

The Effects Of Dexamethasone As An Analgesic Adjuvant To Multimodal Pain Treatment After Total Knee Arthroplasty: The DEX-2-TKA Randomised Clinical Trial

Orthopaedics / Knee & Lower Leg / Joint Replacement - Primary

Kasper Smidt Gasbjerg¹, Daniel Hägi-Pedersen², Troels Lunn³, Peter Lindholm⁴, Niels Anker Pedersen⁵, Henrik Morville Schrøder⁶, Martin Lindberg-Larsen⁷, Kasper Højgaard Thybo⁸, Stig Brorson⁹, Søren Overgaard¹⁰, Janus Christian Jakobsen¹¹, Ole Mathiesen⁸

1. Research Centre of Anaesthesiology and Intensive Care Medicine, Næstved, Slagelse and Ringsted Hospitals, Næstved, Denmark
2. Research Centre of Anaesthesiology and Intensive Care Medicine, Næstved, Slagelse and Ringsted Hospitals, Slagelse, Denmark
3. Bispebjerg and Frederiksberg Hospital, University of Copenhagen, Copenhagen, Denmark
4. Department of Anaesthesiology and Intensive Care, Odense University Hospital, Odense, Denmark
5. Department of Anaesthesia, Gildhøj Private Hospital, Brøndby, Denmark
6. Department of Orthopaedic Surgery, Næstved-Slagelse-Ringsted Hospitals, Næstved, Denmark
7. Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Odense, Denmark
8. Centre for Anaesthesiological Research, Department of Anaesthesiology, Zealand University Hospital, Køge, Denmark
9. Department of Orthopaedic Surgery, Zealand University Hospital, Køge, Denmark
10. Department of Orthopaedic Surgery and Traumatology Bispebjerg and Frederiksberg Hospital, University of Copenhagen, Copenhagen, Denmark
11. Copenhagen Trial Unit Centre for Clinical Intervention Research, Rigshospitalet, Copenhagen University Hospital, Capital Region of Denmark, Copenhagen, Denmark

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Background

Total knee arthroplasty is a frequent procedure associated with moderate to severe postoperative pain. Dexamethasone is often used after surgery, but the evidence for its analgesic effect is sparse especially for high and repeated doses.

Objectives

To investigate the analgesic effect of one and two doses of intravenous dexamethasone as an adjuvant in a multimodal pain treatment in patients after total knee arthroplasty (TKA).

Study Design & Methods

DESIGN: Randomised, blinded, placebo-controlled trial with 90 days follow-up.

SETTING: Five Danish hospitals, September 2018 to March 2020. PARTICIPANTS: 485 adult participants undergoing TKA.

INTERVENTIONS: Using a computer-generated randomised sequence stratified for site, participants were allocated into three groups: DX1 (dexamethasone (24 mg) + placebo); DX2 (dexamethasone (24 mg) + dexamethasone (24 mg)); or placebo (placebo + placebo). The intervention was given preoperatively and 24 hours after surgery, with blinding of participants, investigators, and outcome assessors. All participants received paracetamol, ibuprofen, and local infiltration analgesia.

MAIN OUTCOME MEASURES: The primary outcome was total intravenous morphine consumption 0–48 hours postoperatively. Multiplicity adjusted threshold for statistical significance was $P < 0.017$ and minimal important difference was 10 mg morphine. Other outcomes included postoperative pain and adverse events.

Results

We randomised 485 participants: 161 in DX1, 162 in DX2, and 162 in placebo. Data from 472 participants (97%) were included in the primary outcome analysis. The median (IQR) 0–48 hours morphine consumptions were: DX1 37.9 mg (20.7–56.7); DX2 35.0 mg (20.6–52.0); and placebo 43.0 mg (28.7–64.0). Hodges-Lehmann median differences between groups were: 2.7 mg (98.3% confidence interval (CI), -3.7 to 9.3, $P = 0.30$) between DX1 and DX2; -7.8 mg (98.3% CI, -14.7 to -0.7, $P = 0.008$) between DX1 and placebo; and -10.7mg (98.3% CI, -17.3 to -4.0, $P < 0.001$) between DX2 and placebo. Postoperative pain was reduced at 24 hours with one dose, and at 48 hours with two doses of dexamethasone.

Conclusions

Two doses of dexamethasone reduced both morphine consumption and pain levels after TKA