Does dexmedetomidine have a perineural mechanism of action, when used as an adjuvant to ropivacaine?

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Take Home Messages

- Dexmedetomidine has a perineural mechanism of action when used as an adjuvant to ropivacaine
- Dexmedetomidine prolongs the duration of an adductor canal block by 2.1h

Introduction

Dexmedetomidine used as an adjuvant to local anesthetics prolongs the duration of peripheral nerve blocks. Whether this is mediated by systemic- or perineural effects is unknown. We aim to determine whether dexmedetomidine has a peripheral mechanism of action when controlling for possible systemic effects.

Materials and methods

- Randomized, paired trial in healthy volunteers.
- 21 participants received bilateral adductor canal blocks
- 20 ml ropivacaine 0.5% + 100 µg dexmedetomidine in one thigh and 20 ml ropivacaine 0.5% + 1 ml saline in the other thigh.
- The paired design ensures that any difference in the duration of the two nerveblocks is attributable to a peripheral effect
- Primary outcome:** Duration of nerve block assessed by temperature sensation (alcohol swab).
- Secondary outcome:** Duration of nerve block assessed by: pinprick, pain during tonic heat stimulation, warmth detection threshold and heat pain detection threshold.

Results

Sensory test	Ropi-Dex Duration (h)	Ropi-Placebo Duration (h)	Mean difference	95% [CI] of the difference	P-value
Temperature sensation	22.2	20.0	2.1	1.1 to 3.3	0.001
Pinprick	22.6	20.2	2.4	1.4 to 3.3	<0.001
Pain during tonic heat stimulation	22.1	20.5	1.6	0.6 to 2.8	0.005
Warmth Detection Threshold	22.6	20.9	1.7	0.2 to 3.1	0.024
Heat Pain Detection Threshold	21.2	20.1	1.1	-0.1 to 2.3	0.068

20 ml ropivacaine 0,5% + 100µg dexmedetomidine

20 ml ropivacaine 0,5% + placebo

Bilateral adductor canal blocks

Conclusion

Dexmedetomidine used as an adjuvant to ropivacaine prolongs the duration of an adductor canal block by a peripheral mechanism in healthy volunteers, but not necessarily to a clinically relevant extent.