Approach to the Adolescent Female with Abdominal Pain

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Speaker Introduction

- Dr. Becky Carson is a certified pediatric nurse practitioner in primary and acute care and has spent a majority of her PNP career in emergency medicine. Dr. Carson credits her clinical experiences in resource-limited medicine in Tanzania and Haiti early in her career with her ability to use history and physical exam to guide medical decision making. She currently works at Cincinnati Children’s in the emergency department and is the director of Catholic University of America’s online PNP acute care post master’s certificate program.

Disclosures

I have no disclosures.

Learning Objectives

- Identify the most concerning post-menarche female abdominal presentations warranting acute management.
- Review management of common presentations of adolescent female abdominal pain.
- Review STI surveillance in the United States and implications for practice.
- Discuss the current STI guidelines from the CDC.

Why A Systematic Approach?

- Evaluation requires skill
  - History taking
  - Physical exam
- Pattern recognition may be difficult
- Clinical decisions take place before diagnostics return
- Broad differential diagnosis
  - Similar presentations for many etiologies
- Prevalence of atypical presentations

The 8 Step Guide to Girl’s Belly Pain
Step 1- Know Your Audience

- Anatomical
  - Surgical emergency vs benign
- Pubertal changes
  - New sensations vs organ dysfunction
- Lifestyle experimentation & environmental precipitants
  - Sex, drugs
  - Implantable devices
- Emergency services utilization

Step 2- Speak Their Language

- Development
- Poor historians
- Histrionic
- Somatization
- Emotional/Social Changes
- Thinking
- Vocabulary

Step 3- Ensure Privacy

- Interview in private
- Rights vary by state
- STI/HIV
- Prenatal care
- Begin with a normalizing statement
- Review the limits of confidentiality

Check out your state: www.guttmacher.org

(Yen et al., 2016)

Step 4- Gather History

- HPI
  - OPQRST of Pain
- Accompanying symptoms
- Menstrual History
  - Age at menarche, LMP, regularity, typical patterns and symptoms
- Sexual History
- PMH/SH
- Medications/Allergies

Pre Tip: Open ended questions are best, but for quiet patients, try specific close-ended but detailed questions.

Let’s Talk About Sex

At the initial visit, routine checkups, and with concern for STI

The 5 P’s of a Sexual History

- Partners
- Practices
- Protection
- Past STI/pregnancy
- Pregnancy Prevention

(CDC, 2019)
Step 5 - Physical Exam

- Attention to vital signs
- Abdominal
  - Inspection, Auscultation, Palpation, Percussion
  - Peritoneal signs
- Genital
  - External genitalia: Tanner stage, lesions, d/c
  - DRE if pertinent
- Pelvic
  - Speculum exam for inspection and STI specimen collection
  - Bimanual exam for CMT/Adnexal tenderness

Step 5 - Rule Out Pregnancy

When should you do a pregnancy test?

| All females starting at Tanner 2 |
| All females starting at Tanner 3 |
| All females starting at menarche |
| If there is suspicion in a young female with Tanner 2+ development |

   - B & D
   - C & D

Step 6 - Build Your Differential Diagnosis

- Gastrointestinal
  - Appendicitis, Volvulus, Mesenteric lymphadenitis, Constipation
- Gynecologic
  - Ovarian Torsion, Ovarian Cyst, Imperforate hymen, Ectopic pregnancy, PID, TOA, Dysmenorrhea
- Urologic
  - UTI, Renal stone
- Other infectious
  - Strep, Pneumonia
- Psychosomatic

Step 7 - Obtain Diagnostic Studies

**TESTS**
- Urine-
  - UA/Cx
  - STI- urine vs endocervical
- Serum-
  - CBC, CMP, GGT
  - Inflammatory markers
  - Thyroid panel

**IMAGING**
- Ultrasound- transvaginal vs abdominal + Doppler flow
- CT

Step 8 - Treat, Refer, and Follow Up

- Notification
- Partner Notification and expedited treatment
- Mandatory Reporting
- Test of cure
- Return to sex practices
- Return criteria

Pro Tip: Get permission to text results
Case 1:
- 13 yo female with 3 hours of “cramping” right lower quadrant pain that woke her from sleep.
- 10 episodes of emesis since onset of pain
- No fever
- LMP – 3 weeks ago; denies sexual activity ever
- Urine sample from triage – Negative HCG, 1+ leuks/no nitrites/no blood

Vitals

<table>
<thead>
<tr>
<th>Vitals</th>
<th>36.5</th>
<th>66</th>
<th>20</th>
<th>134/80</th>
<th>98%</th>
</tr>
</thead>
</table>

• PE: Gen: mod distress secondary to pain; Cardiac: Nml; Resp: Nml; Abd: TTP in RLQ and suprapubic area, +rebound tenderness

What would you do next?
- Abdominal Ultrasound
- Transvaginal Ultrasound
- CT
- Pelvic speculum/bimanual exam with STI testing

You obtain an ultrasound, which reveals this:

What is the diagnosis?
- Ovarian teratoma
- Hemorrhagic ovarian cyst
- Ovarian torsion
- Tubo-ovarian abscess

Ovarian Torsion: Pathophysiology

[University of Colorado, 2019]
Ovarian Torsion:

**SIGNS/SYMPTOMS**
- Sudden onset of severe lateral pain
- N/V
- Fever (late) indicates necrosis

**PHYSICAL EXAM**
- Severe focal tenderness
- + rebound
- Unilateral mass

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**Ovarian Torsion: Diagnosis**

- Finding suggestive of ovarian torsion:
  - Ovarian enlargement (4+ cm)
  - Ovarian Edema
  - Multiple small peripheral follicles or “string of pearls”
  - Pathognomonic US sign is “whirlpool sign”
  - Doppler Flow
    - Normal Doppler with arterial flow in 2/3 of patients with torsion

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**Ovarian Torsion: Management & Outcomes**

- Supportive care
  - IV fluids
  - Pain control
- Emergent GYN consult
- Laproscopy with detorsion
  - Preserves ovarian viability

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**Take Home Point**

- A normal US with Doppler flow does not rule out ovarian torsion.

<table>
<thead>
<tr>
<th>Ultrasound result</th>
<th>Patient with ovarian torsion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>96.9% 0.4%</td>
</tr>
<tr>
<td>Negative</td>
<td>27.9% 95.9%</td>
</tr>
</tbody>
</table>

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**Case 2**

- 16 yo F sexually active w/ multiple partners presents with worsening L pelvic/abdominal pain x 2 days.
- Has been feeling dizzy with nausea/vomiting for about 1 wk
- Hx of chlamydia PID about 6 months ago, treated with outpatient abx.
- 3 weeks late for her LMP but started bleeding today
- No condom use, no contraception

<table>
<thead>
<tr>
<th>Vitals</th>
<th>37.7 110 14 90/66 99%</th>
</tr>
</thead>
</table>

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**What concerns you most?**

- Dizziness with nausea/vomiting
- Started her period today
- Mild tachycardia
- No condoms or contraception with multiple partners
- Hx of PID
Case 2 continued...

- Urine hcg +
- Urine sent for GC/CT

- Physical exam:
  - Abdomen: Soft, tender to palpation in the LLQ, Palpable L adnexal mass. +rebound tenderness. No HSM.
  - GU: External exam without lesions, blood pooled at introitus. Deferred speculum and bimanual due to pain.

Sent to ultrasound...

Ectopic Pregnancy

- Statistics:
  - 2% of pregnancies
  - Leading cause of 1st trimester M&M
  - 10% of maternal deaths
  - 10% are adolescents
  - 16% of females in the ED with first trimester bleeding/pain

Source: Mayo Clinic

Ectopic Pregnancy

- Most commonly in the fallopian tube
  - Predisposed by PID, tubal surgery, previous ectopic pregnancy
  - NOT associated with IUD use

Source: Mayo Clinic

Ectopic Pregnancy: Diagnosis & Management

- + serum quant hCG + absense of intrauterine pregnancy
  - Transvaginal US
  - ? Inconclusive results require further workup
  - Serial serum hCG

- Management
  - Emergent transfer to adult center/OR in hemodynamic instability
  - GYN consult for unruptured

(Goyal et al., 2015)
Take Home Point

• Transvaginal US should be the initial imaging test in pregnant women with acute pelvic pain.

(Bhavsar et al., 2016)

Case 3

• 15 yo F w/ lower abd pain x 1 wk presents to the ED
• Pain is midline, pelvic, worse with movement.
  • Walks to the exam table hunched with short steps
  • Improved with lying down, sleep.
• ROS:
  • + Nausea, no vomiting, no diarrhea
  • “felt warm” but no measured temp
  • Malodorous vaginal discharge
  • +dysuria, no hematuria/frequency/urgency

Case 3 cont’d

• LMP ~ 3 weeks ago, unremarkable, menarche at 11
• Urine hCG negative from triage
• Sexual hx:
  • 1 male partner, 2 others since last year
  • Vaginal intercourse
  • No condoms, no other barrier methods
  • Last tested 1 year ago, +GC/CT, treated outpatient by adolescent medicine
  • No contraception

Case 3 cont’d

• PE:
  • VS normal
  • General: A&O, nontoxic appearing
  • Abd: soft, flat, diffusely tender in lower abdomen, L>R, +BS x 4 quad, no HSM
  • GU: External exam- Tanner 5 with shaved pubic hair, no external lesions.
  • Milky discharge from the introitus.
  • Bimanual exam- +CMT, L adnexal tenderness with small palpable mass
  • Speculum exam- Cervix friable with mucopurulent discharge

Case 3: PID with TOA

Statistics:

1 million cases annually
20% are adolescents
CT in up to 60% of cases
Most serious complication: TOA

CDC Recommendations

• Maintain a low threshold for the diagnosis of PID.
• Presumptive treatment if sexually active + lower abd/pelvic pain
  • If no other cause for the pain is identified
    • AND CMT +/- uterine tenderness +/- adnexal tenderness
• Send GC/CT tests, empirically treat
• IUDs can stay in place
**PID Treatment**

<table>
<thead>
<tr>
<th>OUTPATIENT</th>
<th>INPATIENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceftriaxone 250 mg IM x 1</td>
<td>Cefotetan 2g IV q 12h</td>
</tr>
<tr>
<td>AND</td>
<td>AND</td>
</tr>
<tr>
<td>Doxycycline 100 mg PO BID x 14 days</td>
<td>Doxycycline 100 mg PO q 12h</td>
</tr>
<tr>
<td>Cefotaxin 2g IM x 1 AND probenecid 1g PO given concurrently</td>
<td>Cefotaxin 2g IV q6h AND Doxycycline 100 mg PO q 12h</td>
</tr>
<tr>
<td>Doxycycline 100 mg PO BID x 14 days</td>
<td>Clindamycin 900 mg IV q8h AND Gentamicin 2mg/kg loading dose IV/IM followed by maintenance 1.5 mg/kg q8h</td>
</tr>
<tr>
<td>May include metronidazole 500 mg PO BID x 14 days</td>
<td></td>
</tr>
</tbody>
</table>

(May include metronidazole 500 mg PO BID x 14 days)

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**Take Home Point**

Sexually Active Female w/ abd/pelvic pain?
- Yes
- No

CMT/ adnexal tenderness
- Yes
- No

Another cause of pain identified?
- Yes
- No

Not PID

Treat presumptively for PID!

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**Sexually Transmitted Infections Surveillance 2018**

From the Centers for Disease Control and Prevention

- 34% (or more) of high schoolers are sexually active
- 20 million new STIs each year
  - Adolescents ages 15-24 contract 50% of STIs
  - 1 in 4 female adolescents have an STI
  - Increase risk of HIV transmission
  - Long term health consequences
- $17 billion in medical costs annually

(Weisman et al., 2019; Masonbrink et al., 2018; CDC, 2019)

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**Chlamydia — Females Aged 15–24 Years, 2018**

- 1.8 million new cases*

(19%)

(Weisman et al., 2019; CDC, 2019)

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**Gonorrhea — Females Aged 15–24 Years, 2018**

- 583,405 new cases*

(63%)

(Weisman et al., 2019; CDC, 2019)
RISK ASSESSMENT
- Yearly STD screening:
- CT/GC
- HIV for at-risk populations
- Certain STD’s only if symptomatic (BV, trich, syphilis, HSV, HPV, hepatitis)

PREVENTION
- Vaccination
- Emergency Contraception
- Re-testing after positive results
- Expedited Partner Therapy

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Highlights
- Chlamydia Cervicitis
- Clinical diagnosis
  - Assess for PID
  - Send GC/CT, trich, BV, syphilis, HIV
  - Presumptive treatment for high risk or poor f/u patients
  - Abstain from sex
  - 7 days post tx
  - Azithromycin 1 g PO x 1
  - OR
  - Doxycycline 100 mg PO BID x 7 days
  - *Consider gonorrhea treatment too

Highlights- Gonorrhea
- Growing resistance, cefixime not recommended
- Direct observation therapy
- Test of cure for pharyngeal gonococcal infection
  - Ceftriaxone 250 mg IM x 1
  - AND
  - Azithromycin 1 g PO x 1

Highlights
- Primary HSV Infection
- All should receive antiviral therapy due to possibility of prolonged/severe symptoms
  - Episodic treatment
  - Initiate within 1 day

Highlights- Bacterial Vaginosis
- Gold standard: Dx with gram stain
- Clinical dx:
  1. Thin white d/c
  2. Clue cells
  3. pH >4.5
  4. +Whiff test
- Metronidazole: 500 mg PO BID x 7 d
  - OR
  - 0.75% gel, 1 app vag daily x 5 d
  - OR
  - Clindamycin 2% cream, 1 app vag QHS x7d

Highlights- Trichomons
- Highly increases risk of HIV acquisition
- Nucleic acid amplification test > wet mount
- Presumptive partner treatment
- Follow up testing within 3 months
- Metronidazole 2g PO x 1
  - OR
  - Tinidazole 2g PO x 1
  - OR
  - Metronidazole 500 mg PO BID x 7 days
Let’s Review the 8 Steps

1. Know your audience
2. Speak their language
3. Ensure privacy
4. Gather history
5. Physical exam
6. Build a differential diagnosis
7. Diagnostic studies
8. Treat, refer, follow up, educate

Questions? Comments?
Contact Becky Carson: carsonr@cua.edu

References