Pediatric Pain: an evolving understanding of preventable harm

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Disclosure

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Objectives

- Describe the epidemiology of chronic pain in pediatric population.
- Discuss the importance of treating chronic pain in pediatric population.
- Discuss the multimodal treatment modalities for pain.
Definition

• “Pain is an unpleasant sensory and emotional experience, associated with actual or potential tissue damage, or described in terms of such damage” (International Association for the Study of Pain)

• “Chronic pain in children is the result of a dynamic integration of biological processes, psychological factors, and sociocultural context, considered within a developmental trajectory” (American Pain Society, 2001)

History

An Evolution of Understanding

• Undertreatment of pain in children.
  ➢ Limited clinical information
  ➢ Persistence of misinformation
  ➢ Attitudes about pain in children
• Pre 1970s—Pediatric pain literature almost non-existent
• 1980s—Pain management in the newborn
• 1990s—Guideline development with multidisciplinary teams
• 2001—JCAHO standards and ‘fifth vital sign’ APS and AAP Policy statement
The Purpose of Pain

Pain is a warning signal that something is wrong.

That’s a good thing!

So why would that be a problem?

| Pain... So what? |
|------------------|------------------|
| System Consequences of untreated Pain |
| Pulmonary | Decreased flow & Decreased volume, retained secretions & atelectasis |
| Cardiovascular | Increased HR, increased CO, increased SVR, increased myocardial O2 consumption |
| Renal | Increased diuresis, increased metabolic rate, increased HR, increased water retention |
| Immune | Depression of immune functions |
| Coagulation | Platelet adhesions, fibrinolysis, activation of coagulation cascade |
| Gastrointestinal | Delayed return of gastric and bowel function |
| Musculoskeletal | Decreased muscle function, fatigue & immobility |

Why treat pain in Children?

• There is mounting data to show that untreated or poorly treated pain in children has lasting negative effects

<table>
<thead>
<tr>
<th>Identification</th>
<th>Changes in pain processing, especially during critical periods of development</th>
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<tbody>
<tr>
<td>Distress</td>
<td>Memories for pain amount of distress experienced in early life shapes response in future events</td>
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<tr>
<td>Avoidance</td>
<td>Specific or generalized (e.g., needles, white coats) higher risk for morbidity and mortality with avoidance of preventative or maintenance care</td>
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<tr>
<td>Analgesic use</td>
<td>Increased analgesic and anxiolytic requirements in future procedures</td>
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Distress

Children with negative pain memories:
• Higher levels of anxiety
• Expected to experience more pain in future
• Experienced greater increase in pain reporting over time

Epidemiology

• Chronic pain is conservatively estimated to affect 20% to 35% of children and adolescents around the world (King et al., 2013; Stanford, Chambers, Bresnan, & Chen, 2008).

• Research on the neurobiology of pain shows that children of all ages, have the capacity to perceive pain (Fitzgerald 2005).

• Untreated chronic pediatric pain is personally, socially & financially burdensome for individuals, families and societies.
Psychological Correlates: What the Studies Show

- Chronic pain - high levels of disability, anxiety, school absence, and health care utilization.
- Chronic pain patients have:
  - greater levels of stress, anxiety, depression, and somatic symptoms, than well children.
  - More functional impairment and school absences compared to children with organic disorders.

Common Pediatric Pain conditions

- Low back pain
- Headaches
- Abdominal pain
- Musculoskeletal pain
- Neuropathic pain
- CRPS
- EDS/Benign joint Hypermobility
- Pain with JIA
- Chest pain
- Pain secondary to general medical condition
- Cancer pain
- Sickle cell d/o
- Somatic symptoms d/o, Functional Pain

What leads to Chronic Pain?

- Surgeries
- Trauma/injuries
- Congenital conditions
- Obesity
- Medical illness
- Mental Health problems
- Unknown
Bio-Psycho-Social Model & The Role of Interdisciplinary Team

- Common behavioral and clinical features.
- The attempt to dichotomize the presentation as either biological or psychological is an oversimplification.

Biopsychosocial Model

- Biological: Genes, Sex, Physical health, Disease
- Psychological: Stress, Anxiety, Depression, Individual Beliefs, Coping
- Social: Family, Peers, School, Cultural/SES
Shared Biological & clinical features

• Shared biological mechanism

• Shared clinical features
  – Female preponderance
  – Family hx
  – Psychosocial trauma
  – Certain Personality types and Mental health d/o
  – Autonomic dysregulation - POTS
  – Hypermobility
  – Sleep disturbance
  – Impact on school & family life

Interdisciplinary Pain Medicine

Comprehensive pain treatment programs involving interdisciplinary, multimodal treatment approaches are often required in treating complex & disabling pain conditions.

Interdisciplinary Treatment Goals

• Maximizing pain reduction
• Improving health related quality of life
• Independence & mobility
• Enhancing psychological well being
• Preventing secondary dysfunction
Who is on the Interdisciplinary Team?

- Physician - Anesthesiologist, Psychiatrist, Neurologist, Physiatrist, PCP.
- Psychologist
- Physical Therapist/ Occupational therapist
- Alternative medicine specialist
- ARNP
- Social Worker
- Nurses/MA's
- Pharmacist

A Functional Approach to Pain

- The focus of chronic pain management is to improve function— function improves before pain.
  - Lynch-Jordan et al 2014
  - Physical activity and sensory input normalize pain signals
- This is counterintuitive because typically pain makes us rest— so this approach requires a lot of support from an interdisciplinary team
  - Medical: Medication, reassurance for function
  - Physical: Build strength & endurance, restore independence of ADLs, address fear of pain through exposure
  - Psychological: Cognitive behavioral pain coping skills

Initial evaluation

- Initial evaluation – 3 hours
- Involves the patient seeing:
  - MD
  - Physical therapist
  - Psychologist
  - ARNP
  - Social worker
Treatment approach

Detailed evaluation to devise a multimodal treatment plan
- Education, lifestyle modifications
- Physical therapy/Occupational therapy
- Psychological therapies
- Pharmacotherapy
- Integrative medicine
- Procedural interventions
- School re-integration
- Addressing Sleep
- Addressing other symptoms (dizziness, nausea, fatigue)

Pharmacotherapy

- Less is more
- Always in context with multidisciplinary therapies
- Limitations
  - Lack of pediatric studies
  - Lack of FDA approval
  - Extrapolation from adult literature
  - Best judgment, expert consensus

Pharmacotherapy

- Analgesics
  - Tylenol, NSAIDs, Aspirin, Cox 2 inhibitors
  - Opioids

- Adjuncts:
  - Antidepressants: TCA, SNRIs, SSRI
  - Anticonvulsants: gabapentin, Pregabalin, Carbamazepine, Oxcarbazepine, Topiramate, Lamotrigine, Divalproex sodium, Zonisamide
  - Clonidine
  - NMDA antagonists
  - Other psychoactives: Neuroleptics, stimulants

- Muscle Relaxants: Methocarbamol, Tizanidine, Cyclobenzaprine, Baclofen
- Topical Preparations: Lidocaine, Steroid, Diclofenac, DMSO, Capsaicin, Compounded mixtures
Interventions

• Purpose
  ➢ Diagnostic
  ➢ Therapeutic
  ➢ Adjunctive

Interventions

• Trigger point injection
• Epidural steroid injection
• Facet/MMB/pars
• Peripheral nerve block
• Sympathetic ganglion block
• SI joint injection
• Large joint/Bursa injection
• Intercostal block
• Occipital nerve block
• Botox

Integrative Medicine

• Aromatherapy (use of essential oils topically or inhalation)
• Acupressure
  ➢ Sea-Bands (for nausea)
  ➢ Acupressure mat/neck pillow (myofascial pain, headaches)
• Manual Therapies
  ➢ E-Stim (offered by PT)
  ➢ Yoga Therapy/Balls (offered by PT)
  ➢ Heat, Ice
• Vitamins, Herbals, and Supplements
  ➢ Ginger, Peppermint
  ➢ Various different vitamins, herbals, and supplements
• Future hope is to add auriculotherapy (ear acupuncture or ear acupuncture) to our offered services
Pain education

- Predicts patients responsiveness to intervention and reduction in pain score
- Repeated and overlapping education on pain
  - PT, MD, Psych, NP, Social Work
- Outreach to schools and other providers

Physical Therapy

- Evaluation
- Provide education on returning to exercise
  - “The nervous system needs space & blood flow”
  - “Sore but safe”
  - Graded return to exercise is the key
- Motivational interviewing to assist with empowerment
- Assisting with goal setting

Social Worker

Assesses for barriers that may prevent families from successfully implementing recommendations from the team or other concrete needs.

- Collaboration between internal and external providers
- Accommodations and planning for success at school
- Healthy lifestyle routines development
- Parenting strategies
- Goal setting and motivation
- Local resource finding
- Concretes needs: transportation, insurance, financial
Psychotherapy

• Flight or Fright Response to Threat - Involvement of the Sympathetic Nervous System
• Therapeutic modalities: CBT, ACT, Building coping skills, Relaxation strategies, Mindfulness Meditation
• Skills Training for Parents

Golden Rules of Chronic Pain

Lonnie Zeltzer, MD

• All pain is real
• Improvement is first measured by increased functioning
• Don't ask your child if she is in pain
• Exercise is good for sleep and chronic pain
• Sleep is important
• Reduce anxiety
• A long term problem requires a long term solution

Questions