

# **Ankylosing Spondylitis**

## **Background**

1. Definition
  - Ankylosing Spondylitis (AS) is characterized as a spondyloarthropathy manifested by back pain and progressive stiffness of spine
  - Chronic inflammatory condition involving the axial skeleton (sacroiliac joint and spine) primarily
    - Peripheral joint and extraarticular involvement is also common
2. General info
  - Affects mostly males aged 15-40 years<sup>1</sup>
  - Associated with HLA-B27<sup>1</sup>
  - Insidious onset of back pain<sup>1</sup>
  - Enthesitis

## **Pathophysiology**

1. Pathology of disease<sup>2</sup>
  - Immune mediated process, not completely understood
  - Thought to originate at the site of tendon, ligament, and other bony attachments
  - HLA B27 involved
  - Exact mechanism unknown
  - Unknown trigger
    - Enteric bacteria (Klebsiella) thought to play role
2. Incidence/ prevalence
  - Most common spondyloarthropathy<sup>3</sup>
  - 0.1-0.2% of general U.S. population affected<sup>3</sup>
3. Risk factors
  - Age
    - 15-40 years of age
  - Race
    - Whites most affected group
  - Sex
    - Males affected more than females 3:1
  - HLA-B27
    - 90-95% of patients are positive
  - Family history
    - Increased risk if there is a 1st-degree relative with AS (10-30%)<sup>2</sup>
  - Increased risk with FH of inflammatory bowel disease (IBD)<sup>4</sup>
  - Twin concordance: 65%<sup>2</sup>
4. Morbidity / mortality
  - Morbidity
  - Enthesitis - inflammation along tendon/ligament bone insertion
  - Dactylitis - inflammation of a digit
  - Acute anterior uveitis
    - Most common complication (25-30%)
    - 50% of patients have AS

- Ulcerations
  - Ileal, and colonic
  - Usually asymptomatic; can progress to IBD
- Cardiovascular disease
  - Aortic regurgitation, AV blockade, mitral regurgitation
- Upper lobe fibrosis
- Amyloidosis, IgA nephropathy
- Prostatitis
- Osteopenia
- Neurologic symptoms
  - Nerve compression due to spinal deformity
  - Cauda equina syndrome
  - Spinal fracture
- Mortality
  - Mortality up to 1.5x greater in hospitalized patients<sup>5</sup>
  - Secondary amyloidosis and cardiovascular complications most common cause of death<sup>5</sup>

## Diagnosics

### 1. History

- Buttock pain
  - Referred from SI joint
- Back pain (first symptom in majority of patients)
  - Insidious onset, dull in character
  - Worse in the morning and with inactivity, improve with exercise but not with rest
  - Nocturnal back pain awakening patient at night<sup>6</sup>
- Limited spinal mobility
- Enthesitis
  - Common sites
    - Achilles tendon insertion on calcaneus (heel pain)
    - Plantar fascia attachment on calcaneus (foot pain)
    - Tenderness along costochondral junctions, manubriosternal, sternoclavicular joints, superior iliac crest, tibial tubercles<sup>2,3</sup>
  - TMJ involvement
  - Peripheral arthritis
- Can involve one or multiple joints
  - Hip/shoulder pain
  - Constitutional symptoms: fatigue

### 2. Physical exam

- Stooped posture
- Stiff back
- Bilateral sacroiliac tenderness & limited lumbar spine motility
- Limited cervical motion
- Limited spinal mobility<sup>3</sup>
  - Flattening of lumbar lordosis
  - Exaggeration of thoracic kyphosis

- Hyperextension of cervical spine
    - Limited flexion, extension, lateral flexion, rotation
  - Schober test<sup>3</sup>
  - Limited chest wall expansion
    - <3 cm difference between min and max chest diameter
  - Uveitis
  - Enthesitis
- 3. Diagnostic testing
  - Laboratory evaluation
    - CRP, ESR
      - Elevated in 50-70% of patients<sup>3</sup>
    - Rheumatoid Factor (RF), Antinuclear Antibody (ANA)
      - Negative
    - HLA-B27 help determine likelihood but not diagnostic
  - Diagnostic imaging
    - X-ray (Pelvis)<sup>8</sup>
      - May be normal within first few years
        - Only 40% have evidence of sacroiliitis after 10 years<sup>7</sup>
      - Bilateral sacroiliitis
      - Bony erosions and sclerosis
      - Ankylosis (stiffening/consolidation) of joints
    - Erosions and osteitis
    - X-ray (Spine)<sup>8</sup>
      - Vertebral body "squaring"
      - Marginal syndesmophytes formation
      - "Shiny corners"
        - Areas of small erosions along the superior and inferior edge of the anterior margin of vertebral bodies
      - Anterior subluxation of C1-C2
      - Ankylosis of facet joints
      - Spinal fusion ("bamboo spine" appearance on x-ray plain film)
    - MRI
      - More sensitive than plain radiograph
      - Indicated only with high suspicion in presence of negative plain radiograph<sup>9</sup>
- 4. Diagnostic "Criteria"
  - Modified New York Criteria (1984)
    - AS is present if the radiologic criterion is present in addition to at least one clinical criterion
    - Probable ankylosing spondylitis is present if 3 clinical criterion are present alone or if the radiologic criterion is present but no clinical criteria are present<sup>12</sup>
  - Clinical criteria
    - Low back pain: present for more than 3 months, improved by exercise but not relieved by rest

- Limitation of lumbar spine motion in sagittal and frontal planes
- Limitation of chest expansion relative to normal values for age and sex
- Radiologic criterion
  - Sacroiliitis on radiographs

### **Differential Diagnosis**

1. Key differential diagnoses
  - Psoriatic arthritis
  - Reactive arthritis
  - IBD associated spondyloarthropathy
  - Undifferentiated spondyloarthropathy
  - Tuberculous spondylitis
  - Diffuse idiopathic skeletal hyperostosis
  - Herniated disc
2. Extensive differential diagnoses
  - Rheumatoid arthritis
  - Osteoporosis
  - Amyloidosis

### **Therapeutics**

1. Smoking cessation<sup>10</sup>
2. Physical therapy/exercise program
3. NSAIDs (SOR:C)<sup>3</sup>
  - 1st line treatment for symptomatic dz
4. TNF-alpha antagonists (SOR:2B)<sup>3</sup>
  - Etanercept, Infliximab, Adalimumab
  - Majority of patients respond to one of the above<sup>11</sup>
5. DMARDs
  - 2nd-line therapy for ankylosing spondylitis
  - Sulfasalazine (SOR:2B)<sup>3</sup>
    - Usually for patients with peripheral arthritis
  - Methotrexate
    - Evidence lacking
    - Patients with prominent peripheral arthritis<sup>3</sup>
6. Pamidronate
7. Steroid injections
8. Surgery
  - Total hip replacement
  - AS patients with severely limited hip mobility or pain
  - Cervical fusion
  - AS patients developing C1-C2 subluxation with neurologic function
  - Wedge osteotomy

### **Follow-Up**

1. Referrals
  - Consider rheumatology referral
  - Acute Anterior Uveitis: refer to ophthalmologist

2. Admit to hospital
  - Based on development of complications

### **Prognosis**

1. Highly variable
2. Worse prognosis
  - Hip arthritis, dactylitis, poor response to NSAIDs, early onset, cigarette smoking, increasing radiographic changes, males etc.

### **Patient Education**

1. <http://www.spondylitis.org/about/as.aspx>

### **Evidence-Based Inquiry**

1. Are DMARDs effective for rheumatologic diseases besides rheumatoid arthritis?

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