Management of Complex Regional Pain Syndrome in the Pediatric Patient

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**PICO question**
What is the difference in the outcome of pain management in children with complex regional pain syndrome between physical therapy and analgesic medication?

**What is CRPS?**
Complex Regional Pain Syndrome

- Relatively recent pediatric diagnosis
- Impact on all tissues and can impair all function of that extremity
- genesis is hypothesized to be possibly a multitude of factors, including:
  - A psychological predisposition to syndrome
  - Inactivity
  - Increased sympathetic activity
  - Exaggerated inflammatory response
  - Therapy resistant pain
- Sometimes not recognized in children because it can present differently than in adults
- Average diagnosis early adolescents, age range of 2-17
- In a retrospective study 67 out of 78 (85%) were female
- Average diagnosis time 41 weeks in a study

**CRPS Symptoms**
- Extreme pain including:
  - Allodynia
  - Hyperesthesia
  - Paresthesia
- Skin color changes
- Temperature changes
- Swelling
- Decreased ROM
- Muscular guarding
- Muscle atrophy
- Altered perspiration
- Trophic changes in skin and nails

**Symptoms Compared to adults**

- **Age**
  - Adult 45
  - Pediatric 12
- **Gender ratio**
  - Male predominant
  - Female predominant
- **Extremity affected**
  - Upper
  - Lower
- **Trauma**
  - Mild-severe
  - Moderate-severe
- **Limb temperature**
  - 35% cooler
  - 75% cooler
- **Pain**
  - 40%
  - 7%
- **Progress**
  - Variable, long-term
  - Excellent recovery in most cases
- **Elevation**
  - 10%
  - 3%

*Mean age at presentation of the symptoms.

**How is CRPS currently managed?**
- Treatment usually consist of:
  - Active physical therapy
  - Psychological therapy
  - Pain relieving measure such as:
    - Pharmacotherapy, sympathetic block and spinal analgesia
- Drugs used:
  - NSAIDS
  - Opiates
  - Antidepressants
  - Gabapentin
  - Benzodiazepines
  - Oral Steroids
  - Local Injections
  - Sympathetic nerve block
  - Epidural Injection
- Casting and Splinting

**Physical Therapy Interventions**
- Physical therapist must coach patient through some pain
- The PT treatment program was individualized for each participant
- Specific modalities included:
  - Transcutaneous electrical nerve stimulation
  - Progressive weight bearing
  - Tactile desensitization
  - Massage
  - Contrast baths
  - Home exercise program
- Ultimately patient and guardian dictate course of treatment

**What the Research says**
- There is evidence that somatic and sympathetic blocks may be helpful
- However not all respond to nerve blocks
- Significant relapse rate and an incomplete cure rate for CRPS
- Familial clusters associated
- Migraine headaches are associated with CRPS
- Most children (70%) required adjuvant medications
- Progressive physical disability as individual avoids painful movements
- Correlated with Depression

**Where do we go next?**
- More research is needed in all areas of CRPS to:
  - Improve diagnostic criteria in order to treat patient immediately.
  - To better control CRPS through medication (including analgesics)
  - To control CRPS through physical therapy.
  - To create treatment protocols (such as one below) to increase likelihood of successful treatment quickly and conservatively.

**Conclusion**
- While there is no concise medical agreement whether PT versus analgesic therapy is best for treatment of CRPS, Physical Therapy is recognized as a cornerstone of treatment for pediatric CRPS.
- The most critical component of a good prognosis is early diagnosis and treatment.
- Our question was not answered during our review of the available literature.

**Research limitations**
- Low levels of evidence
- Often not immediately diagnosed leading to difficult experimental processes
- Difference from adults makes it more demanding on both patient and researcher
- Strenuous on patient to carry out randomized trials due to painful nature of disease

**Resources**