Understanding and Managing Pain in Neurodegenerative Diseases
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11:00:00 AM-1:00 PM

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Pain is defined as “An unpleasant sensory or emotional experience that is associated with actual or potential tissue damaging stimuli.”

- International Association for the Study of Pain

Session Objectives:
1. Describe and review the current evidence from animal models and clinical research that supports how exercise induces analgesia and the prevalence and clinical features of pain in patients with neurodegenerative diseases.
2. Describe the fundamental aspects of pain neurobiology and appropriate clinical assessment tools that are needed to guide treatment of patients with neurodegenerative diseases.
3. Describe the non-pharmacological and pharmacological medical management of musculoskeletal, neuropathic, and dystonic pain in neurodegenerative diseases.
4. Identify successful physical therapy approaches for pain in patients with neurodegenerative diseases (MS, PD, HD, AD) and indications for referral or consultation to various healthcare professionals.

What is the prevalence and clinical features of pain in neurodegenerative diseases?
1. Types of pain in patients with neurodegenerative disease
   a. Nociceptive
   b. Neuropathic
   c. Dystonic/mixed
2. Prevalence of types of pain and clinical features in Parkinson disease, Alzheimer’s, Multiple Sclerosis and Huntington’s disease

Pain assessments and unique considerations for patients with neurodegenerative disease
1. Techniques for pain assessment
   a. Self-report
   b. PainDETECT
   c. Brief Pain Inventory
   d. Short-form McGill
   e. DN4 Questionnaire
   f. Leeds Assessment of Neuropathic Symptoms and Signs (LANSS Pain Scale)

Will focus on these tools
g. Neuropathic Pain Questionnaire
2. Efficiency of use of tools available
3. Alternative types of tools and evaluation techniques for measuring pain
4. Importance of utilization

**Neurobiology of pain in patients with neurodegenerative disease**
1. Pathoanatomical mechanisms
   a. Peripheral mechanisms - musculoskeletal/ nociceptive pain
   b. Central mechanisms – central neuropathic pain
   c. Neuronal damage with direct and/or indirect impact on pain processing areas:
      clinical evidence for loss of descending pain modulation
2. Pathophysiological / neurochemical mechanisms
   a. Immune system dysregulation
   b. Altered neurotransmitters – the role of dopamine depletion in pain modulation

**What do animal models and clinical research tell us about exercise-induced analgesia?**
1. Mechanisms of exercise-induced analgesia
   a. Peripheral mechanisms: immune system modulation
   b. Central mechanisms: reduction in central excitability and increased central inhibition
2. Clinical evidence for exercise-induced analgesia in musculoskeletal and neurological conditions
3. Implementation of exercise in musculoskeletal and neurological conditions

**Condition specific considerations for assessment and treatment**
1. Parkinson disease and Multiple Sclerosis
   a. Types of pain
   b. Relationship of pain to other symptoms (i.e., cognition, on/off time of medications, quality of life, and other aspects to include in evaluation)
   c. Diagnosis specific pain assessments
   d. Treatment (non-pharmacological) for pain
   e. Highlight special considerations

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<thead>
<tr>
<th>Treatment</th>
<th>Results</th>
<th>Type of study</th>
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<tbody>
<tr>
<td>Therapeutic Exercise</td>
<td>Reduces pain in: MS, Back pain, PD</td>
<td>Non-homogenous systematic review, RCT, Case series</td>
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<td>Exercise with proprioceptive re-education</td>
<td>Reduces neck pain in: MS</td>
<td>Non-homogenous systematic review</td>
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<td>TENS</td>
<td>Decrease pain and increase functionality in people with chronic low back pain</td>
<td>RCT</td>
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<td>Reduces central pain in MS</td>
<td>Systematic Review, RCT</td>
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<td>Assistive device</td>
<td>Prevents pain from immobility in ALS</td>
<td>Invited review</td>
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<td>Visual Imagery</td>
<td>Reduces neuropathic pain SCI and PD</td>
<td>Double blind trails</td>
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<td>Orthotics</td>
<td>Reduces joint pain in MS and ALS</td>
<td>RCT, Invited review</td>
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2. Alzheimer’s disease and Huntington’s disease
   a. Overview of types of pain, relationship with other symptoms and treatments.
3.  Team management of pain

a. Cost-effectiveness of interdisciplinary treatments for chronic pain conditions

4. Case Study

**What do patients care about? Promoting patient engagement**

1. Patient engagement through self-management programs and education
2. The role of the PT to promote patient engagement and the role of education within a comprehensive PT plan of care

**Panel discussion:** Question and answer, clinical application, and future directions

**References and Resources**


