Pain management in Orthopaedics

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Introduction

- Brief update
- Two main topics
  - Use of Gabapentin
  - Local Infiltration Analgesia – toxicity question???

Gabapentin – what's the evidence?

Gabapentin & Pregabalin

Do Surgical Patients Benefit from Perioperative Gabapentin/Pregabalin? A Systematic Review of Efficacy and Safety

- anti-allodynic
- anti-hyperalgesic
- reduction of central sensitisation
- opioid sparing (~30mg - not dose dependent)

Anesth Analg 2007;104:1545-56

Gabapentin

Gabapentin and postoperative pain – a systematic review of randomized controlled trials

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Received 7 February 2006; received in revised form 13 May 2006; accepted 12 June 2006

- Reduced pain scores
- Reduced morphine consumption
- Reduced opioid side effects
- Increased sedation in some

- **Optimal dose & duration not defined yet**

Multimodal analgesia with gabapentin, ketamine and dexamethasone in combination with paracetamol and ketorolac after hip arthroplasty: a preliminary study.

Rasmussen ML, et al. Eur J Anaesthesiol. 2010 Apr;27(4):324-30.

Adding gabapentin to a multimodal regimen does not reduce acute pain, opioid consumption or chronic pain after total hip arthroplasty.

Clarke H, et al. Acta Anaesthesiol Scand. 2009 Sep;53(8):1073-83.

CONCLUSIONS: A single 600 mg dose of gabapentin given pre-operatively or post-operatively does not reduce morphine consumption or pain scores in hospital or at 6 months after hip arthroplasty within the context of spinal anesthesia and a robust multimodal analgesia regimen.

Gabapentin does not improve multimodal analgesia outcomes for total knee arthroplasty: a randomized controlled trial.

Paul JE et al Can J Anaesth. 2013 May; 60(5):423-31.

- **PURPOSE:**
  - This study assessed whether gabapentin given preoperatively and for two days postoperatively
- **METHODS:**
  - This single-centre double-blind randomized controlled trial
  - The primary outcome was cumulative morphine consumption at 72 hr following surgery. Secondary outcome measures included pain scores and patient satisfaction.
- **RESULTS:**
  - The average cumulative morphine consumption at 72 hr postoperatively was 66.3 mg in the gabapentin group and 72.5 mg in the placebo group (P = 0.59).
- **CONCLUSION:**
  - Gabapentin 600 mg po given preoperatively followed by 200 mg po every eight hours for two days has no effect on postoperative morphine consumption, pain scores, patient satisfaction, or length of hospital stay. This trial is registered at ClinicalTrials.gov NCT01307202.

Local Infiltration analgesia - TKA

Contents lists available at ScienceDirect

The Knee

An enhanced recovery programme for primary total knee arthroplasty in the United Kingdom — follow up at one year

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ABSTRACT

The concepts of Enhanced Recovery Programmes (ERP) are to reduce peri-operative morbidity whilst accelerating patient's rehabilitation resulting in a shortened hospital stay following primary joint

The Knee 20 (2013) 319–323

Contents lists available at ScienceDirect

The Knee

An anatomic study of local infiltration analgesia in total knee arthroplasty☆

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Is local infiltration toxic?

Ropivacaine plasma levels following local infiltration analgesia for total knee arthroplasty:

a subset analysis

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4. Department of Anaesthetics, Hamad Medical Corporation, Qatar.

Study aims

Following local infiltration with high dose ropivacaine in elderly patients undergoing TKA:

1. Analyse total and free plasma concentrations of ropivacaine.

2. Record signs and symptoms of LA toxicity.

Inclusion criteria	Exclusion criteria
≥65yo	Sensitivity/allergy amide anaesthetics
1º unilateral TKA	Unable to give informed consent
Written informed consent	Cardiac/ respiratory/ hepatic/ renal failure

- **Premedication**
  - Night before surgery
    - Temazepam 20mg
    - Gabapentin 600mg
  - 2h prior to surgery
    - Temazepam 20mg
    - Paracetamol 1g
    - Dexamethasone 10mg

- **Spinal anaesthesia**
  - 2.5ml 5mg/ml hyperbaric bupivacaine
  - Propofol sedation

- **400mg Ropivacaine (2mg/ml without adrenaline) infiltration**
  - 180ml (360mg) perioperatively
  - 20ml (40mg) via catheter after wound closure

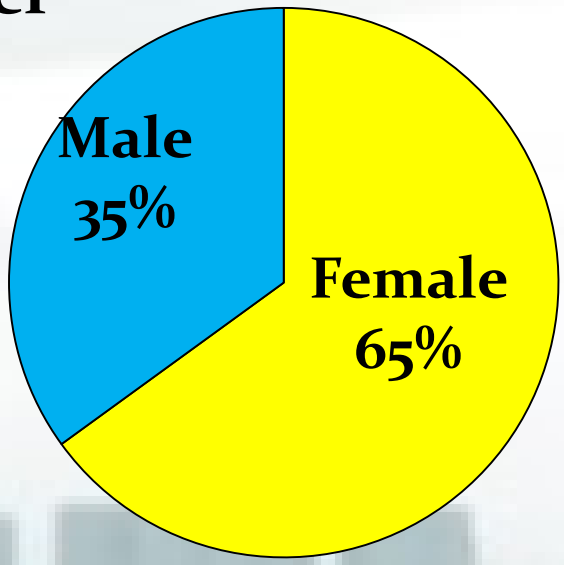
Methods n=20 (ii)

- **Free & total ropivacaine venous blood sampling:**
  - Baseline (before spinal anaesthesia)
  - Every 5min until 30min after tourniquet release
  - 1h and 4h after tourniquet release
- **Evidence of LA toxicity recorded:**
  - Continuous ECG monitoring
  - LOC
  - Seizures
  - Cardiac arrest
  - Light-headedness
  - Blurred vision
  - Oral tingling
  - Auditory disturbances
- **Ethical approval granted** (WoSREC)
  - NCT01873313

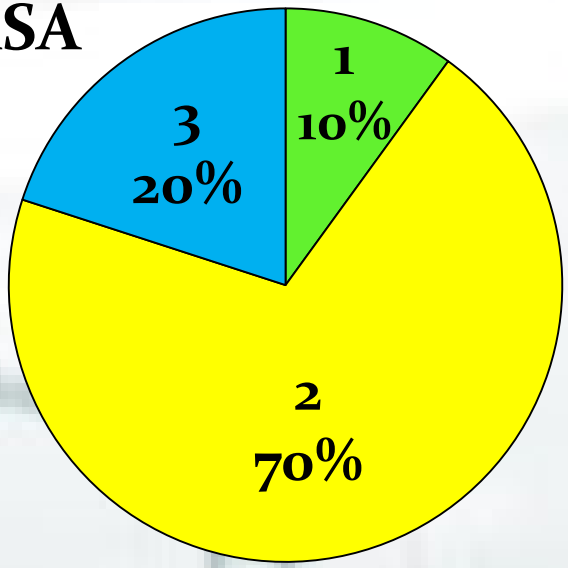
Results (i)

Demographics

Gender



ASA



n=20

Variable	Mean±SD	Range
Age (years)	72.5±5.6	65.3-82.3
Weight (kg)	76.6±10.3	58.4-94.0
BMI (kg/m²)	28.9±5.0	20.1-37.7
Ropivacaine dose (mg/kg)	5.3±0.8	4.3-6.8

Results (ii)

Ropivacaine plasma levels

179 samples (1 missing at 4h)

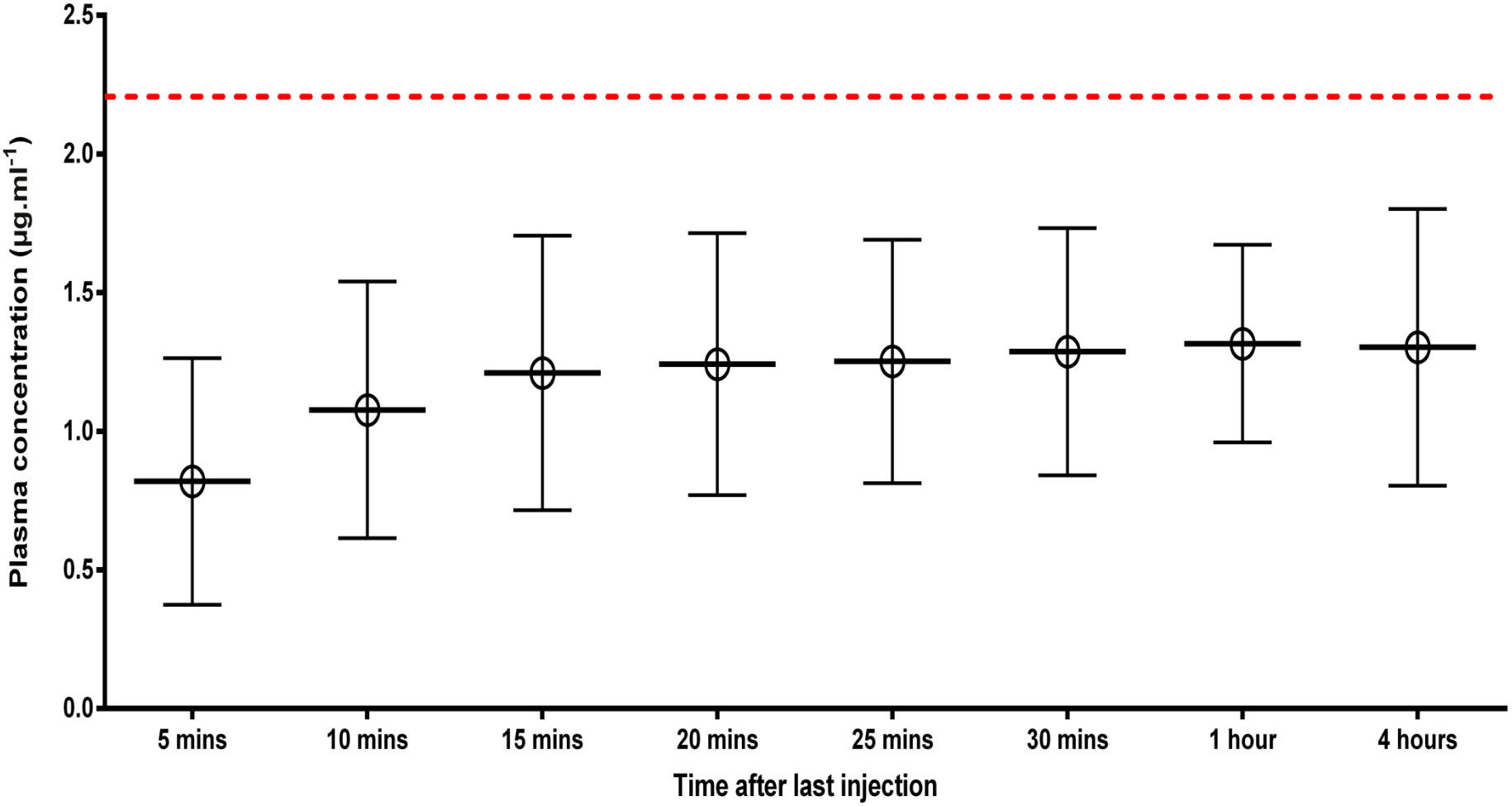
- **Free ropivacaine levels**
  - Mean 0.029µg/ml
  - Range 0.003 – 0.072µg/ml
- **Total ropivacaine levels**
  - Mean 1.187µg/ml
  - Range 0.141 – 2.896µg/ml

Maximum tolerated venous plasma concentrations[1]
Free 0.15µg/ml
Total 2.20µg/ml

1. Knudsen K et al. *Br J Anaesth* 1997; 78: 507-514.

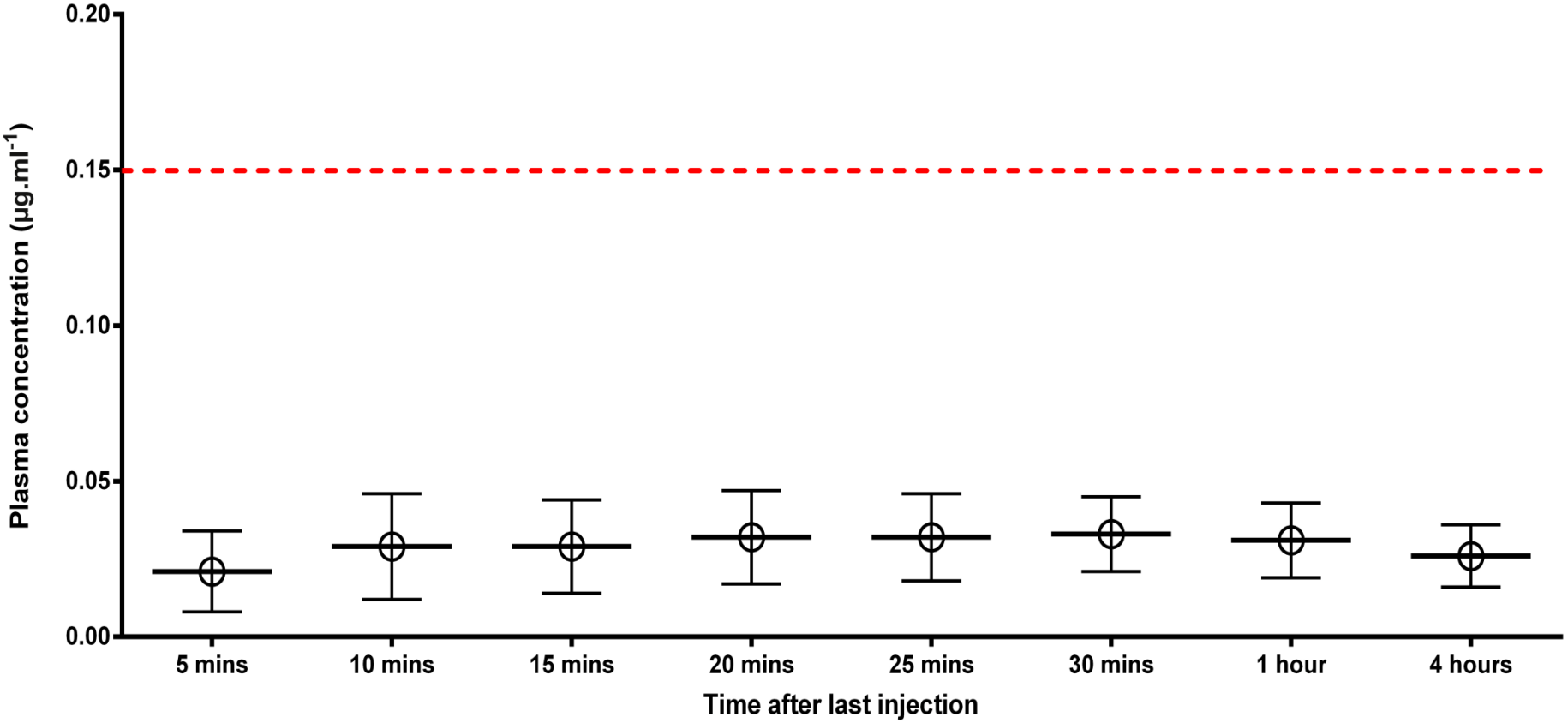
Results (iii)

Total ropivacaine plasma levels



Results (iv)

Free ropivacaine plasma levels



Results (iv)

Toxicity

ECG monitoring

All SR with exception of 1 with pre-existing AF

Blurred/ double vision 15% (3)

1. Slight blurred vision at 20min sample
2. Blurred vision 90min following tourniquet release
3. Double vision at 60min sample

All resolved spontaneously

All had free and total ropivacaine levels below toxicity

Conclusions

- Free ropivacaine measurements were below toxic levels.
- All minor symptoms of possible LA toxicity resolved spontaneously.
- No major signs/symptoms of LA toxicity were reported.

Local infiltration of ropivacaine appears to be safe in elderly patients undergoing TKA.

Conclusion

- We still have a lot to learn!

- SAVE THE DATE

- 31st January 2014
- Enhanced Recovery Arthroplasty – Trials and Tribulations
- Golden Jubilee National Hospital
  - 4th National Audit Results
  - Pre Meds do we need them?
  - Vasovagal – how can we reduce them?
  - You don't need physiotherapy on discharge!