Correspondence

Reply: Using epinephrine in local infiltration analgesia (LIA): focusing on safety reasons

(Reply to Fernando R Altermatt and Juan C De la Cuadra-Fontaine. Acta Orthop 2023; 94: 287 regarding Chareancholvanich et al., Acta Orthop 2023; 94: 97–101. doi: 10.2340/17453674.2023.8482)

Sir,—we are pleased to know that you were interested in our study "Efficacy of epinephrine in local infiltration analgesia on pain relief and opioid consumption following total knee arthroplasty: a randomized controlled trial." We thank you for your comments regarding concerns regarding the toxicity of bupivacaine and for providing us with such useful information.

We were also aware of the risk of developing local anesthetic systemic toxicity (LAST) after local infiltration analgesia (LIA) solution, bupivacaine in particular. As you mentioned, to date, no study has evaluated bupivacaine absorption used in LIA for TKA. However, there are many published recommendations concerning the optimal dose of bupivacaine, both in dose per weight and maximum dose. According to El-Boghdadly et al., the maximum dose of bupivacaine without epinephrine is 2 mg/kg or 175 mg, while the maximum dose of bupivacaine with epinephrine is 3 mg/kg or 225 mg (1). Another source stated that 2.5–3.5 mg/kg is an upper limit of dosing (2). Our local infiltration analgesia was composed of 0.5% bupivacaine 20 mL, which equaled 100 mg in total. The average weight of the control group was 63 kg, and the average weight of the epinephrine group was 70 kg. Therefore, the bupivacaine prescribed in our study was well below the maximum dose recommendation. The dose of bupivacaine in LIA used in our study was also less than in some other studies. Hagar et al. injected bupivacaine at a dose ranging from 125 mg to 250 mg in their studies (3). Moreover, amounts as high as 300 mg of bupivacaine have also been reported in a study from Peterson et al. without any occurrence of LAST (4).

Ultimately, we do not deny that adding epinephrine into the LIA regimen would increase the safety dose of bupivacaine, but whether that will be necessary or not may still need to be debated.

Chaturong Pornrattanamaneewong
Department of Orthopaedic Surgery, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand
Correspondence: toonchaturong@gmail.com

1. **El-Boghdadly K, Pawa A, Chin K J.** Local anesthetic systemic toxicity: current perspectives. Local Reg Anesth 2018; 11: 35-44. doi: 10.2147/LRA.S154512.
2. **Shafiei F T, McAllister R K, Lopez J.** Bupivacaine. StatPearls. Treasure Island, FL: StatPearls Publishing LLC; 2023.
3. **Hagar A D, Fang C J, Dannenbaum J H, Smith E L, Bono J V, Talmo C T.** Reducing narcotic usage with 0.5% bupivacaine periarticular injections in total knee arthroplasty. J Arthroplasty 2022; 37(5): 851-6. doi: 10.1016/j.arth.2022.01.026.
4. **Peterson J R, Steele J R, Wellman S S, Lachiewicz P F.** Surgeon-performed high-dose bupivacaine periarticular injection with intra-articular saphenous nerve block is not inferior to adductor canal block in total knee arthroplasty. J Arthroplasty 2020; 35(5): 1233-8. doi: 10.1016/j.arth.2020.01.030.

DOI 10.2340/17453674.2023.13647