

Overview of Pain Management



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28 Sept, 2007

The Case...

- LS, 27 yo female
- CC:
 - Low back pain
 - Bilateral lower limb weakness and pain radiating down to both feet and toes
 - Dull, aching, stabbing pain, numbness, occasionally with burning sensation
 - All increasing in severity

Other S&S

- ❑ LS also has sensation loss over right LL L2-L5 dermatome
- ❑ She refuses to move due to pain
- ❑ Her LL power is limited by pain
- ❑ Exacerbation of back pain on cough

HPI

- ❑ Congenital lumbar spondylosis at L5 with instability and spinal stenosis since 2000
- ❑ Surgery done in 2001 with residual pain
- ❑ Epidural injection done but uneventful

Low Back Pain

- ❑ Pain in the low lumbar, lumbosacral, or sacroiliac region, possibly accompanied by pain radiating down one or both buttocks or legs in the distribution of sciatic nerve
- ❑ Lifetime prevalence reported as over 70% in industrialized countries
- ❑ Peak prevalence occurs between 35-55 years old

Lumbar Spondylosis

- ❑ Degenerative changes or deformity of the lumbar vertebra
- ❑ May have formation of osteophytes that narrow the spinal canal
- ❑ The bone may not be able to maintain its proper position and the vertebra can slide forward or backward (Spondylolisthesis)
- ❑ Compression of nerve root emerging from spinal cord can result in sensory system and motor system disturbances
- ❑ Present in 27-37% of the asymptomatic population
- ❑ In the US, present in >80% of individuals >40 years, increasing from 3% of individuals aged 20-29 years

Spinal Stenosis

- ❑ Narrowing of spinal canal that can be caused by excessive bone growth
- ❑ Spondylolisthesis is a cause of acquired lumbar spinal stenosis, especially at L4, L5 levels
- ❑ This can squeeze and irritate the spinal cord or the spinal nerve roots
- ❑ Manifest as pain in buttocks, thighs, or calves on walking, running, or climbing stairs

Resulting Pain

- When L5 affected:
 - Pain in the buttock, posterior lateral thigh, calf, and foot
 - “Pain radiating down to both feet and toes”
 - Weakness of the anterior tibial, posterior tibial, and peroneal muscles
 - “Bilateral lower limb weakness”
 - “Her LL power is limited by pain”

Resulting Pain

- Sensory loss over the shin and dorsal foot
 - “Sensation loss over right LL L2-L5 dermatome”
- Pain precipitated by moving the spine, which transmits pressure to the nerve root
 - “Exacerbation of back pain on cough”

Assessment

- ❑ Acute Pain, Chronic Pain & Breakthrough Pain
- ❑ Nociceptive Pain vs Neuropathic Pain
 - Nociceptive: Ongoing activation of pain-sensitive nerve fibers, where the neural pathways are intact, e.g. joint pain
 - Neuropathic: Abnormal processing of sensory input by the PNS or CNS
 - “Dull, aching, stabbing pain, numbness, occasionally with burning sensation”

Nociception

- ❑ Stimulation, Transmission, Perception, Modulation
- ❑ Modulation—Inhibition of nociceptive impulses
 - Neurons from the brain stem descend to the spinal cord and release substances such as endogenous opioids (e.g. enkephalins, dynorphins, and β -endorphins), serotonin, GABA and norepinephrine that inhibit transmission of nociceptive impulses

Treatment options for LC

- Conservative treatment with analgesics
 - Anti-inflammatory drugs, mild analgesics, muscle relaxants
- Epidural injection with corticosteroids and local anesthetics to reduce inflammation and pain
 - “Epidural injection done but uneventful”

Treatment options for LC

- Surgical procedures to relieve intractable pain from spinal stenosis and surgical fusion for spinal instability
 - “Surgery done in 2001 with residual pain”

Approach with medication treatment

- Time-contingent dosing vs as-needed dosing
- Multiple modalities to interrupt transmission at different levels
 - Combination of NSAIDs, opioids, and adjunctive analgesics

Medications

- Paracetamol
- NSAIDs
- Opioids
- Adjunctive Analgesics
 - TriCyclic Antidepressants
 - Anticonvulsants
 - Muscle Relaxants
 - Neurobion
 - Ketamine
 - Corticosteroids
 - Local Anaesthetics

Medication History of LS

- 2000—Dologesic, Diclofenac
- 2001—Dologeic & Voltaren SR + Amitriptyline + Neurobion + Carbamazepine + Codeine + Baclofen
- 2002—Tramadol injection given in in-patient
- 2005—Pethidine given in in-patient
- 2007—Morphine, Fentanyl patch

Thank You!



Paracetamol & NSAIDs

- ❑ For acute/ chronic mild to moderate pain
- ❑ Especially for bone pain and mild to moderate pain involving the musculoskeletal tissues
- ❑ Have a “ceiling effect”



TriCyclic Antidepressants

- Block reuptake of serotonin and noradrenaline
 - Enhancing pain inhibition through modulation of the descending inhibitory nerve pathway
- Has the most clinical data in neuropathic pain management

Pain Neurotransmitters

□ Excitatory

- Mediate afferent synaptic transmission
- Glutamate
- Aspartate
- ATP

□ Inhibitory

- Produce analgesia at spinal and higher levels
- gamma aminobutyric acid (GABA)
- Glycine
- Noradrenaline
- Serotonin
- Acetylcholine



Neurobion

- Vitamin B1, 6, 12
 - Deficiency causes neuropathy characterized by numbness of the feet, pins-and-needles sensations, or a burning feeling



Anticonvulsants

- ❑ Decrease neuronal excitability, thus suppressing abnormal discharges
- ❑ Gabapentin, pregabalin: Enhance GABA-mediated synaptic inhibition
- ❑ Sharp, burning, lancinating component of neuropathic pain



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Muscle Relaxants

- Baclofen, benzodiazepines e.g. diazepam
- Reduces pain associated with muscle spasticity



Opioids

- ❑ Weak opioids vs strong opioids
- ❑ For moderate-severe acute or chronic pain
- ❑ More useful for nociceptive pain than for neuropathic pain
- ❑ No “ceiling effect”
- ❑ Addiction is very rare in patients receiving opioids for pain management unless they had a predisposition to substance abuse prior to their painful condition



Opioids

□ Weak Opioids

- Dextropropoxyphene
- Codeine
- Dihydrocodeine
- Tramadol

□ Strong Opioids

- Morphine
- Methadone
- Pethidine
- Fentanyl