

## Introduction

- Chronic post- total knee arthroplasty (TKA) pain, the prevalence of which is reported up to 47%, is associated with inadequate acute postoperative pain management.
- Dexmedetomidine is a sedative-analgesic agent acting as an  $\alpha_2$ -adrenergic receptor agonist, and its analgesic effect has been shown in various procedures or surgeries.
- In the present study, We compared the adjuvant analgesic role of propofol and dexmedetomidine when they were used for intraoperative sedation during TKA under spinal anesthesia.

## Materials & Methods

- Ethical approval was provided by the Institutional Review Board of Seoul National University Bundang Hospital (reference number: B-1603/339-005).
- The dexmedetomidine group (n = 24) received 1  $\mu\text{g kg}^{-1}$  dexmedetomidine for 10 min followed by a continuous infusion at 0.1–0.5  $\mu\text{g kg}^{-1} \text{h}^{-1}$ .
- Propofol was infused to the propofol group (n = 24) continuously via a target-controlled infusion device, and the effect-site concentration was maintained with a range of 0.5–2.0  $\mu\text{g ml}^{-1}$ .
- Numerical rating scale (NRS) for pain at rest, the cumulative amounts of fentanyl administered via intravenous patient-controlled analgesia (IV PCA), rescue analgesics, and antiemetics were compared between the two groups during the postoperative 24 h and 48 h.

- Systolic blood pressure and heart rate (HR) were recorded from the initiation of sedation until PACU discharge.

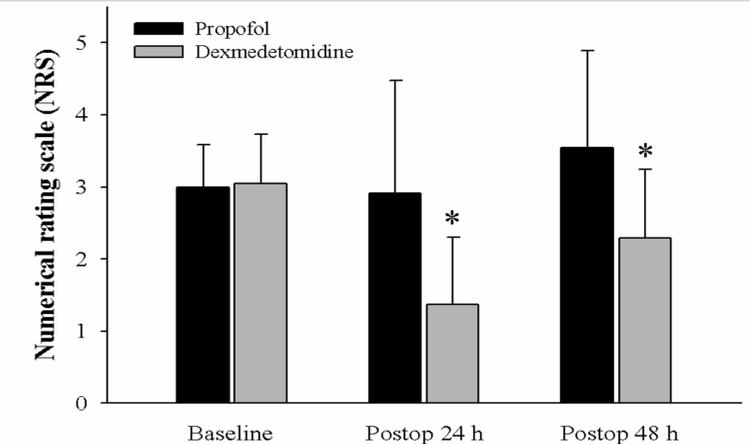
## Results

- Dexmedetomidine significantly reduced the consumption of fentanyl during the postoperative 24 h and 48 h (Table 1).
- NRS was lower at postoperative 24 h [1.48 (0.9) vs. 2.9 (1.6),  $P < 0.001$ ] and 48 h [2.3 (0.9) vs. 3.5 (1.4),  $P = 0.001$ ] in the dexmedetomidine group than in the propofol group (Figure 1).
- There were no significant differences in the amount of antiemetics and rescue analgesics between the two groups (Table 1).
- On average, HR was 4 beats/min faster in the propofol group than in the dexmedetomidine group ( $P < 0.001$ ) and significantly lower during initial 60 min of sedation period in each group ( $P < 0.001$ ) (Figure 2).

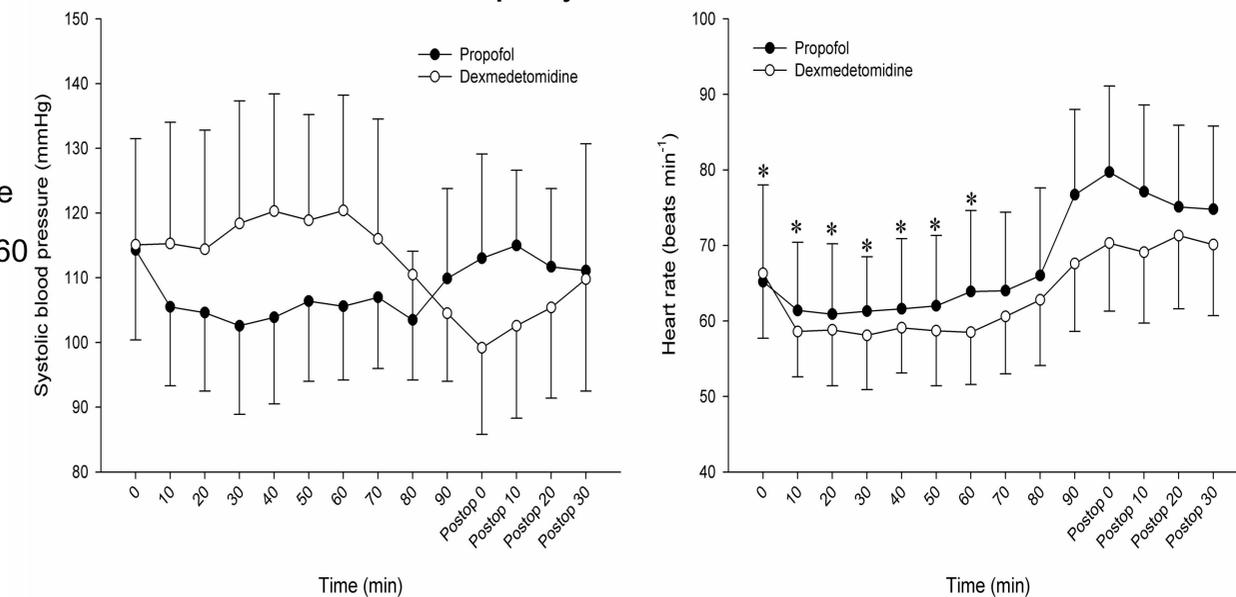
	Propofol (n = 24)	Dexmedetomidine (n = 24)	P
Postoperative 24 h			
PCA consumption ( $\mu\text{g}$ )	177.5 (164.9)	64.4 (64.0)	0.003
Ketoprofen (mg)	20.8 (50.9)	4.2 (4.3)	0.143
Ketoprofen (n)	4 (16.7%)	1 (4.2%)	0.348
Metoclopramide (mg)	2.5 (4.4)	1.7 (3.8)	0.488
Metoclopramide (n)	6 (25.0%)	4 (16.7%)	0.724
Postoperative 48 h			
PCA consumption ( $\mu\text{g}$ )	393.8 (333.6)	151.3 (112.5)	0.002
Ketoprofen (mg)	41.7 (71.7)	12.5 (33.8)	0.078
Ketoprofen (n)	8 (33.3%)	3 (12.5%)	0.168
Metoclopramide (mg)	0.8 (2.8)	0.0 (0.0)	0.155
Metoclopramide (n)	2 (8.3%)	0 (0.0%)	0.489

Data are expressed as mean (SD) or numbers (proportion)

**Table 1. Postoperative PCA consumption, rescue analgesics, and antiemetics.**



**Figure 1. Numerical rating scales for postoperative pain at 24 and 48 h after total knee arthroplasty.**



**Figure 2. Changes in systolic blood pressure and heart rate during sedation and postoperative 30 min.**

## Conclusions

- Intraoperative dexmedetomidine sedation was more efficacious to relieve acute postoperative pain after TKA with less use of opioid compared to the propofol sedation.