Peripheral nerve block anaesthesia is superior to spinal anaesthesia regarding postoperative pain control in primary ankle fracture surgery: results from the randomised “AnAnkle Trial”

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Background:

Peripheral nerve blocks (PNB) are gaining popularity in acute fracture surgery, but rebound pain following PNB might outweigh the benefits of longer analgesia.

“AnAnkle Trial” aimed to investigate the effect of PNB anaesthesia compared with spinal anaesthesia (SA) on postoperative pain in acute ankle fracture surgery.

Methods:

Randomised, open label, dual centre trial on adults undergoing ankle fracture surgery. Ethically approved and GCP audited. PNB anaesthesia or SA randomised 1:1. Exclusion: habitual opioid use, multi-trauma, proximal fibular fractures, neurological dysfunction. PNBs: ultrasound guided, popliteal sciatic and mid-femoral saphenous blocks with ropivacaine. SAs: unilateral with hyperbaric bupivacaine. Postoperatively: paracetamol, ibuprofen and patient controlled i.v. morphine (PCA). Data: patient-registered pain scores 0-10 (NRS) every three hours for 27 hours and PCA morphine.

Primary endpoint: a combined pain intensity and opioid consumption (PIOC) score calculated by ranking both the NRS area under the curve (AUC) and total morphine 0-27h across both groups. PIOC is the sum of deviation from the mean ranks.

Effect size is the probability of having a better PIOC with PNB (p’). NRS AUC and total morphine were analysed separately as secondary endpoints.

Results and Discussion:

150 patients were included. Median age 55 yrs (18-84, range), 65% women. The groups had comparable demographics, comorbidity, time to surgery, fracture types and preoperative pain. Conversion to general anaesthesia was necessary in five patients with PNB and none with SA (difference not significant). PIOC was significantly lower in the PNB group (figure, p<.001). Probability of a better PIOC with PNB: p’=74.8% (67.0-82.6, 95%CI). The secondary endpoints also yielded significant reductions in the PNB group (table). However, post-block pain levels and opioid need in the PNB group also indicate a considerable rebound pain when the PNBs subside.

Variable	PNB (n = 77)	SA (n = 73)	P value
AUC 0-27 h pain score, NRS*hours, median (IQR [range])	37.5 (20.3-54.0 [0-102])	72.0 (43.5-102.0 [6-177])	<.001
Morphine 0-27 h, mg, median (IQR [range])	20.0 (12.5-38.8 [0-97])	32.5 (18.2-65.0 [0-132])	.001

Conclusions: PNB anaesthesia is efficient for ankle fracture surgery and provides superior postoperative pain control compared with SA. However, the rebound pain following cessation of the blocks warrants attention in clinical practice.