Systemic Dexmedetomidine is not as Efficient as Perineural Dexmedetomidine in Prolonging an Ulnar Nerve Block

A Randomised, Triple-masked, Controlled Non-inferiority Trial in Healthy Volunteers

Jakob H. Andersen, MD, Pia Jæger, MD, PhD, Ulrik Grevstad, MD, PhD, Stine Estrup, MD, Anja Geisler, CCRN, Frederik Vilhelmsen, MD, Jorgen B. Dahl, M.D., DMSc, M.B.Aex, Gunnar H. Laier, PhD, Brian M Ilfeld, MD, MS, Ole Mathiesen, MD, PhD

1 Aim

To test if both perineural and systemic dexmedetomidine prolong the duration of an ulnar nerve block (UNB) compared with ropivacaine alone, and if systemic dexmedetomidine is non-inferior compared with perineural dexmedetomidine in block prolongation

3 Results

Mean sensory block duration was longer in both the Perineural (14.4 h, 95% CI 13.1 to 15.6) and Systemic treatments (9.2 h, 95% CI 8.6 to 9.8) compared with the NoDex treatment (7.1 h, 95% CI 6.6 to 7.6) ($P < 0.0001$ for both). Systemic dexmedetomidine was inferior (not non-inferior) compared with perineural dexmedetomidine.

4 Duration of block

2 Methods

- Simultaneous bilateral Ulnar nerve blocks in 22 healthy volunteers
- Two separate trial days with randomisation of arms

Day 1

Perineural Dexmedetomidine
4ml ropivacaine 0.5% + 100µg dexmedetomidine (perineurally)

Systemic Dexmedetomidine
4ml ropivacaine 0.5% + saline (systemic effect of Dex from opposite arm)

Day 2

NoDex treatment
4ml ropivacaine 0.5% + saline

HiRopi treatment
4ml ropivacaine 0.75% + saline

5 Non-Inferiority

Favors Systemic Dex Favors Perineural Dex

Difference in duration of sensory nerve block between Perineural and Systemic Dex treatments (Mean (95% CI) /h.

6 Conclusion

Perineural dexmedetomidine doubles the duration of an UNB. Systemic dexmedetomidine also prolongs the duration of UNB, but has significantly less effect compared with a perineural administration.