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Research Article

Preoperative Treatment with Dexamethasone and Etoricoxib: A Comparison of Effects on Serum Interleukin-6 (IL-6) Levels and Postoperative Delirium (POD) in Geriatric Patients with General Anesthesia

Akbar Hasyim[1], Syafruddin Gaus[1,2]*, Nur Surya Wirawan[1,2], Andi Salahuddin[1,3], Andi Muhammad Takdir Musba[1,2], Andi Adil[1,2]

[1]Department of Anesthesiology, Intensive Care, and Pain Management, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia.

[2]Department of Anesthesiology and Intensive Care, Wahidin Sudirohusodo Central General Hospital, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia.

[3]Department of Anesthesiology and Intensive Care, Daya General Hospital, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia.

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ABSTRACT

Background: In geriatrics, general anesthesia can cause a high incidence of postoperative delirium (POD), reaching 3-61%, characterized by elevated interleukin-6 (IL-6) levels. Dexamethasone is often used as an adjunct in anesthesia to reduce cognitive impairment, but it can cause psychiatric symptoms. Cyclooxygenase-2 inhibitors such as parecoxib have been reported to inhibit post-surgical inflammation levels and improve neurological and neurocognitive disorders. However, there are no reports on the use of etoricoxib and its comparison with dexamethasone for these effects. The objective was to analyze the comparison between preoperative administration of dexamethasone and etoricoxib on IL-6 levels and POD in geriatric patients with general anesthesia.

Methods: This randomized single-blind clinical trial study included 36 geriatric patients undergoing elective surgery who received therapy under general anesthesia and were randomly divided into three groups: placebo (group P, n = 12), dexamethasone 10 mg (group D, n = 12), and etoricoxib 90 mg (group E, n = 12). IL-6 levels were measured preoperatively, 6 hours, and 24 hours postoperatively using the ELISA method. POD was measured using the Confusion Assessment Method (CAM) both preoperatively and 24 hours postoperatively.

Results: The incidence of POD at 24 hours postoperatively was significantly lower in group E compared to groups P and D ($p < 0.05$). Changes in IL-6 levels at 6 hours and 24 hours postoperatively were significantly lower in group E compared to groups P and D ($p < 0.05$). There was a significant relationship between IL-6 levels at 6 hours postoperatively and CAM ($r = 0.481$; $p < 0.05$), and there was a significant relationship between IL-6 levels at 24 hours postoperatively and CAM ($r = 0.537$; $p < 0.05$).

Conclusion: Preoperative treatment with etoricoxib was more effective in suppressing IL-6 levels and the incidence of POD than dexamethasone and placebo.

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*Corresponding author.
E-mail address: udhingaus@hotmail.com
DOI:

Introduction

Postoperative neurocognitive disorders (PND) are cognitive impairments that occur in the post-surgical period and exceed the expected time frame for recovery from the acute effects of anesthesia and surgery. PND consists of postoperative delirium (POD) and postoperative cognitive dysfunction (POCD). In POD, patients experience disturbances in consciousness, cognition, and attention that develop rapidly and fluctuate in severity. The characteristics of POD are reduced awareness and attention, occurring up to five days postoperatively after recovery from anesthesia. POD typically begins within 24 hours after surgery and resolves within 48 hours. Persistent cognitive decline that occurs days, weeks, or months after surgery is characteristic of POCD. Most studies have examined POCD occurring after 3 months post-surgery [1–4]. Cognitive changes due to anesthesia and surgery can occur in all age groups but are most common in geriatric patients [5]. PND generally ranges from 18% to 45% at three months postoperatively [3]. In geriatrics, POD reaches 3-61% [6]. Neuroinflammation is one of the etiologies of POD [3]. Interleukin-6 (IL-6) is a cytokine that enhances the inflammatory response and helps maintain homeostasis by inducing the synthesis of acute-phase proteins, such as C-reactive protein (CRP), and stimulating the acquired immune response. Mechanistically, IL-6 levels affect neurocognitive function by exacerbating neuroinflammation, regulating neurogenesis, and triggering the deposition of beta-amyloid [7]. POD has been shown to correlate with high concentrations of IL-6 in the peripheral circulation and cerebrospinal fluid [8]. Higher IL-6 levels at 6 hours post-surgery, as well as decreased hematocrit levels post-surgery, may increase the risk of POD [9]. Postoperative delirium causes decreased quality of life, increased dependency on care, increased costs of care, increased length of hospital stay, decreased functional status, development of dementia, and increased mortality [5,10]. Corticosteroids such as dexamethasone are often used as adjuncts in anesthesia to reduce cognitive impairment [11]. In a study, it was reported that preoperative intravenous low-dose dexamethasone 10 mg (2 mL) can reduce the incidence and severity of postoperative dementia [12]. However, high-dose oral glucocorticoid therapy increases the risk of psychiatric events, such as mood disorders, anxiety, aggressive behavior, insomnia, irritability, depersonalization, panic disorder, suicidal thoughts, dementia, and delirium. Several previous studies have investigated the effect of dexamethasone on the incidence of POD, but the results have been inconsistent [13]. Cyclooxygenase-2 (COX-2) inhibitors have been reported to reduce microglial activation and subsequent neuroinflammation [14]. Etoricoxib is a highly selective dipyridinyl derivative for (COX-2) [15]. In a previous study, etoricoxib effectively inhibited neuroinflammation induced by intracerebroventricular colchicine in a rat model [16]. Preoperative administration of etoricoxib also inhibits prostaglandin production in wound tissue and suppresses the increase in IL-6 in plasma undergoing hip surgery [17]. The effects of parecoxib on neurocognitive disorders in geriatric patients: the results showed that parecoxib was able to inhibit post-surgical inflammation levels and improve neurological and neurocognitive disorders [18].

Based on the results of the literature search, to date, there has been no research examining the anti-inflammatory effects of preoperative dexamethasone and etoricoxib administration on serum IL-6 levels and POD. Previous research has also not compared the use of dexamethasone and etoricoxib in postoperative IL-6 levels and POD [12,16]. This study hypothesizes that the administration of anti-inflammatory drugs in geriatric patients undergoing general anesthesia decreased serum IL-6 levels, which can prevent the occurrence of POD. Therefore, researchers are interested in analyzing the comparison between preoperative dexamethasone and etoricoxib administration in geriatric patients undergoing general anesthesia by measuring serum IL-6 levels and the incidence of POD, which are proinflammatory cytokines that play a role in the occurrence of POD.

Methods

Participants

This study employed an experimental design with a randomized, single-blind clinical trial conducted at Wahidin Sudirohusodo General Hospital, Hasanuddin University Hospital, and a teaching hospital network. The study population was geriatric patients undergoing elective surgery under general anesthesia. Inclusion criteria included age ≥65 years, ASA PS I–II, and BMI <30 kg/m². Type of surgery (ophthalmic surgery, oncologic surgery, plastic surgery, otolaryngology surgery, minimally invasive surgery, oral surgery, orthopedic surgery, or urologic surgery). And exclusion criteria included a history of neuropsychiatric disorders, use of certain medications, systemic diseases, and intraoperative complications. Subjects were explained and signed an informed consent before randomization. A total of 36 patients were included in this study and were randomly divided into three groups: placebo (group P, n = 12), dexamethasone 10 mg (group D, n = 12), and etoricoxib 90 mg (group E, n = 12).

Anesthesia

All patients were premedicated in the preoperative preparation room with ondansetron 0.1 mg/kgBW/intravenous and acetaminophen 15 mg/kgBW/intravenous. Group P was given an additional empty capsule 1 hour before surgery, and Group D was given an additional 10 mg of intravenous dexamethasone 1 hour before surgery. Group E was given an additional etoricoxib 90 mg orally 1 hour before surgery. In the operating room, premedication was performed with fentanyl 2.0-3.0 mcg/kg BW intravenously as a slow bolus. Anesthesia was induced with propofol 1.0-2.5 mg/kg BW/intravenous titration dose. Administration of atracurium 0.5-1.0 mg/kgBW/IV bolus slowly, then administration of lidocaine 1.0 mg/kgBW/IV bolus slowly before intubation of ETT or insertion of LMA. Maintenance of anesthesia with O_2 60% (O_2 100% 2 L/min + air 2 L/min) with sevoflurane inhalation anesthesia 2.0-2.5 vol% titration dose.

Intraoperative maintenance was given with fentanyl 0.5-1.0 mcg/kgBW/IV intermittently. The level of analgesia was assessed using algiscan. Postoperative pain management was given paracetamol 1 g/6 hours/IV and ibuprofen 400 mg/8 hours/IV.

Clinical data collection

Interleukin-6 (IL-6) levels were measured from venous blood samples at three time points: 1 hour preoperatively, 6 hours postoperatively, and 24 hours postoperatively, using the ELISA method. POD was measured by completing a CAM questionnaire at 1 hour preoperatively and 24 hours postoperatively. Analgesia level intraoperatively was assessed using algiscan. Pain level was estimated at 6 and 24 hours postoperatively using the Numeric Rating Scale (NRS).

Statistical analysis

Data were analyzed using SPSS 27. The normality of the data distribution was evaluated using the Shapiro–Wilk test. The results showed that the data were not normally distributed; therefore, the data were described using medians (with ranges of minimum and maximum values).

Numerical data is displayed as mean ± standard deviation (SD), tested using the ANOVA test, and categorical data is displayed with the number (n) and percentage, tested using the chi-square test. with a p-value <0.05, it is statistically significantly different.

Ethical approval statement

The study was conducted after obtaining research permission from the Research Ethics Committee of the Faculty of Medicine, Hasanuddin University, based on letter number: 118/UN4.6.4.5.31/PP36/2025.This research was conducted with the patient's consent by signing an informed consent form.

Results

This study involved 36 geriatric patients undergoing surgery under general anesthesia at Wahidin Sudirohusodo General Hospital, Makassar, who were randomly divided into three groups of 12 patients each. Subject characteristics indicated that the majority were female with a normal body mass index, ASA physical status (PS) 2, and an average surgical duration of 93 minutes.

There were no significant differences between the groups in terms of age, sex, BMI, or surgical duration, so the four groups were considered comparable for further analysis (Table 1). Interleukin-6 (IL-6) levels were measured at three time points: preoperatively, 6 hours postoperatively, and 24 hours postoperatively. The analysis revealed a significant difference in IL-6 levels between the three measurement times ($p < 0.05$), with all groups showing increased IL-6 levels at 6 hours and 24 hours postoperatively compared to preoperative values (Table 2).

The results in (Table 3) show that there was a significant difference in changes in IL-6 levels between all study groups at all study periods, with a P value <0.05. The lowest change in IL-6 levels was in group E. The result is in (Table 4).

POD incidence based on CAM 24 hours postoperatively results showed a significant difference ($p < 0.05$). The highest incidence of POD occurs in group P with 50%, followed by group D with 33% and group E with 25%. This suggests that patients in group P are at a higher risk of developing delirium after surgery compared to patients in group D and group E.

Group E has the lowest incidence of POD, indicating that patients in group E have the lowest risk of developing delirium after surgery. Therefore, group E was the most effective intervention in suppressing the risk of POD.

In (Table 5), preoperative IL-6 levels were not significantly associated with any cognitive parameters ($p > 0.05$). There was a significant association between IL-6 levels at 6 hours postoperatively and CAM ($r = 0.481$; $p < 0.05$), indicating a medium correlation between the two variables.

A positive correlation between IL-6 and incidence of POD indicated increased IL-6 levels at 6 hours postoperatively and an increasing risk of POD. There was a significant association between IL-6 levels at 24 hours postoperatively and CAM scores ($p < 0.05$), with a correlation coefficient of 0.537, categorized as a medium correlation. This positive correlation indicates that higher IL-6 levels are associated with an increased incidence of POD, although the strength of the relationship is considered medium.

In (Table 6), analysis of postoperative analgesia and pain levels in geriatric patients undergoing general anesthesia showed significant differences between groups ($p < 0.05$). Group E demonstrated better analgesic efficacy, with less severe pain at 6 and 24 hours postoperatively, compared to groups P and D, which had a lower analgesic range and higher pain levels.

Table 1- Characteristics of research subjects

Karakteristik	Group P (n=12)	Group D (n=12)	Group E (n=12)	P value
Age (years)[a]	66 (65-80)	66 (59-73)	65 (65-72)	0.502[ns]
Gender[b]				
Male	5 (41.7)	4 (33.3)	6 (50.0)	0.169[ns]
Female	7 (58.3)	8 (66.7)	6 (50.0)	
BMI[c]	21.75 ± 3.74	21.50 ± 2.86	24.15 ± 3.12	0.667[ns]
ASA PS				
I	0 (0)	0 (0)	0 (0)	N/A
II	12 (100)	12 (100)	12 (100)	
Operation time (minutes)[a]	102.5 (70-150)	90 (50-150)	92.5 (60.150)	0.910[ns]

[a] Numerical data is displayed as mean ± standard deviation (SD), tested using the ANOVA test; [b] Categorical data is displayed with the number (n) and percentage (%), tested using the Chi-square test.; [c] Numerical data are displayed as mean ± standard deviation (SD), tested using the ANOVA test. N/A = None. ns: not statistically significantly different, ASA PS: American Society of Anesthesiologists Physical Status Classification, BMI: Body Mass Index.

Table 2- Comparison of IL-6 levels between preoperative and postoperative

IL-6 levels (pg/mL)	Preoperative (T0)	6 hours post-surgery (T1)	24hours post-surgery (T2)	P value
	Median (min-max)	Median (min-max)	Median (min-max)	
Group P	51.05 (42.20-92.75)	58.19 (30.94-182.70)	60.15 (39.87-192.70)	< 0.001*
Group D	55.74 (39.32-84.55)	62.86 (47.12-104.62)	63.02 (34.25-154.56)	< 0.001*
Group E	41.27 (32.33-170.45)	44.00 (33.89-233.62)	48.85 (39.15-253.77)	< 0.001*

Data are displayed with median (minimum value-maximum value), tested using Friedman's test. *: P value <0.05 is statistically significantly different.

Table 3- Comparison of changes in IL-6 levels across all study groups

Measurement time interval	Delta IL-6 levels (pg/mL)			P value
	Group P (n=12)	Group D (n=12)	Group E (n=12)	
	Median (min-max)	Median (min-max)	Median (min-max)	
T0-T1	16.68 (1.40-109.05)	16.27 (3.34-59.80)	10.35 (-3.24-63.17)	0.026*
T1-T2	7.24 (1.82-28.93)	3.39 (-18.42-49.94)	3.41 (0.63-16.77)	0.033*
T0-T2	28.20 (4.15-119.05)	19.19 (-5.45-109.74)	19.14 (4.98-64.31)	0.032*

Data are displayed as median (minimum value-maximum value), and the results are tested using the Kruskal-Wallis test. *: P value <0.05 is statistically significantly different.

Table 4- Comparison of POD outcomes between all study groups

POD	Group P (n=12)	Group D (n=12)	Group E (n=12)	P value
	n (%)	n (%)	n (%)	
Delirium	6 (50.0)	4 (33.3)	3 (25.0)	0.048*
No delirium	6 (50.0)	8 (66.7)	9 (75.0)	

Data are displayed as the number (n) and percentage (%), and tested using the Chi-square test. *: P value <0.05 is statistically significantly different; CAM: Confusion Assessment Method.

Table 5- Relationship between IL-6 levels and POD

IL-6 levels	Delirium	
	r	P value
Pre-operative	0.230	0.116[ns]
6 hours postoperative	0.481	<0.001*
24 hours postoperative	0.537	<0.001*

Spearman correlation test, r= 0.00-0.20 (very weak); r= 0.20-0.39 (weak); r= 0.40-0.59 (moderate); r= 0.60-0.79 (strong); r= 0.80-1.00 (very strong). *: P value <0.05 is statistically significantly different. ns: not statistically significantly different. CAM: Confusion Assessment Method.

Table 6- Level of analgesia and postoperative pain level in geriatric patients

Level of analgesia	Group P (n=12)	Group D (n=12)	Group E (n=12)	P value
	Median (min-max)	Median (min-max)	Median (min-max)	
Intraoperative PPI	3.5 (3.0-5.0)	3.0 (2.0-4.0)	1.0 (1.0-2.0)	< 0.001*
NRS 6 hours postoperatively	4.5 (3.0-6.0)	4.0 (3.0-6.0)	0.0 (0.0-1.0)	< 0.001*
NRS 24 hours postoperatively	2.0 (1.0-3.0)	2.5 (2.0-4.0)	1.0 (1.0-2.0)	< 0.001*

Data are displayed as median (minimum value-maximum value), and the results are tested using the Kruskal-Wallis test. *: P value <0.05 is statistically significant. PPI: Pupillary pain index, NRS: Numeric Rating Scale.

Discussion

Characteristics of patients

This study was conducted on 36 geriatric patients undergoing general anesthesia at Wahidin Sudirohusodo General Hospital, Makassar. The study was randomly divided into three groups, where 12 patients received empty capsules before surgery as a control, 12 patients received dexamethasone 10 mg before surgery, and 12 patients received etoricoxib 90 mg before surgery. The three groups of study subjects had homogeneous characteristics in terms of age, gender, BMI, and duration of surgery, making them suitable for comparison.

Comparison of the effects of preoperative treatment of etoricoxib and dexamethasone on IL-6 levels

The results of this study showed an increase in IL-6 levels at 6 hours post-surgery, which continued to rise at 24 hours post-surgery in all study groups. This result is consistent with the study, which found that serum IL-6 levels increased post-surgery, with a maximum increase observed within the first 24 hours post-surgery, particularly in geriatric patients aged over 60 years [19]. Similar results were reported in the study where plasma IL-6 levels increased immediately after surgery and reached peak values at 24 hours post-surgery and gradually decreased in cardiac surgery patients [20].

Postoperative increases in IL-6 levels are due to surgical trauma, causing peripheral inflammation. Injured cells release damage-associated molecular patterns (DAMPs), such as high-mobility group box protein-1 (HMGB1), in response to surgical trauma. HMGB1 activates the nuclear factor-kappa B (NF-κB) signaling pathway in bone marrow-derived monocytes (BMDMs), leading to nuclear translocation of NF-κB, increased expression of COX-2 isozymes, and expression of pro-inflammatory cytokines such as IL-6 [21].

In this study, patients receiving preoperative etoricoxib experienced a lower increase in postoperative IL-6 levels than patients receiving preoperative dexamethasone or placebo. Research related to the effect of preoperative etoricoxib use on postoperative IL-6 levels has been conducted, yielding results similar to those of this study. The study found that patients receiving 120 mg of etoricoxib 2 hours preoperatively and 24 hours postoperatively can reduce IL-6 and pain levels in those undergoing hip replacement. In the 90 mg etoricoxib group, IL-6 levels returned to preoperative levels within 20 hours after surgery. Research on the use of preoperative etoricoxib and its impact on postoperative IL-6 levels remains limited. Other studies have reported the effect of etoricoxib on IL-6 levels in non-surgical patients with similar results to this study. This result is consistent with that reported by those who examined the impact of etoricoxib therapy on IL-6 levels in serum and synovial fluid in patients with inflammatory arthritis. The results showed that etoricoxib therapy, administered at 90 mg once daily, significantly reduced IL-6 levels in synovial fluid [22]. Thus, the results of this study support those of two previous studies, which indicate that etoricoxib produces anti-inflammatory effects by reducing IL-6 levels.

The mechanism of etoricoxib's effect in reducing IL-6 levels is related to its COX-2 inhibitory action because IL-6 release is associated with increased COX-2 expression, which in turn leads to the production of PGE2. PGE2 and thromboxane 2, which are members of the autacoid family, act as autacoids to activate their respective receptors, which induce IL-6 secretion [23]. Thus, inhibition of COX-2 expression reduces PGE2 production, thereby reducing IL-6 release. This study supports previous findings that preoperative etoricoxib produces anti-inflammatory effects that can reduce IL-6 levels.

In this study, high IL-6 levels at 6 and 24 hours postoperatively were associated with POD. These results suggest that IL-6 levels at 6 and 24 hours postoperatively may be potential predictors and indicators of neurocognitive impairment at 24 hours. These results are in line with the study that found that patients with IL-6 levels ≥ 830.50 pg/mL at 6 hours postoperatively had a fivefold increased risk of postoperative neurocognitive impairment compared to patients with IL-6 levels < 830.50 pg/mL in patients with coronary artery bypass grafting (CABG) [24]. Similar results were reported, which found that patients with neurocognitive impairment at 1-day post-surgery had significantly higher serum IL-6 levels at 6 hours post-surgery (135.32 pg/mL) compared to patients without post-surgical neurocognitive impairment (91.29 pg/mL) in geriatric patients undergoing total hip replacement surgery [25].

The results of this study indicate that high levels of IL-6 at 6 and 24 hours postoperatively are associated with the incidence of POD. These results imply that IL-6 levels at 6 and 24 hours postoperatively could be used as predictors of POD. These results align with the study, which found that plasma IL-6 levels were significantly higher in patients with POD compared to those without POD at two time points: 24 hours postoperatively and 48 hours postoperatively [20]. A meta-analysis stated that in the early postoperative period, serum IL-6 levels were significantly higher in delirious patients compared to non-delirious patients, indicating that early serum inflammatory variables tend to be predictors of POD [26]. In a study, it was stated that patients experiencing POD showed significantly higher IL-6 levels 48 hours after cardiac surgery [2]. In this study, IL-6 levels were only monitored for up to 24 hours and were not continued until 48 hours post-surgery.

The mechanism of the relationship between IL-6 levels and POD can be explained as follows. Injuries from surgical trauma and anesthesia cause a peripheral inflammatory response, one of which is increased IL-6 levels. Peripheral inflammation also disrupts the blood-brain barrier (BBB) permeability and microglia [27]. IL-6 produced crosses the BBB and enters the CNS, activating central inflammatory cells. Inflammatory cells continuously release a series of pathological proteins, including inflammatory cytokines, toxic proteins, and neurotoxins, which can interact with neurons and synapses, leading to neuronal death, synaptic loss, and impaired cell signaling, ultimately resulting in postoperative neurocognitive impairment. Specifically, IL-6 derived from lymphocytes can inhibit the metabolism and accumulation of excessive glutamate. GABA receptors are downregulated to inhibit inhibitory neurotransmission, which can disrupt the balance between excitatory and inhibitory neurotransmission, thereby reducing neuronal excitability and synaptic activity and ultimately leading to postoperative neurocognitive impairment [28].

Comparison of the effects of preoperative treatment with etoricoxib and dexamethasone on postoperative delirium

The results of this study indicate that preoperative treatment with etoricoxib can suppress the incidence of POD compared to preoperative treatment with dexamethasone and placebo. Thus, etoricoxib has an effect in lowering POD. Research related to the impact of preoperative etoricoxib administration on POD has never been conducted before; however, previous research has examined the impact of etoricoxib administration on neurocognitive disorders of dementia. This result is as reported by those who studied the relationship between etoricoxib use and the incidence of dementia in osteoarthritis patients. Etoricoxib was stated to reduce the incidence of dementia in osteoarthritis patients [29]. About its effect on improving POD, etoricoxib works by selectively inhibiting the COX-2 enzyme [30]. COX-2 is expressed in the brain and plays a role in the development of neuroinflammation by catalyzing the conversion of arachidonic acid to proinflammatory prostaglandins, which leads to increased BBB permeability. Increased BBB permeability leads to increased brain inflammation by facilitating the influx of inflammatory factors into the brain. Therefore, COX-2 inhibitors can reduce neuroinflammation and potentially reduce the incidence of postoperative neurocognitive impairment [28]. This study also reported that patients receiving etoricoxib experienced adequate analgesia and mild pain relief at both 6 and 24 hours postoperatively. In contrast, patients receiving dexamethasone or placebo experienced moderate and inadequate analgesia, respectively, with moderate pain relief. This result suggests that etoricoxib acts as an analgesic. These results, as reported, indicate that etoricoxib's role in reducing neurocognitive impairment is not only related to etoricoxib's anti-inflammatory effects but also its analgesic effects [31]. This result is as reported in a meta-analysis study, which states that postoperative pain intensity is related to the incidence and risk of POD [32]. The results of this study are supported by research that suggests that adequate intraoperative analgesia can reduce the incidence of POD in elderly patients aged over 65 years who are scheduled to undergo unilateral total knee arthroplasty [33].

The role of etoricoxib as an analgesic has been demonstrated in various studies. A study found that preoperative administration of 120 mg of etoricoxib reduced pain scores 3 and 7 days after the extraction of impacted mandibular third molars [34]. In a study, it was reported that a single preoperative dose of 120 mg etoricoxib reduced the level of pain intensity at rest 24 hours after knee arthroscopic surgery [35]. The study reported that a single preoperative oral dose of 120 mg etoricoxib, given one hour preoperatively, significantly reduced postoperative pain at rest and movement at 24 hours postoperatively in patients undergoing single-level discectomy [36]. The mechanism of the relationship between pain and POD has been explained in terms of the level of inflammation. Adequate analgesia can block the upward transmission of various pain stimuli in the spinal cord and reduce the central inflammatory reaction [37]. Thus, the results of this study support the evidence for the use of preoperative etoricoxib in reducing POD.

The limitation of the study

This study is the first to compare the preoperative treatment of dexamethasone and etoricoxib on the effects of IL-6 levels and POD, a significant advantage. A limitation is that IL-6 levels were only monitored for up to 24 hours postoperatively.

Conclusion

Based on the study results, preoperative treatment with a single dose of etoricoxib was proven to be more effective in suppressing serum IL-6 levels and the incidence of POD compared to dexamethasone treatment in geriatric patients undergoing general anesthesia. Therefore, monitoring postoperative IL-6 levels may be a potential indicator for early detection and intervention of POD, particularly with a therapeutic approach using etoricoxib. Future studies are recommended to evaluate IL-6 levels longitudinally by adding additional postoperative measurement time points to more comprehensively understand the dynamics of the inflammatory response.

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Author Contributions

AH: data collection, methodology development, and drafting of the manuscript, SG: conceptualization, design of the study, critical revisions to the manuscript NSW: critical revisions to the manuscript, AS: data analysis and interpretation AMTM: critical revisions to the manuscript, AA: critical revisions to the manuscript. All authors contributed to the drafting of the manuscript and approved the final version.

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