Comorbidities of Depression, Anxiety and Chronic Pain in Children & Adolescents

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Objectives

• Identify chronic pain conditions in children and adolescents.
• Review prevalence of depression and anxiety in children and adolescents. Discuss the relationship of chronic pain and co-morbidity of anxiety and/or depression in children and adolescents with chronic pain.
• Review treatment options for chronic pain and anxiety and/or depression in children and adolescents.
• Present case studies of children and adolescents with chronic pain and comorbid anxiety and/or depression.

Nothing to disclose

“Chronic and recurrent pain not associated with a disease is very common in childhood and adolescence”

Chronic pain is more common in girls and commonly increases with age.

Studies suggest prevalence of chronic pain in children is from 23% to 51%.

King, S., et al. (2011)
Chronic pain in Children and Adolescents

Table 2. Summary of prevalence rates by pain type.

<table>
<thead>
<tr>
<th>Pain type</th>
<th>Prevalence range</th>
<th>Median</th>
<th>Quality criteria met</th>
<th>Sex differences</th>
<th>Psychosocial/demographic factors associated with increased prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>8-82.9%</td>
<td>9</td>
<td>Older &gt; younger</td>
<td>Girls &gt; boys</td>
<td>Presence of anxiety and depression; low self-esteem (girls only); positive family history of headache; low SES (conflicting findings)</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>3.8-53.4%</td>
<td>8</td>
<td>Older &gt; younger</td>
<td>Girls &gt; boys</td>
<td>Presence of anxiety symptoms; school stress; emotional symptoms; low self-esteem (conflicting findings); emotional symptoms (conflicting findings); family history of abdominal pain; low SES; conflicting findings; low SES (conflicting findings)</td>
</tr>
<tr>
<td>Back pain</td>
<td>13.5-24%</td>
<td>7</td>
<td>Older &gt; younger</td>
<td>Girls &gt; boys</td>
<td>Presence of anxiety symptoms; school stress; emotional symptoms; low self-esteem (conflicting findings); emotional symptoms; low self-esteem (conflicting findings); family history of back pain; low SES; conflicting findings</td>
</tr>
<tr>
<td>Musculoskeletal/limb pain</td>
<td>5.9-40%</td>
<td>7</td>
<td>Older &gt; younger</td>
<td>Girls &gt; boys</td>
<td>Presence of anxiety symptoms; school stress; emotional symptoms; low self-esteem (conflicting findings); emotional symptoms; low self-esteem (conflicting findings); family history of back pain; low SES; conflicting findings</td>
</tr>
<tr>
<td>Multiple pains</td>
<td>3.6-44.8%</td>
<td>8</td>
<td>Unclear</td>
<td>Girls &gt; boys</td>
<td>Presence of anxiety symptoms; school stress; emotional symptoms; low self-esteem (conflicting findings); emotional symptoms; low self-esteem (conflicting findings); family history of back pain; low SES; conflicting findings</td>
</tr>
<tr>
<td>Other/general pain</td>
<td>5-88%</td>
<td>8</td>
<td>Possible age interaction</td>
<td>Girls &gt; boys</td>
<td>Poor self-rated health; feeling low or irritable; feeling nervous; bad temper; feeling nervous; low self-esteem; family history of pain; low SES; conflicting findings</td>
</tr>
</tbody>
</table>

Factors which increases prevalence in children and adolesices with abdominal pain include:

- Anxiety in children and their mothers
- Anxiety and depression in children
- Feelings of sadness in younger girls
- School stress

Treatment of Chronic Pain in Children and Adolescents

- Mind-based approaches can be helpful non-invasive treatment options for chronic pain
  - Hypnosis
  - Biofeedback
  - Art therapy

Tsao, J., et al., 2006
Anxiety in Children & Adolescents

- One of the most prevalent MH disorders in children
- Females are more likely to have diagnosis
- Common onset of anxiety occurs around age 14
- Neuroimaging studies have shown that youth with anxiety have a hyperactivated amygdala and their ventrolateral prefrontal region does not modulate anxiety as quickly as seen in non-anxious youths

(American Psychiatric Association, 2000)

Anxiety in Children & Adolescents

- Symptom manifestation may be more somatic including fatigue, muscle tension, insomnia, malaise, dry mouth, syncope, SOB, diarrhea, nausea, and abdominal pain

(Rockhill, Kodish, DiBattisto, Macias, Varley, & Ryan, 2010)

Anxiety Symptoms in Children

(Rockhill, Kodish, DiBattisto, Macias, Varley, & Ryan, 2010)
Statistics of Anxiety Disorders Among Children

Average Onset of Age 11 years old

Generalized Anxiety Disorder Among Children

GAD: Considerations for Pediatrics

- Most frequently treated psychiatric d/o
- Quality of performance or competence
- Overly conforming, perfectionist, and unsure of themselves
- Seeking approval and reassurance
- May have less physical symptoms than adults
- Diagnostic Criteria C: ONLY ONE ITEM IS REQUIRED FOR CHILDREN.
- May be over diagnosed
- Higher rates of suicidal behavior, early parenthood, drug & alcohol dependence, and education underachievement. (Boyd, 2008)
PTSD Among Children

http://www.nimh.nih.gov/statistics/1AD_PTSD_CHILD.shtml

• Rejection of closeness
• Child’s sense of a loss of the vigor and magic of youth
• Cognitive impairment or forgetfulness
• Sleep disturbances that persist more than several days
• Dependency behaviors such as clinging, separation anxiety, and reluctance to attend school
• Extreme fear of distress associated with events that remind the child of the trauma
• Behavioral or emotional changes
• Dissociations
• Intrusive reexperiencing of the event
• Persistent avoidance of related stimuli
• Regression to previous development stage
• Questions about self-worth and expression of need for solitude


PTSD: Considerations for Pediatrics

Social Phobia Among Children

http://www.nimh.nih.gov/statistics/1SOC_CHILD.shtml
Social Phobia: Considerations for Pediatrics

- There must be evidence of the capacity for age-appropriate social relationships with familiar people and the anxiety must occur in peer settings, not just in interaction with adults.
- The anxiety may be expressed by crying, tantrums, freezing, or shrinking from social situations with unfamiliar people.
- The child may not recognize the fear is excessive or unreasonable.

Depression in Children & Adolescents

- Estimated that 20% of adolescents have depressive episode by adulthood
- 50% adolescents that show symptoms of depression will have symptoms as an adult
- Estimated that 20% youths showing signs of depression will develop BPAD

Symptoms may be different than seen in adult patients such as anger, irritability, and anxiety (Bolfek et al., 2006)
- Young children may show symptoms of school phobia and excessive clinginess to parents (Sadock & Sadock, 2003)
- Other symptoms include poor academic functioning, substance abuse, antisocial behavior, truancy, promiscuity, and running away from home (Sadock & Sadock, 2003)
- May be helpful to use specific rating scales for children such as:
  - Child Depression Rating Scale
  - Children’s Depression Inventory
  - Beck Depression Inventory (Bolfek et al, 2006)
Comorbidity of Depression and/or Anxiety in chronic pain

- Miller and Cano (2009)
  - Research looking at prevalence of risk factors of chronic pain and presence of depression in adults.
  - 35% of participants with chronic pain had depression

  - Anxiety, depression and low self-esteem impact pain prevalence in children and adolescents.

Chronic Abdominal Pain and Depressive Symptoms: Analysis of the National Longitudinal Study of Adolescent Health

<table>
<thead>
<tr>
<th>Depressive Symptoms</th>
<th>Rare pain</th>
<th>Daily pain</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feel sad 5.3%</td>
<td>25.3%</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Feel like crying 1.0%</td>
<td>12.1%</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Feel lonely 6.4%</td>
<td>25.2%</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Feel low energy 4.8%</td>
<td>19.1%</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Feel life is a failure 3.3%</td>
<td>10.7%</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>

Children with daily pain were more likely to have changed their primary residence in the prior 5 years (P < .05). Frequency of abdominal pain or risk of depression was not related to family socioeconomic status.


Table 2: Prevalence of clinically relevant psychiatric disorder: parental interview (DISC-P) by pain location, n (%)

<table>
<thead>
<tr>
<th>DISC-P</th>
<th>Total (n = 134)</th>
<th>MP (n = 60)</th>
<th>AP (n = 43)</th>
<th>HA (n = 31)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychiatric disorder</td>
<td>28 (20.9)</td>
<td>8 (13.3)</td>
<td>10 (23.3)</td>
<td>10 (32.3)</td>
<td>0.098</td>
</tr>
<tr>
<td>PD no impairment*</td>
<td>53 (39.6)</td>
<td>21 (35.0)</td>
<td>18 (41.9)</td>
<td>14 (45.2)</td>
<td>0.590</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>24 (17.9)</td>
<td>7 (11.7)</td>
<td>8 (18.6)</td>
<td>9 (29.0)</td>
<td>0.122</td>
</tr>
<tr>
<td>Affective disorder</td>
<td>7 (5.2)</td>
<td>2 (3.3)</td>
<td>3 (7.0)</td>
<td>2 (6.5)</td>
<td>*</td>
</tr>
<tr>
<td>Disruptive disorder*</td>
<td>7 (5.2)</td>
<td>3 (5.0)</td>
<td>2 (4.7)</td>
<td>2 (6.5)</td>
<td>*</td>
</tr>
</tbody>
</table>

* Table 2 Prevalence of clinically relevant psychiatric disorder: parental interview (DISC-P) by pain location, n (%)

** PD = pain duration; PD no impairment = pain duration with no impairment; MP = musculoskeletal pain; AP = abdominal pain; HA = headache
** DISC-P = Diagnostic Interview Schedule for Children-Parent Report

** ADHD = Attention Deficit Hyperactivity Disorder
** ODD = Oppositional Defiant Disorder
** Conduct Disorder = Conduct Disorder
** CGAS = Children's Global Assessment Scale

Table 3 Prevalence of clinically relevant psychiatric disorder: child psychiatric assessment (SCICA) by pain location, n (%)

<table>
<thead>
<tr>
<th>SCICA</th>
<th>Total (n = 331)</th>
<th>MP (n = 58)</th>
<th>AP (n = 63)</th>
<th>HA (n = 30)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychiatric disorder</td>
<td>38 (29.0)</td>
<td>11 (19.0)</td>
<td>15 (24.6)</td>
<td>12 (40.0)</td>
<td>0.07</td>
</tr>
<tr>
<td>PD no impairment*</td>
<td>69 (52.6)</td>
<td>22 (32.8)</td>
<td>26 (41.6)</td>
<td>21 (70.0)</td>
<td>*</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>16 (12.2)</td>
<td>4 (6.9)</td>
<td>6 (14.0)</td>
<td>6 (20.0)</td>
<td>*</td>
</tr>
<tr>
<td>Affective disorder</td>
<td>25 (19.1)</td>
<td>7 (12.1)</td>
<td>11 (25.6)</td>
<td>7 (23.1)</td>
<td>0.185</td>
</tr>
<tr>
<td>Disruptive disorder</td>
<td>12 (9.2)</td>
<td>4 (6.9)</td>
<td>3 (7.0)</td>
<td>5 (16.7)</td>
<td>*</td>
</tr>
</tbody>
</table>

One or more psychiatric disorder per patient and CGAS < 61
MP Musculoskeletal pain, AP abdominal pain, HA headache
* Conditions for chi-quadrate analysis not met
* Confidence for chi-quadrate analysis not met
ADHD, ODD, Conduct Disorder

Chronic Pain in Adolescents is Associated with Suicidal Thoughts and Behaviors (van Tillburg, et. al. 2011)

- Analyzed data from the National Longitudinal Study of Adolescent Health, a longitudinal study of a nationally representative sample of adolescents in the United States (N = 9,970)
- Most chronic pain was related to suicide ideation/attempt both in the last year (odds ratio [OR] 1.3-2.1) and during the subsequent year (OR 1.2-1.8)
- After controlling for depressive symptoms
  - Headaches (OR = 1.3 last year, OR = 1.2 subsequent year)
  - Muscle aches (OR = 1.3 last year) remained associated with suicide ideation but not suicide attempt
- Findings show that chronic pain in adolescence is a risk factor for suicide ideation; this effect is partly but not fully explained by depression

Multiple somatic symptoms linked to positive screen for depression in pediatric patients with chronic abdominal pain. (Little, Et. Al. 2007)

FIG. 1. Percent of patients reporting nongastrointestinal symptom presence in the previous 2 weeks by positive vs negative depression screening group.

FIG. 2. ROC curve for sensitivity and specificity of prediction of positive depression screening based on number of nongastrointestinal symptoms endorsed.
Citalopram treatment of pediatric recurrent abdominal pain and comorbid internalizing disorders: an exploratory study

- Twenty-five clinically referred children and adolescents with recurrent abdominal pain aged 7 to 18 years.
- 12-week, flexible-dose, open-label trial of citalopram.
- Outcome measure was the Clinical Global Impression Scale-Improvement, with responders defined by ratings of 1 (very much improved) or 2 (much improved). Secondary measures included self- and parent reports of abdominal pain, anxiety, depression, other somatic symptoms, and functional impairment.
- Side effects were assessed using a standardized checklist.
- Twenty-one subjects (84%) were classified as responders (Clinical Global Impression Scale-Improvement scores ≤ 2).
- Citalopram was generally well tolerated.
- Ratings of abdominal pain, anxiety, depression, other somatic symptoms, and functional impairment all improved significantly over the course of the study compared with baseline.
- This study suggested that Citalopram is a promising treatment for functional pediatric recurrent abdominal pain.
- Studies currently in process


Treatment Options

Antidepressants – Treatment for Anxiety & Depression

- **Tricyclics**
  - Includes Nortriptyline, Clomipramine, Imipramine
  - Effective for treatment of depression, OCD, separation anxiety, & ADHD
  - MOA: Blocks reuptake of norepinephrine and serotonin
  - Side effects: fatigue, dizziness, dry mouth, sweating, weight gain, urinary retention, tremor, and agitation
  - Can prolong QT interval and increase risk for fatal ventricular tachycardia
  - Narrow therapeutic index

- **SSRIs**
  - Fluoxetine, Sertraline, Paroxetine, Fluvoxamine, Citalopram, Escitalopram
  - Effective for treatment of depression, OCD
  - MOA: Block reuptake of Serotonin into presynaptic cleft
  - Long half life
  - Dosed one time daily
  - Side effects: activation, insomnia, diarrhea,
  - Can induce mania in children

Many drugs not studied in children
Antidepressants Continued…

• Bupropion
  – One study showed efficacy in treatment ADHD in adolescents

• Venlafaxine
  – Only one study done with children showed not more effective than placebo in treatment of depression
  – Acts by inhibiting reuptake of both Norepinephrine and Serotonin

CAM with Children and Adolescents

The National Institute of Health (http://ncbi.nlm.nih.gov) identifies many different CAMs:

- Meditation, yoga, Acupuncture, deep breathing, progressive relaxation, guided imagery, hypnotherapy, qi gong and Tai Chi.
- Spinal manipulation and massage therapy as well as the movement therapies of Feldenkrais, Alexander technique, pilates and rolling
- Whole body techniques such as Ayurvedic and traditional Chinese medicine
- Equine Assisted therapy is available for therapeutic horseback riding
- Biofeedback
- Omega 3 Fatty Acid

Caution:
- Select the CAM practitioner with care
- Share the information about the use of any CAMS to any other of your providers.

Herbs used for Psychotropic Effect

• St John’s Wort – for mild to moderate depression
• Valerian – sedative and anxiolytic activity
• Kava – “tranquilizer”, sedative, may be helpful for generalized anxiety disorder
• Lemon Balm – anxiolytic
• Black Cohosh – used for anxiety
• German Chamomile - used for GI spasms, sedative, hypnotic, anxiety

Keltner, N & Folks, D (2005)
Herbs used for Psychotropic Effect

- Evening Primrose – treatment of schizophrenia, childhood hyperactivity, and dementia
- Hops – mild sedative
- Passion Flower – sedative hypnotic for adjustment disorder with anxious mood
- Scullcap – sedative and anticonvulsant
- Ginkgo – treat memory and cognitive impairments with dementia
- Ginseng – treat stress and fatigue
- Melatonin – treat sleep
- Caution - Remember that some supplements may interact with other supplements and herbals.

Core Components CBT Model for Anxiety with Youth

- Parent Interventions
  - Provides parents education regarding the risks of continued avoidance and guidance in managing anxiety
  - Basic parenting strategies
    - Positive/negative reinforcement
    - Planned ignoring
    - Modeling
    - Reward planning

Biofeedback

- Real-time feedback through various physiological responses
  - Helps the individual with developing awareness of the changes in the body and to learn individualized ways of voluntarily controlling the bodies responses
Biofeedback for Pain Management

- Targets factors that are related to pain responses on the body
  - Related to pain exacerbations
  - Related to emotional responses to the pain
  - Helps identifying strategies that are ineffective and effective for reducing pain responses on the body

Kerns, R., Sellinger, J., & Goodin, B. (2011)

Evidence of Biofeedback in Children and Adolescents with Chronic Pain

- Banez, G (2008) Study 64 children and adolescents with recurrent abdominal pain
  - Randomly assigned 4 groups for biofeedback
    - Results revealed all groups showed improvements with self reported pain

- Palamaro, T., et al. (2010)
  - CBT, Biofeedback and relaxation clinically significant for reducing pain in children with headaches, abdominal pain and fibromyalgia p<0.0001

Case Review
Take Home Points

• Chronic and recurrent pain occurs in 23-51% of children and adolescents.
• Factors such as anxiety and depression can contribute to chronic pain.
• Mind-based approaches are helpful for both chronic pain and mood disorders in children and adolescents.
• Multimodal analgesia is important for children and adolescents with chronic pain.
• Studies suggest that children and adolescents with chronic pain and depression may be at risk for suicide.

References


References


http://www.clinic.ch.hk. What is Complementary and alternative medicine?
References