Michigan Pediatric Adolescent Interdisciplinary Network
MIPAIN
Desensitization – Does it work for the chronic pain population?
Pediatric Rehabilitation Center
Presented By:
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What We Will Be Covering:

• Brief overview of the MiPain program
• Quick review of amplified musculoskeletal pain syndrome (AMPS)
• Desensitization key terms
• Current evidence for desensitization and treatment approaches
• Assessments
• Strategies for implementation of a desensitization protocol
• Case study example
MiPAIN program:

- 4 kids in a group ages 9-21
- 3 days a week: Tuesday, Wednesday, Thursday
- 9am - 3pm
- 3 weeks
- 1 session cancelation policy

Occupational therapy frequency:

- 3 sixty minute sessions a week
  - ⅔ group of 4 format. ⅓ group of 2 format.
Pediatric Chronic Pain Epidemiology

Completely changes their life

Before Pain

Lots of room for activities

After Pain

Little room for activities

NORMAL EXCITED LEVEL

FIRING LEVEL

EXTRA SENSITIVE

NORMAL EXCITED LEVEL
Key Terms

- **Allodynia[^4]:**
  - painful response to generally non-painful stimuli
  - example: clothing, bed sheets

- **Hyperalgesia[^4]:**
  - heightened pain response to generally painful stimuli
  - example: deep pressure, injuries

- **Hyperesthesia[^4]:**
  - general hypersensitivity to any sensory stimuli
Allodynia vs. Hyperalgesia

Statistics

- 15%-50% of all individuals with neuropathic pain, experience allodynia[^16]
- 74% of adult patients with complex regional pain syndrome experience allodynia[^13]
- 76% of children with CRPS experience allodynia[^14]
Current Evidence

- The Effectiveness of Desensitization Therapy for Individuals with Complex Regional Pain Syndrome: A Systematic Review\(^1\)
  - Examined effect of desensitization in patients with CRPS
  - 10 articles included (2001-2013)
  - Types of desensitization:
    - chemical, tactile, thermal, and pressure desensitization
    - tactile was most prevalent
  - 68 patients total
  - Ages: 8-57
Current Evidence

● The Effectiveness of Desensitization Therapy for Individuals with Complex Regional Pain Syndrome: A Systematic Review[1]
  ○ Only one study examined the effects of tactile desensitization in isolation
  ○ Outcome measures included:
    ■ pain, allodynia, and/or function
  ○ Results:
    ■ All studies showed support of including desensitization as a part of the treatment approach for CRPS.
    ■ Supported a graded desensitization approach
Current Evidence

- Highlights from literature
  - Evidence supporting use of desensitization used in combination with motor tasks for CRPS \(^{[12]}\).
  - Patients with increased allodynia tended to have decreased tactile discrimination in the affected area \(^{[3]}\).
  - Evidence shows shrinkage of cortical maps on primary somatosensory cortex (SI) on the contralateral side to the limb affected with CRPS. Amount of shrinkage linked to severity of pain \(^{[3]}\).
  - Combined graded desensitization and motor tasks led to a decrease in pain, improvement in tactile discrimination, and restoration of cortical maps in patients with UE pain and hypersensitivity due to CRPS \(^{[3]}\).
Current Evidence

- Highlights from literature:
  - Graded approach with regards to both the texture used and the motor task performed\(^3\)\[^{12}\]
  - Following desensitization, patient’s demonstrated decreased size of allodynic region.\(^2\).
  - Decrease in patient’s pain intensity following desensitization protocol\(^2\)\(^{12}\).
Graded Motor Imagery

**Stage 1**, participants see a series of photographic flash cards, and are asked to identify (as quickly as possible) whether the depiction is of a left or right limb. **Stage 2**, participants imagine moving the affected limb into the position demonstrated on the photograph, while the affected hand rests comfortably. **Stage 3** involves mirror therapy, whereby both limbs are moved to adopt simple postures as demonstrated on the photograph [20]

Graded Motor Imagery

“It seems plausible that GMI may provide an avenue to start rehabilitation at a manageable level for a patient who complains that pain is too severe to perform any kind of limb movement.” p[19]

Allodynia Hypersensitivity Scale

- No standardized measure was identified to assess tactile hypersensitivity
- Allodynia and Hypersensitivity Scale was created to meet the needs of the MiPain program.
- Only completed if patient is hypersensitive to tactile stimulation
- Implemented using a standardized protocol
- Overall, data collection shows that patients exit with reduced tactile hypersensitivity.
## Allodynia Hypersensitivity Scale

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Allodynia Hypersensitivity Scale findings:

- Based upon change in score from initial evaluation until the end of the MiPain program.
- 30 patients’ scores were included
- Average decrease of 10.3 points
- High of 37 point decrease.
- 2 patients scored higher on post-test than pre-test
Standardized Assessment Considerations:

- Two-point discrimination
- Pain perception questionnaires (BATH, etc.)
- Measuring size of pain region
- Pressure gauge
Patient Factors to Consider

- How do we know if the patient is a good candidate for a desensitization protocol?
- Which protocol should you choose?
Strategies for Implementation

- Graded progression based upon patient’s tolerance
  - variation in textures used
- Used in combination with movement/exercise
- Embedded within functional activities and routines
  - shower
  - dressing (i.e clothing textures)
- Individualized home exercise program
  - at least 1-8 minutes of daily desensitization multiple times a day.
- Involvement of caregivers for improved carryover
Case Study Example

● Patient demographics
  ○ 9 years old
  ○ Complex regional pain syndrome
  ○ Left lower extremity pain and hypersensitivity
  ○ high level athlete

● Initial evaluation:
  ○ using crutches
  ○ Allodynia Hypersensitivity Scale: score 56
  ○ minimal physical activity
  ○ occasionally missing school or leaving early
  ○ often avoids washing LLE in shower
  ○ could not sit with knee flexed at 90 degrees
Case Study Example

- Treatment approach:
  - Coordinated outpatient OT, PT, and Psychology
  - Frequency: 2-3x/week
  - Interventions included:
    - movement
    - weight bearing
    - desensitization
    - functional activities
    - mirror visual feedback
    - scheduled decrease in use of crutches
Case Study Example

- Self Administered Desensitization included:
  - shaving cream
  - dry towel
  - wet towel
  - soft brush
  - sensory brush
  - textured massage roller
  - vibration

- Incorporated mirror visual feedback with these textures on non-affected LE

- Textures were graded up based upon tolerance

- Included both patient and therapist completing desensitization during session
Case Study Example

● Outcomes
  ○ Allodynia Hypersensitivity Scale re-assessment score: 33
    ■ Improved by 23 points
  ○ Ambulating without upper extremity support
  ○ Independent with all ADL’s
  ○ Increased activity levels
References


References


References

[18] International Spine & Pain Institute - Session 1-4