Approach to Acute Arthritis in Kids

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Disclosures

• Abbivie
  – STRIVE - JIA Registry
• Eli Lilly
  – Illuminate – SLE clinical trial
What we will talk about…

• Arthritis Overview
• Clinical Evaluation
• Differential Diagnosis
• Diagnostic Evaluation
• Treatment & Referral Pearls
Arthritis

Greek *arthron* = joint
- *algia* = pain
- *itis* = inflammation

Incidence – 5-10 per 100,000 children aged 16 years or younger
Arthritis

Swelling or effusion

OR two or more:

Limited range of motion

Tenderness or pain on motion

Increased heat
Underlying Etiology

1) Trauma / Mechanical

2) Acute bacterial infection

3) Subacute bacterial infection

4) Inflammatory
   Reactive to infection
   Not infection related

5) Malignancy
**HPI: Investigate “The 5 Ws”**

<table>
<thead>
<tr>
<th>W</th>
<th>Prompt</th>
<th>Pearl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who</td>
<td>age &amp; gender</td>
<td>clue to cause</td>
</tr>
<tr>
<td>What</td>
<td>describe joints</td>
<td>pain, palliation, provoking</td>
</tr>
<tr>
<td>When</td>
<td>onset and timing of symptoms</td>
<td>migratory or non-migratory</td>
</tr>
<tr>
<td>Where</td>
<td>which joints</td>
<td>size, symmetry</td>
</tr>
<tr>
<td>Why</td>
<td>pt or family’s suggested cause</td>
<td>trauma can be a</td>
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Review of Systems

• **Systemic**: fevers, weight loss
• **Skin**: rashes, sun sensitivity, wounds, hair loss
• **HEENT**: preceding URI, sore throat, mouth ulcers, conjunctivitis
• **Chest**: pleuritis, chest pain (serositis)
• **GI**: diarrhea
• **MSK**: morning stiffness, back pain, heel pain
History and Physical

- **PMH** especially history of joint problems
- **Family history** of autoimmune disease, arthritis
- **Social history:** travel, exposures
- Examine all systems and perform a complete joint exam!!
Trauma / Mechanical

• Soft tissue injury
  – Ligament sprain or tear
  – Meniscal tear
  – Chondromalacia, osteochondritis dissecans, patellofemoral syndrome
• Fracture or stress fracture
• Hips: Perthes, SCFE
• Hemarthrosis
Acute Bacterial Infection

• Septic joint or bursa
• Osteomyelitis with infected joint or with sympathetic effusion
• Important characteristics:
  – Extreme pain
  – Very warm, sometimes red
  – Refusal to bear weight or walk
• Must tap joint
Subacute Bacterial Infection

- Lyme – late sign, acute, intermittent, mono (knee) or oligo, not so painful
- TB – indolent, oligo
- Primary syphilis – bone invasion
- Secondary syphilis – symmetric knees
- Brucellosis – hip or knee monarthritis, SI
- Salmonella – sicklers
- Bartonella – long bone osteo
Inflammatory Arthritis

• Reactive arthritis
  – Acute rheumatic fever
  – Other bacterial “reactive arthritis”
  – Viral reactive arthritis
  – Immunization associated arthritis (Rubella)

• Systemic inflammatory condition
  – SLE
  – Dermatomyositis
  – Vasculitis

• Juvenile idiopathic arthritis
Reactive Arthritis

• “Classic” reactive arthritis
  – Gonococcal, Chlamydia
    • migratory or additive
    • tenosynovitis
  – Enteric bacterial infections
    • Yersinia
    • Salmonella
    • Shigella
    • Camphylobacter

• TB reactive arthritis (polyarthritis)
• Post-streptococcal arthritis
Systemic Infectious Disease

- Viral reactive arthritis
  - Toxic (transient) synovitis of hip
    - Acutely painful arthritis
    - Post URI
    - High inflammatory markers
    - Aseptic tap
  - Nonspecific transient arthritis
    - Post-viral
    - Serum sickness-like reactions due to immune complexes
  - Parvo, mycoplasma, EBV, many others
  - Hepatitis prodrome
**Systemic Inflammatory Conditions**

- **Vasculitis**
  - Henoch Schonlein purpura
    - Migratory para-arthritis, painful
  - Kawasaki
    - Swollen hands and feet
- **Serum sickness (antibiotics)**
- **Systemic connective tissue diseases**
  - Lupus
  - Dermatomyositis
Juvenile Idiopathic Arthritis

• Arthritis for at least 6 weeks

• Diagnosis of exclusion

• Onset type defined by type of disease in first 6 months
<table>
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<tr>
<th>Subtype</th>
<th>% of JIA</th>
<th>Age</th>
<th>Sex</th>
<th>Symm</th>
<th>Joints</th>
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<tbody>
<tr>
<td>Systemic</td>
<td>Some</td>
<td>All ages</td>
<td>F=M</td>
<td>S or A</td>
<td>Any - all, severe</td>
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<tr>
<td>Poly RF+</td>
<td>least</td>
<td>Adolescent</td>
<td>F&gt;&gt;M</td>
<td>S</td>
<td>All, severe</td>
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<tr>
<td>Poly RF-</td>
<td>many</td>
<td>Preschool &amp; Elementary</td>
<td>F&gt;&gt;M</td>
<td>S</td>
<td>Any</td>
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<tr>
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<td>most</td>
<td>Preschool</td>
<td>F&gt;&gt;&gt;M</td>
<td>A</td>
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<tr>
<td>Psoriatic</td>
<td>few</td>
<td>Preschool &amp; Late Elementary</td>
<td>F&gt;M</td>
<td>A</td>
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<tr>
<td>ERA/HLA-B27</td>
<td>few</td>
<td>Boys &gt; 8</td>
<td>M&gt;&gt;F</td>
<td>S or A</td>
<td>Axial, hips</td>
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</table>
Systemic JIA

• Polyarticular arthritis
  – Large & small joints, usually symmetric
  – 10% no joint involvement at presentation

• Evanescent rash
  – Salmon colored macules or patches
  – Trunk, proximal extremities, axilla, groin
  – Appears with fever

• Spiking quotidian fever that breaks

• HSM, lymphadenopathy, serositis

• Can progress to life threatening
  – MAS (macrophage activation syndrome)
Malignancy

• Suspect if:
  – constitutionally unwell, pain out of proportion
  – bone tenderness rather than tenderness limited to the joint line
  – profound anemia or cytopenia
  – if platelets are normal with high esr
  – High LDH

• Leukemia
• Neuroblastoma
• Bone tumors
Diagnostic Investigations
Joint Aspiration

• Must do when cannot bear weight, extremely painful joint with fever
• Most common: knee & hip
• Synovial fluid analysis
  – Signs of infection: WBCs >50 or 100,000, low glucose, high protein
  – Positive findings cannot definitively distinguish septic from non-infectious
  – Gram stain and culture can be negative in 30-40% of infected joints
Imaging

- X-rays
- Ultrasound
- MRI
- Bone scan
Labs

- **Infectious workup**
- **CBC**: anemia, leukocytosis, thrombocytosis
- Elevated **ESR, CRP, ferritin**
- Elevated **LFTs**
- Signs of DIC: prolonged coags, D-dimers, low fibrinogen
- **UA**
  - proteinuria/hematuria
ANA and RF

• Positive ANA/RF: not diagnostic for any rheumatic condition

• Negative ANA/RF: does not rule out any rheumatic condition

• ANA confers risk for uveitis in oligoarthritis

• Rheumatoid factor in setting of chronic polyarticular arthritis confers risk for erosive arthritis
Arthralgias

Arthralgia = joint pain without inflammation

- Growing Pains
- Psychogenic rheumatism
  - Conversion disorder
  - Malingering
  - Depression, Anxiety
- Reflex neurovascular dystrophy
  - Reflex sympathetic dystrophy
  - Complex regional pain syndrome
  - Juvenile Fibromyalgia
- Benign joint hypermobility
- Hereditary connective tissue disease
  - Erlos Danlos
  - Marfans
- Cystic Fibrosis
Treatment & Referral Pearls
Arthritis in Children

- YES fever/sick
  - single
    - Septic arthritis
  - many
    - acute
      - JIA, SLE, JDM
    - chronic
      - JIA, SLE, JDM
    - migratory
      - Lyme
      - Rheumatic Fever
      - GC
    - non-migratory
      - Vasculitis

- NO
  - single
    - acute
      - Trauma
      - Toxic synovitis
  - many
    - chronic
      - Lyme
      - Oligo JIA
  - Lyme?
  - Oligo JIA
  - TB
  - Fungal
  - Tumor
  - Sickle cell
  - Hemophilia
  - Tumors
Initial Management of Arthritis

• Evaluate for infection, consider malignancy, get imaging & basic labs

• Symptomatic treatment: NSAIDs
  – Ibuprofen 10 mg/kg/dose 3-4 times daily
  – Naprosyn 10 mg/kg/dose twice daily
  – Ice & heat

• Avoid steroids

• No need to limit activity unless orthopedic concerns

• Send to ER if concerned about septic joint

• Consider ortho consult if trauma

• Refer to rheumatology
  – symptoms > 4 weeks
  – no identifiable non-rheum cause
Initial management of chronic non-arthritis joint pain

• Physical therapy
• NSAIDs, Acetaminophen – avoid narcotics
• If concern for depression/anxiety or parental factors refer to counseling/psychiatry
• Work on adequate sleep duration and quality
• Address mechanical factors
  – Flat feet – podiatry, shoe inserts
  – Obese – weight management
  – Hypermobility – bracing, strengthening, avoid high impact activities, consider genetics consult
Urgent vs Non-urgent

• 5 y/o girl with high fever, evanescent rash, joint pain. Strep screen and other infectious work up neg. WBC, PLT, ESR, CRP elevated

• 14 y/o AAF with malar rash, arthralgias, fevers, fatigue. Low wbc, hgb, plt. UA shows trace protein & blood. ANA 1:2560

• 13 y/o with depression & insomnia complains of several year history of 10/10 joint pain, sitting calmly & smiling. ANA 1:40, all other labs normal. Mother who is a nurse with pmhx of fibromyalgia is frantic and demands to know what’s wrong with her daughter.
Semi-Urgent vs Non-urgent

- 14 y/o male with back pain worst in the morning, improves with ibuprofen and exercise. Father has psoriasis.

- 3 y/o female with asymptomatic swelling of the left knee. She will occasionally limp in the morning but does not complain of pain or exhibit any physical limitation. Mom notices she squints when lights are turned on. She was diagnosed with “pink eye” a few months ago.
  - Send to pedi-ophtho urgently

- 12 y/o with pmhx chronic constipation c/o exercise induced arthralgias, frequent ankle sprains and clumsiness, occasional mild knee swelling after vigorous exercise and had to quit gymnastics.

- 10 y/o obese male with knee and ankle pain. Exam reveals flat feet and mild valgus knee deformity
References

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• Its Not Just Growing Pains, Thomas Lehman, MD
• American College of Rheumatology Image Bank
Acknowledgments

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