Pain Management in Patients with Chronic Kidney Disease

Randy Chen, M.D.
Thanks to our speaker!

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Pain Is a Big Problem!

- Pain affects more than 100 million people in the U.S.
- Pain-related costs are over $100 billion dollars in the U.S.
- Pain-related expenditures are more than those for diabetes, heart disease, and cancer COMBINED.
- The opioid epidemic has taken thousands of lives (130 lives daily), and causes an economic burden of over $78 billion dollars a year.
- Understanding and effectively treating pain is difficult.
What Causes Pain?

- Nerve fibers, chemicals, and the brain are all involved in this process.
- Pain receptors get activated by different stimuli.
- Nerves are like cables that send the signal to the brain.
- The brain will interpret this signal as pain.

Image source: Arthritis Foundation
Why Do We Have Pain?

- It is our bodies way of telling us something is not right and that we should be aware of this.
- If we are injuring our bodies, we should know this. If I touch a hot stove, my brain tells me, “you better move your hand or it will burn.”
- If our organs are not doing well, there is a problem and sensing pain is an important signal. A heart attack will cause you pain in the chest.
Why Do We Have Pain? Why is Pain More Common in People with Kidney Disease?

• Pain is more common in CKD patients than in the general population. Over 60% of hemodialysis patients describe moderate or severe chronic pain (Davison, 2019)
• Half of dialysis patients experience moderate or severe pain (Santoro et al., 2012) and (Raina et al., 2018)
• Dialysis can cause inflammation with the process of cleaning blood and worsen overall pain in the body.
Common Sources of Pain in Kidney Disease and in Dialysis Patients

- Neuropathy
- Gout
- Needle insertion into dialysis access
- Metabolic bone disease
- Inflammation caused by the process of dialysis
When Pain is Hurtful?

- It always hurts. It is our bodies telling us that something is wrong.
- Sometimes our emotions will make this worse and we will interpret the pain as severe.
- When it starts to affect life and ability to do things, it can be devastating.
- We have ways to make the pain more bearable.
Types of Pain

- **Nocioceptive (mechanical) pain**: Described as throbbing, pressure, dull, or cramping.

- **Neuropathic (nerve) pain**: Described as tingling, numbness, burning, or stabbing.

- Getting a better idea of the quality of pain is important for making a diagnosis and treatment plan.
Examples of Types of Pain in Kidney Disease

- **Musculoskeletal pain**: Pain in the muscles, bones and joints
  - Example: osteoarthritis

- **Inflammatory pain**: Increased sensitivity caused by inflammation
  - Example: infection, gout

- **Mechanical pain**: Pain from masses or compression
  - Example: kidney stone

- **Neuropathic pain**: Nerve pain
  - Example: sciatica, shingles, diabetic neuropathy (burning feet)
Visceral Pain

• Every organ in the body has pain receptors.
• The intestines, heart, lungs, and kidneys can all sense pain.
• Your skin is an organ and has a significant amount of pain receptors.
• You feel pain when mechanical causes, inflammation, or injury affect an organ.
• This is a way to tell that something is not right internally.
Referred Pain

- Organ pain can be sensed in parts of the body you may not expect.
- This pain seems like it may be coming from somewhere else.
Acute Versus Chronic Pain

- **Acute pain**: Sudden onset and usually caused by some process that triggers it then goes away. Tells the body to react and avoid injury.
  - Example: touching a hot stove or stepping on a nail.

- **Chronic pain**: Usually a result of constant nerve stimulation with injury or inflammation of the nerve.
  - Example: Diabetic neuropathy and chronic lower back pain. Longstanding mechanical pain such as arthritis.

Image source: Military Health System
When a Care Provider Asks Questions About the Type of Pain You Are Having...

- They are trying to get to the root cause of your pain and what is causing your pain by getting a good history.
- They can examine you to see if you have inflammation or something specific causing your pain or if it is from nerve injury.
- This can lead to further examinations or testing if necessary such as blood tests or X-rays.
- They can figure out what would be good treatments, e.g. medications, local therapy (heat or ice).
Medications for Mechanical (Nocioceptive) Pain

• **Non-anti-inflammatory**: acetaminophen, opioids (narcotics)

• **Anti-inflammatory**: NSAID’s (ibuprofen, meloxicam), COX-2 inhibitors (celecoxib), steroids (prednisone)

• **Topical agents**: lidocaine, capsaicin cream, topical NSAID’s (diclofenac gel)

AKF does not endorse any particular brand, inclusion of any brand is for reference example.
Caution with NSAID and COX-2 Inhibitors

- **Non-steroidal anti-inflammatory drugs** or NSAID’s can cause kidney injury if used heavily or long-term, it is recommended that patients with kidney disease avoid using NSAID’s.
  - Ibuprofen: MOTRIN®, Advil®
  - Naproxen sodium: Aleve®, Naproxen (Naprosyn)
  - Celecoxib: Celebrex®
  - Other NSAID’s: meloxicam (Mobic®), diclofenac (Voltaren®), indomethacin (Indocin®)

- Sometimes, the kidney injury is temporary and sometimes it’s permanent. But the risk is high for injury in patients with kidney disease.

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Medications for Nerve (Neuropathic) Pain

• Gabapentin (Neurontin®)
• Tricyclic Antidepressants
  – Example: amitriptyline (Elavil®)
• Anti-depressants
  – Example: duloxetine (Cymbalta®)

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Why should you manage your pain?

- Overall better quality of life
- Being able to do physical activities you enjoy
- Improved mental health
- Improved sleep patterns
- Higher survival rate
Gabapentin

- Very commonly prescribed for nerve pain.
- Works in the brain and interferes with the signals that the brain interprets as pain. How it works is complicated and not completely known.
- It has been shown to be effective in such things as diabetic neuropathy and shingles pain.
Cannabis Products

• Cannabis or marijuana products have gained some popularity in pain management.
• There is ongoing research into the use of CBD oil as a treatment for pain.
• Good research studies have not yet been performed or verified in kidney disease patients.
• The lack of quality assurance and FDA regulation makes getting a quality product difficult.
Narcotics and Opioids

• Can be very effective for pain control in acute and chronic pain.
• Addiction and abuse potential is a huge concern.
• Can accumulate and the physical side effects such as low blood pressure, constipation, depression of respiratory drive can be magnified.
• Narcotic analgesics can cause a person to feel high and this can be magnified in patients with kidney disease as the drug can accumulate.
• In general, it is safest to start at a low dose and gradually increase the dose and frequency to avoid unwanted effects.
• Some medications can be dialyzed and some cannot.
Narcotic Pain Medicine cont.

• Shorter acting medicine such as fentanyl may be a better idea than longer-acting medicine since kidney disease patients can have issues with eliminating long-acting medicine from the body.

• Tramadol is a good consideration but not as effective as other narcotic analgesics for pain control.
Topical Analgesics

- Causes cooling or heating feelings and help to decrease the sensation of pain.
  - Example: BENGAY®
- Reduce substance P and decrease the pain transmission signal.
  - Example: Capsaicin
- Cause direct anesthetic effects and decrease nerve conduction.
  - Example: Lidocaine
- Anti-inflammatory effect to reduce the inflammation process.
  - Example: diclofenac gel, cream

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Hot and Cold RICE

- **Rest, Ice, Compression, Elevation** or RICE can help musculoskeletal injury.
- When inflammation is the key process, **cold** is likely a better idea as it decreases circulation to that part of the body.
- When getting better circulation and helping to relax muscles is key, **heat** may help.
- Compression can help to decrease the tissue swelling.
Considerations for Pain for Patients with Kidney Disease

- Medications adjustments often need to be made because many medications are eliminated by the kidneys. So, they may last longer in the body or need a less potent dose.
- It is often best to start low and go slow when adjusting medications.
- NSAID's are generally not favored in patients with kidney disease as they have a high risk of kidney injury.
- Many medications have a ceiling effect and may not relieve the pain well enough.
- Many medications can be dialyzed and removed from the body and so the effect may wear off during dialysis.
Pain with Needle Cannulation of Dialysis Access

- The needles used in dialysis cannulation of access are very large and can really hurt.
- Use of topical analgesics 30 minutes prior to needle insertion can numb the pain (lidocaine or EMLA® cream)
- Local injection of lidocaine or similar local anesthetics can numb the area where a needle is inserted.
- Over time, the area where the needle is inserted can become less sensitive to pain.
Reducing Somatic Pain with Ergonomics

- Neck and back pain is common. Cervical and lumbar support may help reduce pain and strain.
  - Neck pillows
  - Lumbar support or pillow
  - Good bed
- Stretching and exercise can help support the spine and body.
- Use ergonomic chairs and desks for prolonged sitting.
- Maintain good posture.
Procedures and Surgeries

- Epidural injections into the spine to deaden nerves
- Steroid injections into a joint space or area to decrease inflammation
- Botulinum toxin to decrease muscle tension
- Surgical decompression or others to decrease mechanical compression on a nerve
- Removing a mass or organ to decrease mechanical pain
Pain Specialists and Complementary Treatments

- If traditional treatments are not effective, it may be best to have a pain specialist who can help to manage pain syndromes.
- There may be other therapies such as acupuncture and electrotherapy that may be of help.
Pain Management Challenges

• The sensation of pain is a complex interplay of nerves, chemicals, and the brain.
• There are many types of pain and figuring out where it is coming from can be challenging.
• Pain control will likely take a number of different therapies and approaches. So don’t give up!
Questions?
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