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LETTER

General/Surgery/Internal

The strong rationale for the use of dexmedetomidine instead of fentanyl as adjuvant to ropivacaine for epidural anaesthesia

Dear Editor,

We congratulate Quian et al[1] for conducting a very interesting meta-analysis on the clinical value of dexmedetomidine as adjuvant to ropivacaine for epidural anaesthesia. The authors compared dexmedetomidine to fentanyl, which is probably the most commonly used adjuvant in epidural anaesthesia and analgesia.[2]

This well-conducted meta-analysis of randomised controlled trials (RCTs) included data on 672 patients and showed significant benefits of dexmedetomidine with earlier onset of sensory block (SB; mean difference, MD −2.82 minutes) and motor block (MMB, MD −4.35 minutes), as well as a longer time to rescue analgesia (MD: 99.13 minutes). The authors concludes that dexmedetomidine is better than fentanyl as adjuvant to ropivacaine for epidural anaesthesia.[1]

In consideration of the risk of bias in the included RCTs, we think that a trial sequential analysis (TSA) on the primary outcomes is warranted before drawing strong conclusions in support of dexmedetomidine. Indeed, adding TSAs would help to understand the robustness of the findings and to exclude the risks of type I statistical error, providing results on the required "information size" (sample of patients needed) for the investigated outcomes. We imported outcomes data in the TSA Software (Copenhagen Trial Unit's TSA Software®; Copenhagen, Denmark). The information size was computed assuming an alpha risk of 5% with a power of 80%. We used a random effect model, and as estimated effects on the investigated outcomes we used the MD reported by Quian et al Further details on TSA and its interpretation are available elsewhere.[3]

Therefore, we conducted three TSAs in total to investigate the robustness of superiority of dexmedetomidine as compared to fentanyl for epidural anaesthesia regarding onset of SB and MMB, as well as longer time before rescue analgesia. The TSAs showed that the required information size (or sample size needed) was already reached for two outcomes (time to MMB and to rescue analgesia), and approached for the SB (572 recruited – 623 needed).

Importantly, all the TSAs confirmed the robustness of the findings of Quian et al[1] as the Z-curve of effect crossed the adjusted significance thresholds in all analyses. In particular, the Z-curve crossed the adjusted significance thresholds both for time to SB and MB (Figure 1A,B). Regarding the time to rescue analgesia, as the effect size estimated by Quian et al was particularly large, we performed another sensitivity TSA assuming half of the reported effect size (49.56 minutes). Even such sensitivity analysis showed robustness of the meta-analysis findings (Figure 2).

In summary, the authors conducted a scrupulous meta-analysis,[1] but it is important to perform TSAs to confirm the robustness of the

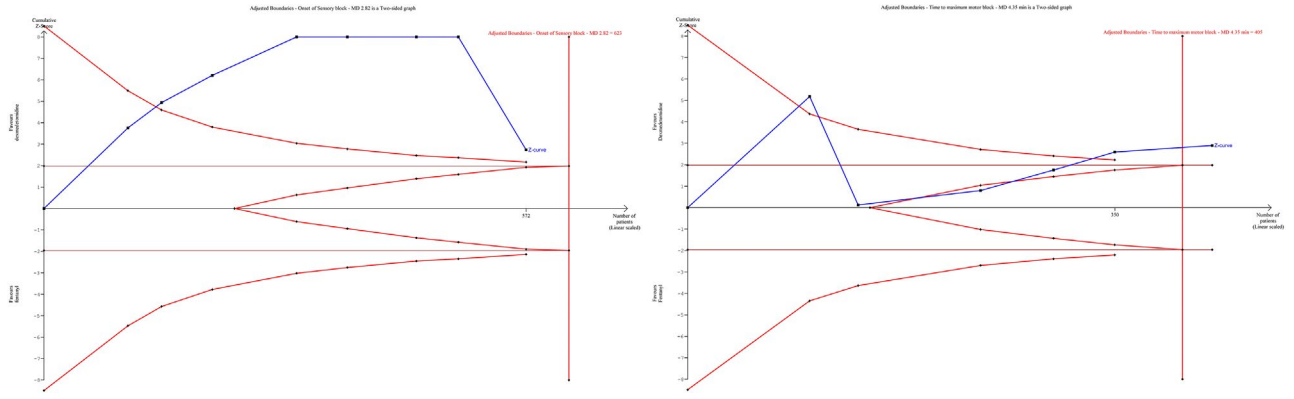

FIGURE 1 Trial sequential analysis (TSA). 1a TSA on time to onset of sensory block. 1b: time to onset of maximum motor block

Letter to Editor on the recently published article: Dexmedetomidine vs fentanyl as adjuvants to ropivacaine for epidural anaesthesia: A systematic review and meta-analysis. Qian MJ et al. Int J Clin Pract 2021 May;75(5):e13772. doi: 10.1111/ijcp.13772. Epub 2020 Dec 20.

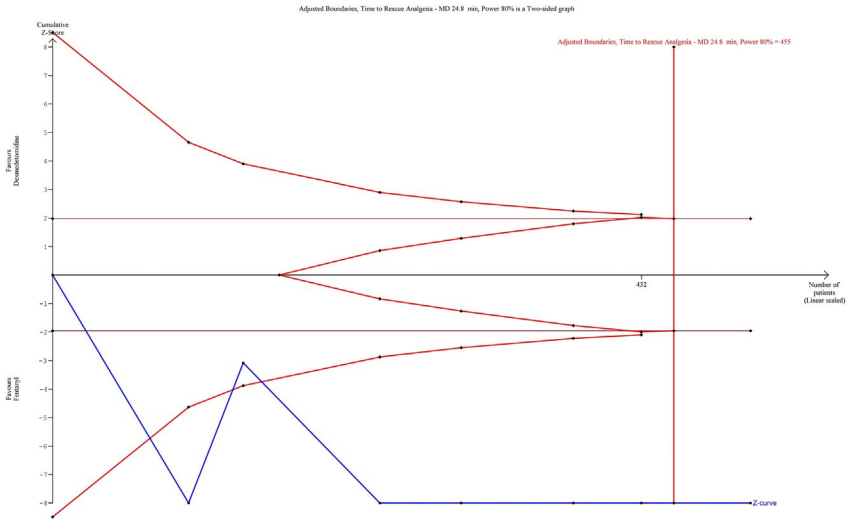

FIGURE 2 Trial sequential analysis (TSA) on time to rescue analgesia

investigated outcomes and to support the use of dexmedetomidine as adjuvant to ropivacaine in patients receiving epidural anaesthesia.

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