Neurobiologic aspects of preventing acute and chronic pain

Clifford Woolf
Bupivacaine – Voltage-gated sodium channels

Sural nerve territory – mechanical hyperalgesia

Withdrawal duration (s)

Days post SNI surgery

Sural nerve territory – cold hyperalgesia

Withdrawal duration (s)

Days post SNI surgery
<table>
<thead>
<tr>
<th>Response</th>
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<tbody>
<tr>
<td>Stimulus</td>
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Thorn in the foot model of pain  
Symptom control
Pregabalin – A2D3 - VGCC

Von Frey filaments

Withdrawal threshold

- Vehicle ipsi
- PGB 300 µg/day ith. ipsi
- PGB 900 µg/day ith. ipsi
- Vehicle contra
- PGB 300 µg/day ith. contra
- PGB 900 µg/day ith. contra

B1 B2 5 10 15
SNI Days after surgery

Treatment

Acetone

Withdrawal duration

B1 B2 5 10 15

Joachim Scholz In Prep 2009
Pregabalin – A2D3 - VGCC

Von Frey filaments

Withdrawal threshold

Days after surgery

SNI

B1 B2

Vehicle ipsi

PGB 300 μg/day ith. ipsi

Vehicle contra

PGB 300 μg/day ith. contra

Joachim Scholz In Prep 2009
Central Sensitization

“Pre-emptive analgesia” PK – PD mismatch

A randomised double blind trial of the effect of pre-emptive epidural ketamine on persistent pain after lower limb amputation

John A. Wilson a, Alastair F. Nimmo a, Susan M. Fleetwood-Walker b, Lesley A. Colvin c,*
Propentofylline – Glial cell modulator

Tawfik et al. Brain Behav Imm (2007)
Diaminohydroxyypyrimidine  GCH1 inhibitor

Frequency of "leg pain"

Irmgard Tegeder In Prep 2009
Transition State - Acute to Chronic Pain
Pre-incisional epidural ropivacaine, sufentanil, clonidine, and (S)+-ketamine does not provide pre-emptive analgesia in patients undergoing major pancreatic surgery†‡