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THE BRASS TACKS: CONCISE REVIEWS OF PUBLISHED EVIDENCE

Peripheral nerve block for hip fracture

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NNT color recommendation	Green (benefit > harm)
Summary heading	Peripheral nerve block for hip fracture reduced pain, time to mobilization after surgery, delirium, and chest infections
Benefits in NNT	Reduced pain on movement by 2.5 on a scale of 1 to 10, compared with no nerve block or placebo 1 in 14 were helped (delirium prevented) 1 in 7 were helped (chest infections prevented)
Benefits in percentages (absolute risk reduction)	Reduced pain by 2.5 on a 1 to 10 scale, compared to no nerve block or placebo 7.3% lower risk of acute delirium 15.9% lower risk of chest infections
Harms in NNT (NNH)	Not reported
Harms in percentages	Not reported
Efficacy endpoints	Pain on movement 30 minutes after block, time to first mobilization after surgery, delirium, myocardial infarction, chest infections, and all-cause mortality
Harm endpoints	No harm endpoints reported
Who was in the studies	2,750 adults admitted to the hospital with acute hip fracture awaiting operative repair in 23 countries; mean age range 59–89

Editor's Note: Brass Tacks are concise reviews of published evidence. This series is a result of collaboration between *Academic Emergency Medicine* and the evidence-based medicine website, www.TheNNT.com. For inquiries please contact the section editor, Shahriar Zehtabchi, MD (Shahriar.zehtabchi@downstate.edu).

NARRATIVE

Between 2000 and 2010, there were 2.6 million hospitalizations for hip fractures in the United States among women over 55 years of age alone.[1] This is nearly as many hospitalizations as those for myocardial infarction or stroke among that same population and outnumbered hospitalizations for all other fractures combined.[1] Studies have also demonstrated an increased risk for mortality in the months after hip fracture.[2] While pain from hip fractures is often treated with intravenous opioids, these agents can lead to respiratory depression and delirium.[3,4] Peripheral nerve blockade (PNB) is a method of injecting local anesthetic into nerves that supply the hip region in an attempt to reduce pain. This alternative method of pain control may reduce the quantity of opioids needed,[5,6] improve pain and mobility,[7] and reduce complications of immobilization.[6]

The Cochrane review summarized here included all parallel randomized controlled trials (RCTs) and cluster RCTs comparing PNB versus sham block or no block among adult patients (age > 16 years) with hip fracture.[8] PNBs were mostly femoral nerve (22 studies) or fascia iliaca compartment blocks (21 studies) and could be performed preoperatively, intraoperatively, or postoperatively. Outcomes summarized here included pain on movement 30 minutes after block placement, delirium within 30 days, time to mobilization after surgery, and chest infection (as defined by the individual study authors).

The review identified 49 trials, 43 of which (n = 2,750) were pooled for meta-analysis. Only 15 used ultrasound guidance, while 14 used a nerve stimulator. The remaining studies used a landmark-based technique or did not describe the technique. Sixteen studies were performed in the emergency department (ED). PNB reduced

pain within 30 minutes of block placement (standardized mean difference = −1.0, 95% confidence interval [CI] = −1.3 to −0.9, equivalent to −2.5 on a scale from 0 to 10; quality of evidence high) when compared to no block or sham. PNB also reduced delirium (risk ratio [RR] = 0.7, 95% CI = 0.5 to 0.9, absolute risk reduction [ARR] = 7.3%, number needed to treat [NNT] = 14; quality of evidence high). Three studies reporting on chest infections found a reduced incidence with PNB (RR = 0.4, 95% CI = 0.2 to 0.9, ARR = 15.9%, NNT = 7; quality of evidence moderate). Three studies reporting time to mobilization also found a reduction (mean difference = −10.8 hours, 95% CI = −12.8 to −8.8 hours).

CAVEATS

There are several limitations associated with this meta-analysis. First, studies varied with regard to PNB technique and location, with the majority using either the fascia iliaca or the femoral nerve block. Additionally, there were differences in choice of agent (e.g., bupivacaine, ropivacaine, lidocaine), concomitant use of epinephrine or corticosteroids, and single injection versus continuous infusion. Most blocks were performed by anesthesiologists in the perioperative setting. Some studies used a sham block, while others did not use a placebo. There were differences in the definitions for delirium and chest infections, as well as the pain scoring tools used between studies. There were also limited data for chest infections with only 131 total patients for this outcome. Moreover, they did not assess adverse events, which is a critical gap. However, data suggest that adverse events are rare, with permanent nerve injury occurring in 0.03% of PNBs[9] and local toxicity occurring in 1.3 per 10,000 PNBs.[10] Unfortunately, local reactions, tissue infections, and other adverse effects were not reported. Finally, it is worth noting that most studies were small and performed predominately by experts in regional analgesia, which may not fully reflect the average user.

The American Academy of Orthopedic Surgeons recommends regional analgesia for preoperative pain control in patients with hip fracture (strong evidence).[11] Based on the available evidence, the review summarized here found that PNB reduced pain on movement, shortened time to first mobilization, and resulted in lower rates of delirium and chest infections. Thus, we have assigned a color recommendation of green (benefit > harm) for PNB for hip fracture. Further study is needed to evaluate PNB in periods and settings other than the perioperative period and the potential benefit of continuous infusion versus single injection. However, current data support that this would be a valuable intervention for hip fractures that could be utilized in the ED.

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