MAKE IT STOP. UNDERSTANDING AND MANAGING CHRONIC PAIN

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Objectives

Discuss	Discuss the pathophysiology of chronic pain
Describe	Describe the pharmacologic management of chronic pain
Describe	Describe the roll of medical marijuana in pain management

Chronic Pain

- International Association for the Study of Pain (IASP) definition:

An unpleasant sensory or emotional experience associated with actual or potential tissue damage

Generally pain persisting beyond 3 months becomes chronic

One of the most frequent reasons that individuals seek out medical care

It is a leading source of suffering and disability

Who is most affected?

- Women
- Individuals from lower socioeconomic backgrounds
- Military veterans
- People residing in rural areas

What does chronic pain cost?

Per an Institute of Medicine report:

560-635 BILLION DOLLARS PER YEAR in medical costs and lost productivity

This does not include the cost for institutionalized individuals, military personnel, and children

How does a pain signal get sent?

1

Step 1

- Transduction – Tissue injury triggers release of chemicals within the body which excites the nociceptive nerve fibers

2

Step 1

- Transmission – pain message from the skin, bones, joints, or internal organs moves toward the spine and then up to the brain. Goes from the brainstem → thalamus → cerebral cortex where it registers the pain

3

Step 3

- Perception –You are now aware or conscious of the pain

4

Step 4

- Modulation – the brain interacts with nerves to modulate or alter the pain experience. Chemicals such as endorphins and serotonin can be released to reduce pain signals.

What's different in chronic pain?

- Nociceptors typically stop firing once an injury is healed or resolved, however, in chronic pain the body can release substances that can make nociceptors more sensitive even after an injury has healed, causing them to continue to fire.

Repetitive stimulation can sensitize neurons for the long-term, resulting in excess reactivity to pain

Three Main Categories of Chronic Pain

- Nociceptive
- Neuropathic
- Nociplastic

Nociceptive Pain

Most common form of chronic pain

Results from activity in neural pathways, secondary to actual stimuli or stimuli that might damage the tissues

Examples: Arthritis, most forms of spinal pain

Neuropathic Pain

- Pain caused by damage or disease affecting the somatosensory nervous system
- Typically associated with numbness or allodynia
- May be associated with potential neurologic findings
- 15-25% of chronic pain
- Examples: diabetic neuropathy, post-herpetic neuralgia, radiculopathy

Nociplastic Pain

Pain that arises from the abnormal processing of pain signals without any clear evidence of tissue damage or discrete pathology involving the somatosensory system

Examples: Fibromyalgia, Irritable Bowel Syndrome

Pathophysiologic mechanisms:

Augmented sensory processing and diminished inhibitory pathways

Procedural interventions associated with poorer outcomes

Does Genetics Contribute?

- Sensitivity to painful stimuli and pain tolerance are partly genetically determined
- Chronic pain is a heritable phenotype, and presence of chronic pain clusters in family groups
- 150 genes associated with chronic pain in humans

How about Trauma?

- Individuals who have had early life trauma (ex death of a parent) or physical trauma (substantial hospitalization/preterm birth) have a higher risk of chronic pain in their adult lives
- Study of traumatic adverse childhood experiences (ACEs) in children found that the most common ACE in children with chronic pain was having family members with mental health illnesses
- 55% of children with multiple ACEs experience chronic pain
- People who have experienced personal violence or abusive relationships are more likely to subsequently experience chronic pain

Management of Chronic Pain

- Goals:
  - Improvement in Quality of Life
  - Improvement of Function

Treatment of Chronic Pain

- Interdisciplinary and Multimodal treatment approach
  - Self care
  - Pharmacologic Therapies
  - Psychological Therapies
  - Integrative Treatments
  - Procedures

Self Care Approach

- Healthy Lifestyle
- Exercise
- Nutrition
- Proper Sleep Hygiene
- Smoking Cessation
- Ergonomic Modifications

Psychotherapy

Cognitive Behavioral Therapy (CBT) - Restructuring maladaptive beliefs, attitudes, and behaviors that contribute to disease burden

- Originally developed for treatment for depression
- Typically focuses on symptom relief and increasing physical functioning

Participants are taught to:

- Alter unhelpful thoughts and beliefs in a manner better aligned with the management of pain
- Use new behavioral skills to decrease pain and increase functioning
- Increase use of adaptive coping strategies
- Can be stand alone or in combination with other therapies
- A strong therapeutic relationship is necessary for maximizing CBT effect
- Best candidates are motivated, educated individuals with clearcut goals and comorbid mood or anxiety disorders, or both, that amplify pain

Medication Management

- Nonopioid vs Opioid

Non-Opioid Pain Management – Neuropathic Pain

- Analgesic antidepressants (nortriptyline, amitriptyline)
  - Noradrenaline important for inhibition of neuropathic pain. Increase of noradrenaline in the spinal cord by reuptake inhibition directly inhibits neuropathic pain through alpha-1 adrenergic receptors.
  - Increase in noradrenaline acts on locus coeruleus and improved impaired descending noradrenergic inhibitor system.
  - Serotonin and dopamine may reinforce the noradrenergic effects to inhibit neuropathic pain

Non-Opioid Pain Management – Neuropathic Pain

- Antiepileptic Drugs (Gabapentin and Lyrica)
  - Similar to GABA (gamma amino butyric acid) which occurs in our nervous system
  - Bind to calcium ion channels and therefore affect nerve transmission and reduce pain
- Topical Lidocaine – topical anesthetic
- Capsaicin – binds to VR receptors and strips nerves of substance P, a pain signaling neurotransmitter. Prevents nerves from transmitting pain signals to the brain

Nonopioid Pain Management Non-neuropathic Pain

- First Line
  - Topical and oral NSAIDS
  - Little evidence for muscle relaxants in chronic pain
  - Analgesic Antidepressants (nortriptyline, amitriptyline)

Opioid Pain Management

No longer first line treatment for any form of chronic pain

May be considered if other modalities do not provide adequate pain relief and the anticipated/functional benefits outweigh the potential harm to the patient

Opioids – block messages from the body to the spinal cord to the brain

Common opioids: Codeine, fentanyl, hydrocodone, oxycodone, morphine

Can be efficacious in short and intermediate term, if cognizant of the risks

Risks to Use of Opioids

- Risks
  - Misuse, abuse, addiction
    - Rates of abuse and misuse higher than addiction
  - Immunosuppression
  - Sleep apnea
  - Osteoporosis
  - Hormonal changes including reduced fertility and sexual dysfunction
  - Increased risk of myocardial infarction

Risk Factors for Opioid Abuse

- Young age (less than 30 years)
- Substance abuse and smoking history
- Psychological Stress
- Trauma
- Pre-existing legal problems
- Poor Social Support
- Disease related factors (such as unclear cause of pain)

Nonsurgical Interventional Treatment

- Minimally invasive procedures
  - Epidural steroid injections
  - Radiofrequency ablation
  - Can be use for diagnostic or therapeutic purposes

Integrative Therapies

- Acupuncture – stimulates nerves and connective tissue, thereby having an effect on the brain. Improved function results in body producing it's own chemicals involved in pain relief, reduction of inflammation, releases neurotransmitters that create a feeling of relaxation and well-being
- Massotherapy – manipulating muscles and tissues can enhance function, stimulate healing, promote relaxation and well-being
- Reiki – may help decrease pain perception by healing the emotional component of pain. Resolves emotional distress by allowing energy to flow freely resulting in relaxation and reduced pain and tension
- Tens Unit – electrical pulses can release endorphins and other substances to stop pain signals to the brain

Case Study

- 8 year old girl with VACTERL, who presented with chronic low back pain
- Described pain as achy, had trouble sitting for prolonged periods at school
- Initially started on ibuprofen for pain, as well as gabapentin
- Changed seating to a gel beanbag chair at school to help with pain
- MRI done showing par interarticularis defect – patient placed in a corset brace
- Pain started worsening at night, waking her several times a night
  - Parents tried massage
  - Motrin, Tylenol both prn, gabapentin at bedtime

Case Study

- Pain persisted
- Anxiety noted on clinical questioning. Had anxiety particularly in medical settings. Got set up with psychology, got placed on Prozac and atarax at bedtime by developmental peds.
- Pain persisted
- Trial of norco 2.5mg po qhs, referral to pain center for possible interventional treatment (nerve block, etc)
- Pain center switched patient to lyrica from gabapentin, started her on a topical compounded cream

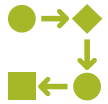
Case Study

- Pain persisted
- Started on a tens unit, started in PT
- Second opinion re: pain/MRI findings at Shriner's Hospital, recommended drainage of pars cyst noted on MRI
- Pars Cyst drainage by interventional radiology → pain improved, able to sit for longer periods of time
- Oxycodone used less at night and eventually weaned off
- Able to attend school, spent summer swimming and riding her bike with friends
- Remains stable on lyrica, motrin prn, topical pain cream prn

Chronic Pain Management Dos

Do set up clear expectations from the start

Do utilize a pain contract



Do see patient's monthly to assess improvements, need for changes to plan

Do assess pain score, but more importantly assess their function

Do agree on who will prescribe which meds

Do check OARRS report with every visit when prescribing lyrica, opioids

Do place intranasal narcan in the home if utilizing opioids for pain management

Do trust your gut if something seems off/not right

Marijuana and Chronic Pain

The cannabis plant can produce at least 144 naturally occurring compounds known as cannabinoids, including THC and cannabidiol

High levels of cannabinoid receptors are found in the brain – cortex, hippocampus, amygdala, basal ganglia, cerebellum and emetic centers

Medical Marijuana and Chronic Pain Management

- Several studies have demonstrated the effectiveness of medical marijuana in chronic and neuropathic pain

Medical Marijuana

- Many reports indicated the medical marijuana has improved treatment of chronic pain
- Therapeutic benefits of THC noted in the management of: spasticity related to multiple sclerosis, HIV associated sensory neuropathy, and chronic neuropathic pain
- Clinical trial showed that smoking cannabis (4-32mg THC) reduced pain intensity
- Another study – up to 25mg THC reduces pain as compared to placebo

Medical Marijuana

- Pergolizzi et al found that cannabis is effective in controlling neuropathic pain, allodynia, medication rebound headache, and chronic non-cancer pain, but NO benefit over opioids in treating acute pain
- Benefits of medical cannabis are bordering on clinically meaningful with 0.4-0.8 point improvement on numerical pain scale and a significant reduction in pain – up to 30%
- Limited to neuropathic pain
- For other types of pain, no clear benefit in comparison with placebo: cancer pain, rheumatoid arthritis, fibromyalgia, visceral pain, musculoskeletal pain and chronic pancreatitis

Concerns re: Medical Marijuana

Most frequently reported adverse effects are that of the central nervous system

- Psychosis and cognitive impairment
- Gastrointestinal
  - Dry mouth, nausea, vomiting, and cannabinoid hyperemesis syndrome

Whiting et al showed that there was a higher incidence of non-serious adverse effects in patient receiving medical cannabis after 1 year

Another study showed that an average dose of 2.5 grams per day was safe for patients using cannabis for pain management

Concerns re: Medical Marijuana

- Higher risk of adverse cognitive effects with long term use
- Impairments in executive function including memory and psychomotor speed
- Long term use or accidental overdose can lead to cannabinoid hyperemesis syndrome – severe episodes of cyclical vomiting associated with abdominal pain
- According to the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) the cumulative probability that the use of cannabis was linked to a lifelong risk of dependence was 9% compared to the 67.5% risk with nicotine and alcohol which is 22.7%

Medical Marijuana

- Schedule I drug – no acceptable medical use
- However, 38 states, District of Columbia, and 3 US territories all allow its use
- Physicians cannot PRESCRIBE marijuana
- Physicians can RECOMMEND medical cannabis to treat a variety of conditions
- To do the this the physician must be:
  - Registered with the Department of Health
  - Have a valid medical license
  - Must determine that the patient has a serious medical condition
- Physician can make a recommendation for medical cannabis that the patient can take to a dispensary to have filled

Medical Marijuana is Approved to Treat in Ohio

•AIDS	•amyotrophic lateral sclerosis
•Alzheimer’s disease	•cachexia
•cancer	•chronic traumatic encephalopathy
•Crohn’s disease	•epilepsy or another seizure disorder
•fibromyalgia	•glaucoma
•hepatitis C	•Huntington's disease
•inflammatory bowel disease	•irritable bowel syndrome
•multiple sclerosis	•pain that is either chronic and severe or intractable
•Parkinson's disease	•positive status for HIV
•post-traumatic stress disorder	•sickle cell anemia
•spasticity	•spinal cord disease or injury
•terminal illness	•Tourette syndrome
•traumatic brain injury	• ulcerative colitis

How Does A Patient Obtain Medical Marijuana/Medical Marijuana Card?

- Patient must see a physician who is certified recommend medical marijuana
- Must be an Ohio resident with proof of residence
- Must have a diagnosis of one of the qualifying medical conditions
- Must obtain recommendation, fill out application form, and submit along with government issued ID (for a minor, will accept use of the parents ID)
- Physician creates a profile for the patient in the Patient and Caregiver Registry
- Once card is received, patient can purchase medical cannabis from approved dispensary

Case Study

- 15 year old female with hypoxic ischemic encephalopathy and spastic cerebral palsy
- Pain was refractory to baclofen, botox injections, and nerve blocks
- Spasticity was so severe, she was unable to close her mouth completely (struggled to eat and express herself verbally)
- Additionally had poor sleep and anxiety
- After 4 months of treatment, had the ability to chew, laugh, and smile. Improved anxiety, improved tone, was able to wean down on gabapentin

Case Study

- At 8 month follow up, had undergone posterior spinal fusion
- Oxycodone being weaned, and medical cannabis being used somewhat inconsistently due to sleepiness from oxycodone and product availability at dispensary was inconsistent
- Upon running out, and being off of it for some time, her mother did notice a distinct change to this patient's quality of life


IN A GREAT DEAL OF HORRIFIC, TRULY INSANE CHRONIC PAIN ON ALL LEVELS.
STILL CUTE ENOUGH TO GET AWAY WITH LETTING PEOPLE HELP RELIEVE SUCH PAIN

QUESTIONS?

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