

# Anaesthesia and Systemic Analgesia for lower limb arthroplasty

Nick B Scott

ERAS 2011

11<sup>th</sup> September

Bath

# Pain prevents some patients from mobilising following lower limb arthroplasty BUT

- Attitude
- Staff attitudes
- Ambience
- Motivation
- Fear
- MORBIDITY
- Stiffness
- Dizziness
- PONV
- Systems
- Attachments

“Although pain management contributes to global satisfaction, its influence is far less than... continuity of care.”

The role of pain for early rehabilitation  
in fast track total knee arthroplasty.

Holm B et al

Disability & Rehabilitation. 32(4):300-  
6, 2010

Pain has a limited influence on the functional recovery beyond the first postoperative day after TKA.....

# Sub-acute pain and function after fast-track hip and knee arthroplasty

Andersen LO et al

Anaesthesia 64(5): 508-13, 2009

- Fast-track THA resulted in acceptable levels of pain ..... in over 95% of patients after discharge.
- However, after TKA 52% patients reported moderate pain and 16% severe pain when walking 1 month after surgery. These results emphasise the need for improvement in analgesia after discharge following total knee arthroplasty.

Analgesia is a quality issue

So is PONV



Analgesia is a quality issue

All forms of RA have more  
to offer

Primary aims of anaesthesia and analgesia are to provide/ensure low morbidity and near-immediate post-operative mobilisation

Good balance between analgesia and ability to mobilise

NB

Level 1 evidence against the use  
of opioids as a primary (sole)  
analgesic regime

# Non-opioid Multimodal Analgesia

- Pre-emptive
- Preventive
- Practical

# Multi-modal “balanced” analgesia

## Opioid - sparing drugs

20 - 100% reduction in opioid requirements

- NSAID's
- COX-2 inhibitors
- Paracetamol
- Magnesium
- Preconditioning
- Esmolol
- Mobilisation
- Clonidine
- Ketamine
- Gabapentin/pregabalin
- Local anaesthetics NB 100%
- NB Dexamethasone

# Multi-modal “balanced” analgesia

## Opioid - sparing drugs

20 - 100% reduction in opioid requirements

- NSAID's
- COX-2 inhibitors
- Paracetamol
- Magnesium
- Preconditioning
- Esmolol

- Mobilisation
- Clonidine
- Ketamine
- Gabapentin/pregabalin
- Local anaesthetics NB 100%
- NB Dexamethasone

# Gabapentin/Pregabalin

- Menigaux C et al **Preoperative gabapentin decreases anxiety and improves early functional recovery from knee surgery.** Anesth Analg 100:1394-9, 2005
- Turan A et al. **Effect of oral gabapentin on postoperative epidural analgesia** BJA 96(2):242-6, 2006
- Clarke H. et al **Gabapentin decreases morphine consumption and improves functional recovery following total knee arthroplasty** Pain Research & Management. 14(3):217-22, 2009
- Clarke H et al. **Adding gabapentin to a multimodal regimen does not reduce acute pain, opioid consumption or chronic pain after total hip arthroplasty.** Acta Anaesthesiol Scand 53(8):1073-83, 2009

# Premedication

## Dexamethasone 8-16mg IV

- Analgesic/Happy Pill
- Anti-inflammatory
- Anti-emetic
- Hyperglycaemic
- And is useful in

- Aspiration
- Anaphylaxis
- Hypoxia
- Does not cause wound problems
- So just give it!!!



# Perioperative Single Dose Systemic Dexamethasone for Postoperative Pain: A Meta-analysis of Randomized Controlled Trials

De Oliveira GS et al

Anesthesiology  
2011 Jul [Epub ahead of print].

Twenty-four randomized clinical trials with 2,751 subjects were included.

‘Dexamethasone at doses between 0.1 – 0.2 mg/kg is an effective adjunct in multimodal strategies to reduce postoperative pain and opioid consumption after surgery.’

- Holte K, Kehlet H Perioperative single-dose glucocorticoid administration: pathophysiologic effects and clinical implications  
J American Coll Surgeons 2002 195;5: 694-712
- Eberhart LH et al Impact of a single perioperative dose of dexamethasone on the incidence of surgical site infections: A case-control study. 2011 [Epub ahead of print]

# Premedication

## A<sub>2</sub> agonists

150mcg clonidine as effective as 10 mg morphine  
“underused by UK anaesthetists”

- Sedation
- Sympatholysis
- Reduced analgesic requirements
- Reduced PONV and ileus
- Reduced secretions
- Reduced shivering
- Facilitate glycaemic control in diabetics
- Decreased blood loss
- Decreased cvs morbidity

# Clonidine (Epidural)

- Carabine UA et al. Extradural clonidine infusions for analgesia after total hip replacement. BJA 68: 338-43 1992
- Carabine UA et al. Extradural clonidine and bupivacaine for postoperative analgesia. BJA 68: 132-5, 1992
- Milligan KR et al. The efficacy and safety of epidural infusions of levobupivacaine with and without clonidine for postoperative pain relief in patients undergoing total hip replacement. Anesth Analg 91: 393-7, 2000
- Forster GA, Rosenberg PH Small dose of clonidine mixed with low-dose ropivacaine and fentanyl for epidural analgesia after total knee arthroplasty BJA 93 (5):670-677, 2004
- Dobrydnjov I et al Improved analgesia with clonidine when added to local anesthetic during combined spinal-epidural anesthesia for hip arthroplasty: a double-blind, randomized and placebo-controlled study. Acta Anaesthesiol Scand 49(4):538-45, 2005

# Low-dose Ketamine

- Remerand F et al **The early and delayed analgesic effects of ketamine after total hip arthroplasty: a prospective, randomized, controlled, double-blind study.** Anesth Analg 109(6): 1963-71, 2009
- Aveline C et al. **Postoperative analgesia and early rehabilitation after total knee replacement: a comparison of continuous low-dose intravenous ketamine versus nefopam** Eur J Pain 13(6):613-9, 2009
- Perrin SB. Purcell AN. **Intraoperative ketamine may influence persistent pain following knee arthroplasty under combined general and spinal anaesthesia: a pilot** Anaesthesia & Intensive Care. 37(2):248-53, 2009
- Adam F et al **Small-dose ketamine infusion improves postoperative analgesia and rehabilitation after total knee arthroplasty.** Anesthesia & Analgesia. 100(2):475-80, 2005

# IV lidocaine

Lack of impact of intravenous lidocaine on analgesia, functional recovery, and nociceptive pain threshold after total hip arthroplasty.

Martin

F et al

Anesthesiology

109(1):118-23, 2008

ERAS



RA

RA

Spinal  
Epidural  
CSE/SSE  
Infiltration  
MMRA

# Spinal/Epidural LA

- Reduced blood loss
- Reduced thromboembolism
- Reduced PONV
- Reduced SSI
- 'Universal standard of care'

# Spinal/Epidural LA

- Reduced blood loss
- Reduced thromboembolism
- Reduced PONV
- **Reduced SSI !!**
- 'Universal standard of care'

# Can we improve spinal for LLA?

- NB minimal block
- Remove opioid
- ?unilateral
- ?prilocaine
- ?? low dose clonidine

# Can we improve spinal for LLA?

- NB minimal block
- **REMOVE** opioid
- ?unilateral
- ?prilocaine
- ?? low dose clonidine

- low dose IT morphine results in PONV and pruritus.
- Urinary retention is more common after intrathecal opioids than after IV or IM administration and does not appear to be dose-related.

Does continuous peripheral nerve block provide superior pain control to opioids? A meta-analysis

Richman JM et al.

Anesth Analg 2006;102:248-57

Efficacy of postoperative patient-controlled and continuous infusion epidural analgesia versus intravenous patient-controlled analgesia with opioids : a meta-analysis.

Wu CL et al

Anesthesiology 2005 ; 103(5) : 1079-88



NB

Level 1 evidence against the use  
of opioids as a primary (sole)  
analgesic regime

**REMOVE opioid**

# Peripheral Nerve Blocks

Ambulatory continuous femoral nerve blocks decrease time to discharge readiness after tricompartment total knee arthroplasty: a randomized, triple-masked, placebo-controlled study.

Ilfeld BM et al

Anesthesiology. 108(4):703-13, 2008

Health-related quality of life after tricompartment knee arthroplasty with and without an extended-duration continuous femoral nerve block: a prospective, 1-year follow-up of a randomized, triple-masked, placebo-controlled study.

Ilfeld BM et al

Anesthesia & Analgesia 108(4):1320-5,  
2009

Health-related quality of life after hip arthroplasty with and without an extended-duration continuous posterior lumbar plexus nerve block: a prospective, 1-year follow-up of a randomized, triple-masked, placebo-controlled study.

**Ilfeld BM et al**

**Anesthesia & Analgesia. 109(2):586-91,  
2009**

- 'We found no evidence that extending an overnight continuous .....block to 4 days improves (or worsens) subsequent health-related quality of life between 7 days and 12 mo after TKA'

# Complications of femoral nerve block for total knee arthroplasty.

Sharma et al

Clinical Orthopaedics & Related  
Research.

468(1):135-40, 2010

- 709 single-shot FNBs for TKR
- 12 pts (1.6%) treated with FNB sustained falls
- 3 pts (0.4%) underwent reoperations.
- 5 pts had postoperative femoral neuritis, which may have been secondary to the block.
- 'Femoral nerve block before TKA is not a harmless intervention'



Determination of the EC50 of levobupivacaine for femoral and sciatic perineural infusion after total knee arthroplasty.

Macleod GA et

al.

BJA 102(4):528-33, 2009

# Wound infiltration

# Philosophy

- Positive attitude by all staff
- Clear description of technique
- Emphasis on early mobilisation
- “Not a disease, not ill” **ACTIVE PARTICIPANT**
- **INDEPENDENCE** –nurses available but not overly protective

# GJNH Technique - MMA

## Pre-operative

Gabapentin 600mg

Dexamethasone 8 -16mg

12mcg fentanyl patch

Ketamine 15-30mg

(Clonidine 100mcg)

GJNH Technique - MMA  
intra-operative

Spinal + LIA  
Ketamine supplements

# GJNH Technique - Post-op

## Hips

- Ibuprofen 400mg tds for 4 days
- Paracetamol/Acetaminophen 1gm qid for 4days
- Gabapentin 600mg PON1
- 12mcg Fentanyl patch
- LIA

Knees as above plus I-A ropivacaine 0.2% 40ml x3

# Summary

- Excellent technique
- National Standard of Care
- Strict adherence to technique
- Team sport
- Good balance between analgesia and ability to mobilise
- Any proposed 'alternative' technique must have lower morbidity!