Identifikacija i uticaj na faktore koji smanjuju lokalni i sistemski inflamatorni odgovor je od vitalnog značaja za poboljšanje oporavka nakon TKA.

Ključne reči: artroplastika kolena, inflamatorni odgovor, nervni blokovi, analgezija

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