Neuropathic Pain vs Vascular Pain in the Diabetic Patients

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Disclosures

None...
“Pain has an element of blank; It cannot recollect When it began, or if there were A day when it was not.”
--Emily Dickinson
Objectives

• Statistics & Definitions
• Differentiate the Variable TYPES of Pain
• Understanding DFU Pain Management
Pain is Major Public Health Issue

**Chronic Pain affects:**
100 million patients in US annually
More pain patients than diabetes, cardiac disease and cancer combined

**Annual costs:**
$560 to $635 billion in medical treatments and lost productivity

**Pain is a major driver of visits to clinicians:**
Despite recent advances, there are still many gaps in our knowledge of pain

Incidence of Pain

Percent Estimated Incidence

- Pain: 26%
- Diabetes: 7%
- Coronary Heart Disease & Stroke: 6%
- Cancer: 0.4%

Pain – 76.2 M
National Centers for Health Statistics

Diabetes – 20.8 M
American Diabetes Association
(diagnosed/est. undiagnosed)

Coronary Heart Disease – 18.7 M
American Heart Association
(heart attack, chest pain and CVA)

Cancer – 1.4 M
American Cancer Society

Incidence of pain, as compared to major conditions. http://www.painfoundation.org/media/resources/pain-facts-figures.html.
Impact of Quality of Life

% Unable to Perform

Exercise: 81%
Sleep: 79%
Hobbies: 67%
Chores: 65%
Socialize: 65%
Walking: 59%
Concentrate: 49%
Relationships: 41%
Work: 31%
Childcare: 20%

Source: American Pain Society Chronic Pain Patient Survey
“Pain truly is the gift nobody wants…
I can think of nothing **more precious** for those who suffer from congenital painlessness…
People who already own this gift rarely value it…usually they resent it”

- Dr. Paul Brandt
Definition of Pain

“An unpleasant sensory & emotional experience associated with actual or potential tissue damage or prescribed in terms of such damage.”
Acute Pain Management Guideline Panel, 1992

“Pain is also defined as whatever the experiencing person says it is and exists whenever he says it does”
McCaffery, 1999

This is a more Subjective Overview and also accepted as the basis for pain assessment & management by both JCAHO & American Pain Society
Abnormal Pain States

• **Allodynia**
  • Pain response to non-noxious stimuli

• **Hyperalgesia**
  • Exaggerated or spontaneous response to noxious stimuli

• **Neuropathic Pain**
  • Persistent, intense burning pain due to direct injury to peripheral nerve or central neurons
# Types of Pain

<table>
<thead>
<tr>
<th><strong>NOCICEPTIVE</strong></th>
<th><strong>NEUROPATHIC</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>This can result from ongoing activation of primary afferent neurons by noxious stimuli</td>
<td>This is a result of abnormal processing of the sensory input by the peripheral or CNS</td>
</tr>
<tr>
<td>Two Subtypes:</td>
<td>Two Subtypes:</td>
</tr>
<tr>
<td>Somatic</td>
<td>Constant</td>
</tr>
<tr>
<td>Visceral</td>
<td>Intermittent</td>
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**Key component is that with Nociceptive Pain the Nervous System is INTACT**

** Key component is that with neuropathic Pain the Nervous System is affected and NOT Fully Intact**
Nociceptive Pain

**Somatic**
- This Pain arises from:
  - Bone
  - Skin
  - Muscle
  - Connective Tissue
- Description of pain:
  - Aching
  - Throbbing
  - Well-Localized - Incision

**Visceral**
- This Pain arises from:
  - Visceral Organs
    - Gut
    - Small Bowel
- Description of Pain:
  - Cramping
  - Diffuse Pain
  - Poorly localized
    - Small bowel obstruction

**Vascular Pain**
MANAGED well with Non-Opioids & Opioids

MANAGED well with Non-Opioids & Opioids
Neuropathic Pain

• The Diagnosis of Neuropathic Pain is made CLINICALLY by interpreting the results of Negative & Positive clinical findings.

• It is Helpful to also include a questionnaire such as the Neuropathic Pain Scale (NPS)

Description of Pain:

• Burning
• Stabbing
• Electrical (Diabetic Ulcer/ Shingles)

PAIN MANAGEMENT: Responds better to TCA / Anticonvulsants

• Gabapentin or Pregabalin Specific for Painful Diabetic Neuropathy
• NOT Opioids & Non Opioids
Differentiating Vascular vs Neopathic
Differentiating Vascular vs Neopathic

- **Recognize at Risk Patients**
  - Older adults are at greater risk for developing neuropathic pain because of fewer inhibitory nerves, lower endorphin levels and a slowed capacity to reverse processes that sensitize nerves.

- **Use Tools**
  - Those that combine self-report and physical examination are more precise than self-report alone.

- **DN4**
  - Comprised of 10 items
    - 7 symptoms and 3 clinical examinations
  - Each item equally weighted with a score of 4 or more classifying the pain as neuropathic.
  - Sensitivity (83%) and Specificity (90%).

## DN4 Questionnaire

<table>
<thead>
<tr>
<th>Symptom / Sign</th>
<th>Yes = 1</th>
<th>No = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the pain have the following characteristic? Burning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the pain have the following characteristic? Painful cold?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the pain have the following characteristic? Electric shocks?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the area of pain also have the following? Tingling?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the area of pain also have the following? Pins &amp; needles?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the area of pain also have the following? Numbness?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the area of pain also have the following? Itching?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exam: Decrease in touch sensation (soft brush)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exam: Decrease in prick sensation (von Frey hair #13)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exam: Does movement of a soft brush in the area cause or increase pain?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0 – 3 = likely nociceptive pain ≥4 = likely neuropathic pain

Total:

Differentiating Vascular vs Neopathic

- History
  - Pain description
  - Duration, Location, Exacerbating factors

- Physical Exam
  - Wound Exam
Differentiating Vascular vs Neopathic

- **History**
  - Pain description
  - Duration, Location, Exacerbating factors

- **Physical Exam**
  - Wound Exam
  - Test for neuropathy
Semmes Weinstein Monofilament
Differentiating Vascular vs Neopathic

• History
  • Pain description
  • Duration, Location, Exacerbating factors

• Physical Exam
  • Wound Exam
  • Test for neuropathy
  • Don’t forget a Detailed Vascular Exam
More than two thirds of the patients within the study group with evidence PAD had a palpable pulse!
Differentiating Vascular vs Neopathic

- **History**
  - Pain description
  - Duration, Location, Exacerbating factors

- **Physical Exam**
  - Wound Exam
  - Test for neuropathy
  - Don’t forget a Detailed Vascular Exam

- **Rate Pain**

- **Follow-up**
Many patients can exhibit both the Nociceptive and Persistent Neuropathic Pain Pictures.

This can be caused by both Acute Injury and Secondary effects

Must pay attention to Acute Onset of pain that may be masked under persistent pain
  • Arthritis, Spinal Stenosis, DJD
  • Musculoskeletal Disease States

Remember a Persistent Pain can overlap a new acute problem
  • Fracture, Ischemic episode, infection etc
Pain Management

WHO Pain Relief Ladder

Step 3
- Opioid for moderate to severe pain
  ± Non-opioid
  ± Adjuvant

Step 2
- Opioid for mild to moderate pain
  ± Non-opioid
  ± Adjuvant

Step 1
- Non-opioid
  ± Adjuvant
WHO Analgesic Ladder

Step 1: Non-Opioid Analgesics
- Pain scale between 1-3
- Acetaminophen/NSAIDS, TCA, Antiemetics/Sedatives

Step 2: Opioid Analgesics
- Pain Scale 4-7 Mild to Moderate Pain
- Weak Opioids (Tylenol #3) with NSAIDS combo

Step 3: Opioid Analgesics
- Pain scale between 7-10 Moderate to Severe Pain
- Strong Opioids (Morphine & Morphine like Agents)
Adjuvant Agents

- Drug Classes:
  - Tricyclic Antidepressants
    - Amitryptiline
  - Anticonvulsants
    - Gabapentin
    - Pregabalin
    - Valproic Acid
  - Systemic Local Anesthetics
    - Lidocaine
    - Mexiletene
  - Topical Anesthetics
    - Capsaicin
    - EMLA
    - Lidocaine Gel, 1% 4%

NSAIDS & other Non-Opioids

- NSAIDS:
  - Ibuprofen
  - Celecoxib
  - Ketorolac
  - Rofecoxib
  - Salsalate

- Other Non-Opioids:
  - Acetaminophen
  - ASA
  - Tramadol
Weak Opioids
Combination Preparations

- Acetaminophen with Codeine (Tylenol #3)
- Hydrocodone with Acetaminophen (Vicodin)
- Oxycodone with Acetaminophen (Percocet)
- Propoxyphene
- Propoxyphene with Acetaminophen

Opioids: Morphine and Morphine-like Agents

- Morphine
- Dolophine
- Fentanyl Patch
- Levorphanol
- Oxycodone
Wound Pain is most effectively managed via Pharmacologic Modalities but the use of other treatments is gaining favor:

- Many of the Nonpharmacologic Modalities can be used in conjunction with pharmacologic regimens or prior to starting. Some most often used include:
  - PT and OT
  - Use of Music
  - Massage Therapy
  - Relaxation Techniques
  - Pulsed Radio Frequency Energy
Pharmaconutritional

- Growing evidence to support the combination of Pharmaconutritional therapy with other modalities
  - L-Methylfolate
  - Methylcobalamin
  - Pyridoxal 5’- Phosphate

- Mechanism of Action
  - Increased bioavailability of Nitric Oxide
    - Enhanced activity of eNOS (endothelial NO synthase)
    - Decrease in oxidative stress
    - Myelin and nerve regeneration
Epidermal Nerve Fiber Density

Clinical Outcomes

Patient received baseline skin punch biopsy and given Metanx twice daily and followed for 6 months. Image 8(a) represents baseline skin punch biopsy at left calf. Image 8(b) represents 6 month follow up skin punch biopsy at left calf. Patient averaged an increase of 3.75 nerve fibers per mm. Skin punch biopsy analysis and images performed by Theraphan, L.L.C.

The mean ENFD of the 11 participants was 1.56 fibers/mm and 3.07 fibers/mm after approximately 6 months of Metanx, representing a

97% INCREASE in ENFD (p=0.004)

• Assess the Patient… Subjective AND Objective
• Pain is what THE PATIENT says it is
• Consider Mixed Pain Syndromes
• Don’t forget a Thorough Vascular Examination
Thank You
To Show My Appreciation...

- For listening to my presentation
- For your attentiveness and insightful questions
- For you rating my presentation with “all 5’s” on your evaluation forms
This educational activity is endorsed by the American College of Hyperbaric Medicine & American Professional Wound Care Association
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