Chronic Pelvic Pain in Adolescents
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Dr. Burgis has no relevant financial relationships to disclose.

Pelvic Pain in Adolescents
Many Causes
• Primary or Secondary
• Cyclic or non-Cyclic
• Acute or Chronic

Approach to the adolescent with dysmenorrhea, endometriosis, interstitial cystitis, müllerian anomalies, GI, myofascial pain
Pelvic Pain in Adolescents

• Often precise pathology not established
• Neurologic
• Gynecologic
• Urologic
• Gastrointestinal
• Musculoskeletal

Udoji and Ness, Painmanage(2013)3(5)387-394

Pelvic Pain in Adolescents

Current management includes
• Surgical
• Medication
• Physical Therapy
• Interventional procedures
• Complementary and alternative medicine

Learning Objectives

• Perform an appropriate history and evaluation of an adolescent with pelvic pain
• State the gynecologic causes of non acute pelvic pain
• Understand the guidelines for long term management of these patients
History

- Confidentiality
  - History of Present Illness
  - Past medical / surgical
  - Menstrual history
  - Family History
  - Psychosocial history
    - HEADSS

Physical Examination

- Taylor to age and maturity
- Reassure the patient
- Exam components
  - abdominal exam
  - musculoskeletal exam
  - Tanner stage
  - external genitalia
  - internal genitalia

Lab tests and Imaging Studies

- UPT, GCC, UA C&S to start
- Pelvic ultrasound especially if patient is unable/unwilling to have pelvic exam
- MRI
Ultrasound

- Can define uterine and vaginal abnormalities
- Can delineate a pelvic mass
- Will not detect adhesions, endometriosis

Symptom tracking

- Useful tool for teens to track periods and symptoms
- Example: http://youngwomenshealth.org/PDFs/yearly_period_tracker.pdf

Differential diagnosis for GYN Pain

**Cyclic**
- Dysmenorrhea
- Endometriosis
- Leiomyoma
- Obstructive anomalies
- Ovarian cyst/mass
- Fallopian tube

**Non Cyclic**
- Endometriosis/adenomyosis
- Pelvic adhesions
- Chronic infection
- Obstructive anomalies
- PMS
- Fallopian tube/ovary
- Interstitial cystitis
- Vaginitis/vulvitis
Primary Dysmenorrhea

- Pain with menses
- Very common up to 90%
- 1-3 years after menarche
- Starts 1-4 hours prior to menses
- Lasts 1-2 days
- Nausea, vomiting, fatigue

Primary Dysmenorrhea

- Reported in 40% to 90%
- No identifiable cause
- Most common cause of missed school days
- Mediated by prostaglandins

Primary Dysmenorrhea

- **Uterus**: phospholipids converted to arachidonic acid
- Metabolized by lipoxygenase and cyclooxygenase
- Leads to cyclic endoperoxides
- Endoperoxides are converted to prostacyclin, thromboxanes, and prostaglandins
- Mediators of pain, smooth muscle contraction, platelet disaggregation, and vasodilation
Primary Dysmenorrhea Treatment

- Non Steroidal anti-inflammatory drugs (NSAID)
- Analgesic and anti-inflammatory properties
- Inhibit cyclooxygenase
- Ultimately decreases prostaglandins
- Relieves dysmenorrhea and associated symptoms
- NSAIDs come in different classes

Primary Dysmenorrhea Treatment

- Ibuprofen and naproxen most widely studied
- Give pain relief in 67% to 86% of patients
- Fenomates inhibit prostaglandin formation and may antagonize that already formed
- May be useful when less expensive NSAIDs have not worked well
**Primary Dysmenorrhea**

**Treatment**

- Combination hormonal therapy (CHT)
  - Pills, rings, patch
  - Lessen dysmenorrhea
  - Prevent ovulation
  - Induce endometrial hypoplasia
  - Fewer prostaglandins

**Primary Dysmenorrhea**

- Dong quai, fish oil, vitamin E, vitamin B6
- Sometimes used little evidence
- Acupuncture, yoga
  - Some utility ........
  - Limited evidence to help

**Heat Patch and Dysmenorrhea**

- *Turkish College students*
- Compared 3 groups
- Placebo, NSAID, and heat patch
- Found heat patch work synergistically with NSAID to relieve pain
- 4 times more effective

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D.C. Potur, N. MinicKantu / Pediatr Adolesc Gynecol xxx (2013) 346
Association of Vitamin D Status and Severity of Menstrual Pain

- Study of Middle Eastern College aged women showed no association between Vitamin D status and dysmenorrhea
- Found high prevalence of Vitamin D insufficiency and deficiency (25% and 16%)
- Implications for bone health


Effect of Acupuncture on Primary Dysmenorrhea

- 30 College Students
- SP6 accupoint
- Relieved dysmenorrhea
- Effect lasted 3 hours post treatment

N. Mirbagher-Ajorpaz 34 et al. / Complementary Therapies in Clinical Practice 17 (2011) 33e36

Primary Dysmenorrhea Treatment

- Patients need follow up in 2 to 3 months
- If symptoms fail to resolve Laparoscopy is indicated
- Consider endometriosis, other organic causes
Secondary Dysmenorrhea

- Painful menses attributed to *pelvic pathology*
- 10% adolescent dysmenorrhea
- Prevalence in adolescents unknown
- 70% of adolescents undergoing laparoscopy for refractory dysmenorrhea

Chronic Pain – persistent dysmenorrhea

*For teens*

- Missed school days
- Loss of social interaction
- Diagnosis is important as teens and parents may have concern about the diagnosis
- Evaluate unresponsive pain after 2 to 3 months
- Laparoscopy is invaluable
Laparoscopic findings in Adolescents with Chronic Pelvic Pain

<table>
<thead>
<tr>
<th>FINDING</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal pelvis</td>
<td>25–40%</td>
</tr>
<tr>
<td><strong>Endometriosis</strong></td>
<td><strong>38–45%</strong></td>
</tr>
<tr>
<td>Ovarian cyst</td>
<td>2–5%</td>
</tr>
<tr>
<td>Uterine malformations</td>
<td>5–8%</td>
</tr>
<tr>
<td>Postoperative adhesions</td>
<td>4–13%</td>
</tr>
<tr>
<td>Pelvic inflammation</td>
<td>5–15%</td>
</tr>
<tr>
<td>Others</td>
<td>2%</td>
</tr>
</tbody>
</table>


Chronic Pain – persistent dysmenorrhea

- **Endometriosis**: histopathological evidence of endometrial glands outside the endometrial cavity
- Present in 4% to 17% of postmenarchal teens
- 70% of adolescent girls undergoing laparoscopic evaluation of refractory dysmenorrhea
- Classic presentation less common in teens

Presenting Symptoms of Endometriosis in Adolescents

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclic and acyclic pain</td>
<td>62–95%</td>
</tr>
<tr>
<td>Acyclic pain</td>
<td>28%</td>
</tr>
<tr>
<td>Cyclic pain</td>
<td>9.4%</td>
</tr>
<tr>
<td>Dysmenorrhea</td>
<td>95%</td>
</tr>
<tr>
<td>Deep dyspareunia</td>
<td>29%</td>
</tr>
<tr>
<td>Irregular menses</td>
<td>9–25%</td>
</tr>
<tr>
<td>Gastrointestinal pain/nausea</td>
<td>34–43%</td>
</tr>
<tr>
<td>Urinary symptoms</td>
<td>12.5%</td>
</tr>
<tr>
<td>Vaginal discharge</td>
<td>6%</td>
</tr>
</tbody>
</table>

Etiology of Endometriosis

- Sampson’s – retrograde menstruation
- Meyer’s – embryologically totipotent cells that undergo metaplasia
- Halban’s – spread through vascular of lymph
- Deficient cell mediated immunity
- Environmental exposures
- Genetic predisposition – 6.9% rate in first degree relatives

Endometriosis

- Initial treatment – oral contraceptives and NSAIDs
- Laparoscopy if first line fails
- Medical therapy necessary following surgery
Endometriosis – Surgical Therapy

• Diagnosis
• Destruction
• Excision
• Goal is to remove/destroy all visible lesions

Endometriosis – Medical Therapy

• Medical management can achieve 2 goals
  • Pain control and disease progression
  • Combination hormonal therapy, used continuously (pills, patch, ring)
  • Progestin - norethindrone, MPA, DPMA, progesterone IUD
  • Gonadotropin – Releasing Hormone agonists (with add back therapy)

Endometriosis – Medical Therapy

• Add back therapy, goal to relieve side effects without stimulating endometriosis growth
• Norethindrone acetate 5 mg a day
• After 9 months bone density test
• If normal bone density, may continue GnRH-a or switch to CHT or progestin
• Duration of therapy - unknown
Progression of Endometriosis in Non-medically Managed Adolescents

*Case series of teens*
- Each diagnosed with Stage I endometriosis
- Each non-compliant with medical follow-up therapy
- Each returned to the operating room
- Disease progression in each

Unger CA and Laufer; BMJ JGG 2(2011)21-23

Ovarian cysts

- Variation of a normal physiologic process
- Most simple cysts result from failed ovulation and involution
- Range of symptoms!!
- Most are “functional”
- “Ovaries make cysts for a living”

Functional Ovarian Cysts
Diagnostic Tips

- Best technique to evaluate is ULTRASOUND

- <3 cm considered physiologic
- < 6 cm -- asymptomatic and fluid filled may be observed
- Oral contraceptives do not “shrink”
- Surgical management – Ovarian cystectomy

Adolescent Adnexal Masses

- Eskander reviewed adolescent adnexal masses from 2003-2009
- Average age 11.9 years
- 190 surgical procedures
- Reviewed to evaluate operating surgical specialty and management differences

Eskander,RN et al. JPAG 24(2011)282-285

Adolescent Adnexal Masses

- 91% benign
- 8.9% malignant
- Ovarian preservation about 50%
- Combination of gynecologist and pediatric surgery provided optimum management

Eskander,RN et al. JPAG 24(2011)282-285
• Corpus luteum --- Imaging may vary
• Persistent bleeding or rupture may require surgical intervention
• Ovarian conservation preferred --- if bleeding can be managed by fulguration

Ovarian Torsion
• **Right** more common than left
• Beaunoyer et al followed 76 children with torsion
• 51.2% had ovarian abnormalities:
  – Simple cyst
  – Cystadenoma
  – Hydrosalpinx
  – No malignancy

Ovarian Torsion
• Ovarian torsion may occur with a cyst of any size, **R > L**
• Onset – acute, +/- fever, leukocytosis
• Torsed ovary **always** enlarged
• Ultrasound with doppler may aid in diagnosis
• Torsion of one adnexa increases the risk of torsion of the other adnexa
• Contemporary management - detorsion
Müllerian Anomalies

- Responsible for pelvic pain
- Many types, some obstructing
- \textit{Suspect} obstructing anomaly in girls with primary amenorrhea and cyclic pain
- Mayer Rokitansy Küster Hauser (MRHK) – uterine remnants present, removal recommended

Müllerian Anomalies

- Great resource:
  - Center for Young Women’s Health
  - www.youngwomenshealth.org
Müllerian Anomalies

- MRI Best imaging modality
- 20% may have endometriosis
- Severe dysmenorrhea and pelvic pain
- Pain may be cyclic or acyclic
Pelvic Inflammatory Disease (PID)

- Adolescents at increased risk
  - physiology
  - behavior

Reported rates of chlamydia and gonorrhea rates highest in females aged 15-19

- Sequelae include: infertility, ectopic pregnancy, chronic pelvic pain

Pelvic Inflammatory Disease (PID)

- CDC STD Treatment Guideline 2010
- Inpatient/outpatient same as adults
- Clinical diagnosis may be imprecise
  - cervical motion tenderness
  - uterine tenderness
  - adnexal tenderness

Interstitial Cystitis

- No Consensus Criteria
- Does consist of
  - Bladder epithelial dysfunction
  - Mast cell activation
  - Bladder outlet nerve up regulation
  - Dysregulation of sensory processing from spinal cord dorsal roots
Interstitial Cystitis – Presenting

- Frequency and dysuria
- Culture negative UTI, microscopic hematuria
- Sexual dysfunction is reported in up to 70% of females
- A history of sexual or physical abuse was noted in >50% of women in one cohort (Peters 2008)
- Trauma associated with abuse may be a trigger for myofascial or neuropathic pain found in many women with IC
- Risk factors: Caucasian females, smoking, food stimuli

Interstitial Cystitis

- Represents:
  - Chronic Inflammation
  - Sensory nerve overactivity
  - CNS over sensitization

Interstitial Cystitis (IC)

- C-fibers in the bladder urothelium and submucosa are activated or depolarized by potassium, thus causing pain
- Local mast cells release histamine, which in turn induces release of pain neurotransmitter substance P and induces proliferation of C-fibers
- Association with other pain conditions, environmental allergies, migraine headaches
- Associated with endometriosis- up to 81% in one cohort undergoing both laparoscopy and cystoscopy for CPP (Chung JSLS 2002)
Diagnosis of Interstitial Cystitis - History

- History of pain: 1. suprapubic, back, genital, vaginal, thighs. 2. vulvodynia or dyspareunia. 3. urinary frequency or irritative voiding
- Greater than 40% young women report exacerbation with menses or following intercourse
- Childhood or adolescent urinary retention or urgency or dysfunctional urinary or bowel habits
- Family history of IC

Diagnosis of IC - Exam Findings

- Tenderness to palpation of the bladder neck (19-96%), levator ani muscle tenderness (37%), suprapubic tenderness (32-50%), cervical motion discomfort (21%) (Teichman Urology 2007)
- Detection of myofascial trigger points in the rectus muscles or pelvic floor muscles

Interstitial Cystitis - Diagnosis

- Voiding Diaries may be helpful in detecting reduced bladder volumes and urinary frequency
- Mean voiding volume in women with IC 86-174 cc vs 289 cc in unaffected females with voids 17-25 times vs 6 in normal females (multiple studies)
Interstitial Cystitis - Diagnosis

- Questionnaires – none validated for diagnosis but can use to follow therapy
- Potassium Challenge Test
- Cystoscopy – NIH criteria 10 glomerulations in 3 of 4 quadrants, terminal hematuria

Intravesical Solutions for IC

- These solutions enhance the barrier effects of bladder surface mucus- may supplement oral therapies or use for “rescue” treatments
- Heparin 40,000 u in 10 ml water 1-2x/week
- Heparin best with Lidocaine 1-2%: with sequential instillation of 8.4% buffered Sodium bicarbonate to final vol of 10 cc
- Dimethly sulfoxide (DMSO)- 50-70% effective- only FDA approved intravesical therapy- anti-inflammatory, analgesic, muscle relaxant, collagen- degrading, bacteriostatic: 50 cc weekly x 6-8 wks- initially irritative
- Local drug delivery with limited efficacy in clinical trials
IC- Additional Therapies

- Dietary restriction: caffeine fruits, alcohol, tomato products, spicy foods, diet soft drinks
- Physical therapy - most effective in pelvic floor muscle spasm or levator ani myofascial pain
- Sacral Neuromodulation - somatic afferent inhibition of sensory processing - initial temporary electrode in S3 foramen
- Surgical resection of ulcerative lesions or bladder diversion

Therapy for Interstitial Cystitis

- Hydroxyzine, Cimetadine - antihistamines for controlling mast cell degranulation (10-25 mg po qhs and 400 mg bid respectively)
- Tricyclic antidepressants - amitriptyline, nortriptyline - inhibit upregulation of sensory nerves - 10-25 mg po qhs and titrate up

Gastrointestinal Causes of Chronic Pelvic Pain

- Constipation - infrequent BMs and dietary choices
- Inflammatory bowel diseases - often present during the adolescent years
- Food allergies - especially lactose or gluten intolerance
- Chronic appendicitis - initial symptoms may mimic a gastroenteritis, dyspepsia, or functional abdominal pain - often without any systemic findings of fever or elevated WBCs
Irritable Bowel Syndrome (IBS)

• 20 functional GI disorders - 15-20% adolescents may have some symptom compatible with this dx
• Defined as chronic abdominal pain (mainly lower quadrants) and disturbed defecation without structural or biochemical abnormalities.
• Pain relieved with defecation
• Symptoms must be present for at least 12 weeks over the last 12 months without weight loss
• Diagnosis of exclusion
**Other Causes of Abdominal Pain**

- Constipation
- Inflammatory Bowel Disease
- Lactose Intolerance
- Peptic Ulcer Disease
- Functional Dyspepsia or Abdominal Pain
- Adhesions

**Myofascial Pain in Adolescent Women**

- Pain: defined by Intl Association for the Study of Pain: unpleasant sensory and emotional experience associated with actual or potential tissue damage
- Pain is in the abd wall, anatomic pelvis, LS back or buttocks: sufficient to cause functional disability
- Nociceptive pain= generally “somatic” or “visceral” - usually thermal, mechanical or inflammatory
- Somatic pain= activation of nociceptors in superficial tissues- well defined, localized- skin, local, well defined), or tendons, ligaments, fascia, muscles (dull aching or poorly localized)
- Visceral pain= usually difficult to locate, often referred pain due to limited visceral afferents compared to somatic afferent pain

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Myofascial Pain

- 6-50% adolescents in studies with pain up to 3 mos, 25% > 3 mos.
- Prevalence greater in women, incidence rises appreciably at 12-14 years
- Trigger points- initial insult is trauma- with alteration of the sarcoplasmic reticulum and release of Ca++ ions causing a local contraction. Nutrients are diverted from adjacent muscle- producing de-functioned muscle and subseq weakness
- Myofascial can result from visceral disease (viscero-somatic reflex)

Clinical Evaluation of Chronic Pelvic Pain

- Cutaneous allodynia- “q-tip test”- primarily T10-L1 dermatomes- findings also positive in pts with endometriosis (bilateral) and IC (midline)
- Trigger Points- identified within areas of cutaneous allodynia- abd wall or perineum- most fre – R/L lower quad where abdominus m. meet ext oblique- best felt with flat finger areas- nodules or bands. Often appear to radiate to bizarre areas- back, chest, legs- pain projected through the fascia of the muscles
- Pain Threshold Measurement- careful clinical exam or dolorimeters

Clinical Assessment of Pelvic Pain

The Pelvic Diaphragm = the deepest muscle layer

Superior View of Female Pelvis
Support and Education

• Teens benefit from chat rooms, blogs, support groups

• www.youngwomenshealth.org

• Educational material for families is also available at that website

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