KAWASAKI DISEASE - DIAGNOSIS AND TREATMENT

Division of Cardiology

The treatment of Kawasaki Disease (KD) is evolving and subject to change. The preferred location of care of patients with KD is in a pediatric tertiary care center where evaluation and Pediatric Cardiology consultation is obtained, initial therapy begun and long term follow up is arranged. In any setting, physicians caring for these patients should recognize that KD is a multisystem inflammatory disease and that all patients, even those without coronary artery disease, have myocarditis, and are subject to multiple complications. The initial goal of therapy is to stop the inflammatory immune response.

CLASSIC CRITERIA FOR KAWASAKI DISEASE.

1. Fever (5 days or longer)

2. Four of the following criteria:
   a. Conjunctival injection
   b. Oral membrane changes (any of the following)
      - injected or fissured lips
      - injected pharynx or buccal mucosa
      - strawberry tongue
   c. Rash
   d. Extremity changes (any of the following)
      - erythema of palms or soles
      - edema of hands or feet
      - desquamation
   e. Cervical lymphadenopathy (1.5 cm.)

3. Treatment is not based upon echocardiographic findings.

Atypical Kawasaki Disease (occurs frequently):

   a. Fever, intermittent and often greater than 5 days.
   b. Minimal adenopathy.
   c. Vague and transient skin rash.
   d. Prominent G.I. symptoms.
   e. Actual criteria for KD may be met but are spread out over a longer than usual time frame.
      Attention to details and history will provide the best clues in this group of patients.
   f. Consult Cardiology. Consider IVIGG if there is strong data to support diagnosis of KD.

Cardiac Implications.

1. **Acute phase** (0 to 13 days): dysrhythmias, pericarditis, myocarditis, cardiac failure, valve damage, extremity gangrene. The most severe form of KD may develop coronary abnormalities in the first few days.

2. **Subacute phase** (14 to 25 days): aneurysm development with thrombosis or rupture of coronary, cerebral or mesenteric or peripheral arteries.

3. **Convalescent phase** (25 days +): aneurysm thrombosis or healing with possible stricture resulting in myocardial, cerebral or mesenteric infarction.
RECOMMENDED DRUG THERAPY:

1. **IV gammaglobulin (IVIG) therapy**: Upon diagnosis, IVIG is initiated at 2 gm/kg x 1 dose over 12 hours. Volume overload (CHF), especially in small infants, can be a complication. IVIG therapy is of uncertain value after 10 days of illness. Repeat IVIG if fever persists for 36-48 hours after completion of first course, or if CRP does not begin to drop.

2. **Acetyl salicylate (aspirin) therapy.** "High Dose" (50-100 mg/kg/day divided qid) for minimum of 24 hours. Decrease to “Low Dose” (3-5 mg/kg/day) for 4-6 weeks once afebrile and inflammatory indices (especially CRP) are found to be decreasing. Low Dose aspirin therapy should be continued indefinitely if coronary artery aneurysms have been present.

3. **Prednisone therapy.** Administer prednisone 2 mg/kg/day x 5 days if CRP is still elevated, or fever persists 48 hours after completion of second IVIG course.

4. **Ranitidine.** Use during period of administration of High Dose ASA for GI prophylaxis.

MONITORING:

1. **Hospitalization.**
   a. Thorough initial evaluation and work-up, including CBC, CRP, ESR, ASO titer, LFTs, UA (and micro) and throat culture.
   b. Pediatric Cardiac consultation with performance of Electrocardiogram and Echocardiogram. **No Echo will be performed in patient with question of KD without a consultation.**
   c. Remember to examine the femoral and axillary arteries for aneurysms.
   d. Minimum of 48 hours of hospitalization after IVIG (unless reliable next-day follow up by PMD can be assured).
   e. Salicylate levels should be followed if high dose ASA is continued beyond 72 hours.
   f. Repeat platelet count, CRP, ESR prior to discharge.

2. **Routine Follow-up (of the uncomplicated patient).**
   a. Communicate with PMD prior to discharge as to indications for early reevaluation.
   b. Electrocardiograms/Echocardiograms at:
      1. 10-14 days after discharge.
      2. 6 weeks from onset of illness.
      3. 6 months from onset of illness.
      4. 12 months or longer depending on cardiology consultant.
   c. Laboratory evaluation: ESR, quantitative CRP (ESR may be invalid due to IVIG), CBC with differential and platelet count, other variables may be followed (in select instances) at the time of echocardiography.
   d. PMD follow-up in 48-72 hours.
   e. Cardiology follow-up in 10-14 days (at time of acquisition of repeat Echo/EKG).

Reference:

Dajani, A.S. et al, Diagnosis and Therapy of Kawasaki Disease in Children. Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease, Council on Cardiovascular Disease in the Young. American Heart Association Publication, 10/12/92. (In Housestaff Teaching File.)

*(Kawasaki Disease – Dr. Lewin – Rev. 3/05)*
Children’s
Hospital & Regional Medical Center

Guideline of care for Diagnosis and Management of Kawasaki Disease
- Complete and Incomplete Case
- Long-term followup Pathway
- Recurrent / Resistant Kawasaki Disease Pathway
- Kawasaki Disease Clinical Pathway

Child Admitted with Suspicion of
Kawasaki Disease
Enter Clinical Path

Complete Case:
- Fever > 4 days, plus at least 4 of:
  - conjunctivitis
  - lymphadenopathy
  - rash
  - changes of lips or oral mucosa
  - extremity changes

Incomplete Case:
- Fever < 4 days
  OR
- Fewer than 4 criteria

Note: All elements need not be present simultaneously for a diagnosis of "complete" KD. Careful history may elicit evidence of antecedent clinical criteria. Cases may also become "complete" over time.

Standard Lab Set
- CBC with differential, ESR, CRP; blood culture.
- Red top to KULD
- Urinalysis
- Viral FA & culture by nasopharyngeal swab (nasal wash if rhinorrhea present)
- Consider: ASO and/or throat culture (to beta-hemolytic strep)

Enter Recurrent / Resistant KD Pathway

Discharge Criteria
- Met within 48 hours?
  - Yes
  - No

Enter Long Term Follow-up Pathway

Treat KD!
- Yes
- No

Obtain echocardiogram AND cardiology consult
- Yes
- No

Treat as KD!
- Yes
- No

Must have:
1) alternate diagnosis
OR
2) > 48 hours of inpatient observation
AND
reliable follow-up with PMD within 48 hours of hospital discharge

FORM # 52156 (6/03)
Discharge Criteria: (children treated for KD) must meet all

1. Observed 12-24 hours in hospital after completion of IVIG infusion.
2. Afebrile 18-24 hours prior to discharge.
3. All other clinical criteria used for diagnosis are documented to be improving.
4. Echocardiogram & cardiology consult are complete.
5. Parent education is complete.
6. Community provider has been contacted, discharge instructions and indications for return have been faxed to PMD and child has appointment with provider within 72 hours.
7. Initial cardiology follow-up is scheduled.

---

CAA = Coronary Artery Aneurysms (6/03)

---

*(Kawasaki Disease – Dr. Lewin – Rev. 3/05)*
RHEUMATIC DISEASES:

A. Approach to the child with musculoskeletal pain:
   Differential diagnosis; clinical clues; helpful tests

1. INFECTIONS: Could this be an infection in bone or joint – fever, toxic looking, severe pain, guarding, loss of function (e.g., not walking, not using extremity).
   Consider host factors (age, sexual activity, sickle cell, immunosuppression; previous antibiotic treatment may modify acuity, travel to Lyme endemic area, TB exposure).
   Must aspirate / image (U/S, bone scan, MRI); blood cultures, CBC, ESR, CRP, PPD
   Treat empirically before cultures are back – joint needs to be drained, esp hip.

2. POST INFECTIOUS: post viral, post strep ( includes rheumatic fever)

3. MALIGNANCIES: a. local (e.g. osteogenic sarcoma)
   b. systemic, e.g., leukemia, lymphoma
   Pain out of proportion to physical findings; pain at night; pain at rest
   Imaging; CBC; ESR, CRP, LDH/uric acid (catecholamines), marrow.

4. SYSTEMIC INFLAMMATORY DISEASES e.g., Crohn’s, ulcerative colitis
   Dropping off growth curve; occult blood in stool, low albumin

5. “ORTHOPEDIC” CAUSES, i.e., noninflammatory /mechanical problems
   Usually no morning stiffness; symptoms increase with activity
   Trauma – can be red herring (but don’t forget abuse)
   Avascular Necrosis
   Slipped Capital Femoral Epiphysis
   Hypermobility
   Patello-femoral syndrome (chondromalacia)
   (many others)
   Imaging helpful; labs usually normal

6. METABOLIC/GENETIC CAUSES
   Gout rare in childhood (inborn error); tap the joint
   Hemophilia/ Fe deposition
   Immune deficiency syndromes
   Syndromes e.g. Sticklers, epiphyseal dysplasias; storage diseases
   Sarcoid

7. PAIN AMPLIFICATION SYNDROMES
   Fibromyalgia: pain but normal physical exam; sleep disturbance; trigger points
   Reflex sympathetic dystrophy: cool, hypersensitive extremity.

8. RHEUMATIC DISEASES
   All can present with arthritis
   Juvenile Arthritis (see below)
   Psoriasis related arthritis
   Spondyloarthopathies
   Systemic Lupus Erythematous (see below)
   Juvenile Dermatomyositis (see below)
   Vasculitic syndromes ( Kawasaki disease, Henoch Schoenlein Purpura, polyarteritis, microscopic polyangiitis, Takayasu’s disease, Wegener’s, Churg-Strauss, Bechet’s, etc
   Scleroderma syndromes (localized and generalized)
# B. CHILDHOOD ONSET ARTHRITIS – NEW AND OLD CLASSIFICATION

Diagnosis based on persistence of joint findings (swelling, loss of range, warmth) for at least 12 weeks and exclusion of another cause of joint complaints. Usually have morning stiffness.

<table>
<thead>
<tr>
<th>New classification</th>
<th>Juvenile Idiopathic Arthritis</th>
<th>Old classification</th>
<th>Juvenile Rheumatoid Arthritis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Systemic onset</strong></td>
<td>– quotidian fevers &gt; 38.5°C &gt; 2 wks; return to baseline between fever spikes</td>
<td>same</td>
<td>same</td>
</tr>
<tr>
<td></td>
<td>evanescent rash</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>serositis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>arthritis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(any age, any gender; labs nonspecific but usually high wbc's, platelets &amp; ESR, CRP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oligoarticular:</strong></td>
<td>&lt; 5 joints</td>
<td>Pauciarticular type 1</td>
<td></td>
</tr>
<tr>
<td>young onset</td>
<td>(&lt; 5 yrs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>females &gt;&gt; males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>large joints; never hips</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>highest risk of chronic (asymptomatic) iritis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>eye exams every 3 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANA good marker for this</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>other labs nonspecific</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Extended Oligoarticular:</strong></td>
<td>&lt; 5 joints in first six months</td>
<td>Pauciarticular type 2</td>
<td></td>
</tr>
<tr>
<td>but add more (spotty distribution)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spondyloarthropathies:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>older onset (&gt;7 yrs)</td>
<td>Polyarticular type 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>males &gt;&gt; females</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>axial distribution incl. hips</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>enthesitis (tendonitis)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>often HLA - B-27 +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>risk of acute iritis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Polyarticular Rheumatoid factor negative:</strong></td>
<td>Polyarticular type 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>five or more joints (usually many more)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>females &gt; males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>any age – mean age 6 yrs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF negative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lower risk of chronic iritis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Polyarticular Rheumatoid factor positive:</strong></td>
<td>Polyarticular type 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>five or more joints (usually many more)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>females&gt;males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usually teenagers; get nodules, vasculitis etc – bad disease!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Psoriasis related arthritis:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arthritis with skin changes of psoriasis or arthritis with nail pits and FH of psoriasis.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Treatment of Juvenile Arthritis:**

**Goals:** no active inflammation; normal range of movement and function; normal psychosocial development

- **First line drugs:** non steroidalas (NSAID’s) (naproxen, ibuprofen; etc)
- **Second line drugs:** sulfasalazine for spondyloarthropathies
- methotrexate for other forms
- **Third line drugs:** TNF inhibitors or other biologics
- **Steroids:** systemic indicated for severe disease, e.g. IV 30 mg/kg / day for severe pleuritis, pericarditis in systemic disease; may be needed for eye disease intra-articular steroids helpful for local control of inflamed joints.

**Physical and Occupational Therapy:** behavioral management.

*(Rheumatic Diseases – Dr. Emery – Rev. 5/05)*
SYSTEMIC LUPUS ERYTHEMATOSUS

When to think about SLE:

1. Multiple organ systems involved
2. Exclusion of other systemic illnesses such as infections, malignancy
3. Cutaneous findings consistent with SLE
4. Evidence of autoimmunity or immune complex mediated disease
5. Most common in adolescent females

Criteria (4/11 needed to classify)

Four Skin:
1. malar rash
2. oral ulcers (painless - hard palate)
3. photosensitive (rash, fever, feel bad)
4. discoid lupus (atrophic, scarring)

Two Lab:
5. positive ANA (generally high titer, ≥ 1:640)
   (Remember ANA is positive in a lot of conditions besides SLE, but > 95% of SLE patients have +ANA, so - ANA is unusual and should make you reconsider the diagnosis)
6. a. anti-dsDNA
   b. anti-Sm (Smith) - only 30% have it
   c. chronic false positive VDRL
   d. antiphospholipid antibodies

Five Major organs:
7. arthritis - non-deforming - very painful, can be red
8. CNS
   a. seizures
   b. psychosis
9. renal
   a. nephrotic
   b. nephritic
10. polyserositis
    a. pericarditis
    b. pleuritis
11. hematologic
    a. thrombocytopenia
    b. leukopenia
    c. lymphopenia
    d. hemolytic anemia, usually Coombs positive

These are the criteria; however, the organ systems identified may have other involvement that aren’t included in the criteria, e.g., CNS disease may declare with strokes, and other organ systems can be involved but are not listed in the criteria, e.g., autoimmune thyroid disease

Quick physical examination clues:

General: may be hypertensive, febrile, look sick
Head and Neck: hair comes out easily, row of short hairs near forehead (lupus hairs), malar rash, painless rash on hard palate, nasal septal inflammation, inflamed gingiva, cotton-wool spots on retina, splinter hemorrhages
Chest: dyspnea, orthopnea, pleuritic signs
Abdomen: hepatosplenomegaly
Peripheral changes: microinfarctions on hands & feet, urticaria or odd vasculitic looking rashes, very painful arthritis in multiple joints.
Quick laboratory clues:

CBC – often leukopenic (beware the child with high white count when you suspect SLE – has an infection as well or you have the wrong diagnosis); thrombocytopenia common. Coombs may be positive without much anemia, PT normal with prolonged PTT that does not correct with a 1:1 mix (lupus anticoagulant). Counts may change rapidly.

ESR typically high with normal CRP (if CRP high, think infection)

UA – 80% of children with SLE have renal disease - look for protein, casts

Screen Cr, BUN, albumen

ANA positive in nearly all cases of SLE but takes time for lab turn around. ANA is also positive in lots of other conditions so it is not specific.

Treatment: Depends on severity of disease and organ affected

Principles: Control active disease and treat results of organ inflammation, e.g. hypertension from nephritis. Monitor labs, e.g., C3, C4, dsDNA antibodies as a guide to control, as well as tests of major organ system function.

Remember the impact of a life threatening and sometimes disfiguring disease (skin manifestations, steroid side-effects) on teenagers. Noncompliance is a real concern and may be life threatening.

Sunscreen

non-steroidal drugs (care with NSAID’s - ibuprofen associated with aseptic meningitis)

aspirin for antiphospholipid antibodies/ anticoagulation for thrombotic events

hydroxychloroquine (plaquenil)

steroids - topical, oral and IV pulses depending on severity

mycophenolate mofetil to maintain remission

cytotoxics - especially pulse IV cytoxan

plasmapheresis – if all else fails, especially for CNS disease

Diet – Calcium supplementation; sodium, calorie restriction.

Medicalert bracelet

Avoid estrogen containing bcp’s prefer progesterone or barrier methods); but also avoid unplanned pregnancy.

Outcome: Generally controllable but side effects common. Death usually due to infection, cardiac or CNS disease. Renal disease usually responsive to cytoxan, preventing need for dialysis. At risk for Addisonian crisis

**Juvenile Dermatomyositis**

Quick clinical clues: When to think about JDMS:

Rash: eyelids (sometimes on the face as well), knuckles, extensor surface of elbows, knees, “shawl” area of neck.

Weakness: proximal more than distal; can be subtle or severe.

Other features: vasculitis – targets the gut – abdominal pain, bleeding

nailbed changes (dilated capillary loops seen with opthalmoscope)

voice changes; difficulty swallowing; **aspiration**

respiratory insufficiency (because of weakness, may not show signs)

pulmonary hemorrhage rare

Quick laboratory clues:

Elevated CPK, aldolase, transaminases (not all increased LFT’s come from liver disease)

ESR usually high. Get chest film, PFT’s, and guiac stools

*(Rheumatic Diseases – Dr. Emery – Rev. 5/05)*
Treatment: Depends on severity of disease

Principles: Control active disease and don’t let your patient die from complications such as aspiration, GI vasculitis, resp failure. Uncontrolled disease puts patients at risk for permanent disability because of muscle destruction; also calcinosis. Monitor labs, e.g CPK, aldolase and clinical condition to follow disease activity

Steroids - IV pulses for severe disease; may use p.o. for mild diseases but absorption may be unreliable. Methotrexate weekly parenteral doses hydroxychloroquine (plaquenil) for skin/vasculitis other cytotoxics or biologics in severe or unresponsive disease – e.g., IV cytoxan, cyclosporine; mycophenolate mofetil, TNF inhibitors, IVIG Sunscreen mandatory Diet – Calcium supplementation; sodium, calorie restriction. Medicalert bracelet Physical and occupational therapy early to prevent contractures, regain strength.

Outcome: with early and adequate treatment most patients (>80%) are over their disease and off meds by 2-5 years with no residual damage or recurrence. Before aggressive treatment, 50% died and the remainder were very disabled.

Vasculitic syndromes

Quick clinical clues: when to think about vasculitis

Multisystem disease without evidence of infection, malignancy etc. Often febrile, sick.

Skin: vasculitis – nonblanching, purpuric lesions, often lower extremities
Renal: hypertension, renal compromise, UA abnormalities
Neuro: strokes, seizures, cranial or peripheral neuropathies
Joints: arthritis
GI: belly pain, bleeding, pancreatitis
Pulmonary: hemorrhage

You get the idea – anything with blood vessels in it can be affected!

Patterns: according to size of blood vessel affected

Henoch Schoenlein – small vessels, IgA mediated: skin, kidneys, joints gut most common ( testicular torsion can happen)
Kawasaki disease – discussed elsewhere Microscopic Polyangitis - small vessels in kidney, skin, gut, lungs – P- ANCA helpful Classic polyarteritis nodosa – Skin, GI, Renal, brain : imaging and biopsy helpful Wegener’s : sinus, lungs, kidneys – C - ANCA helpful Takayasu’s: large vessels – ischemic events. Feel pulses, listen for bruits.Imaging Angio or MRA) helpful.

Treatment: depends on type of vasculitis and organ affected. Steroids for threatened intussuception in HSP Steroids +/- cytotoxics for other diseases.
(This page intentionally left blank.)
SPONDYLOARTHROPATHIES IN CHILDHOOD

Diseases
- Ankyllosing spondylitis (AS)
- Psoriatic arthritis (PsA)
- Arthritis with Inflammatory Bowel Disease (IBD)
- Reactive arthritis
- Reiter's syndrome

Features
- positive family history
- frequently HLA B-27 positive
- later childhood onset
- male > female
- frequent sacroiliitis (adults)
- frequent enthesitis
- mostly lower extremity disease
- IgM rheumatoid factor negative
- may have high ESR's

Clinical characteristics:
- **Enthesitis**: Inflammation where tendons/ligaments attach to bone (bolded sites are more likely to be abnormal)
  - Metatarsal heads
  - **Patella**: 2, 6, 10 'o'clock
  - Plantar fascial insertion
  - Tibial tuberosity
  - **Sacroiliac joints**
  - Iliac crest
  - Greater trochanter
- **Achilles**
- **Arthritis** is generally in axial distribution

AS:
- SJ radiographic signs late, therefore very hard to diagnose (bone scan, MRI better)
- Check modified Schober's -- should be greater than 21 cm from baseline of 15 cm
- Check chest expansion--should be greater than 5 cm
- AM and PM (post exercise) pain and stiffness
- Can get acute iritis, aortic valve insufficiency

PsA:
- 1. spondylitis
- 2. asymmetric pauciarticular arthritis
- 3. symmetric polyarticular
- 4. DIP joint disease frequent (nail pits correlate with this)
- 5. arthritis mutilans
- 6. family history of psoriasis even if patient does not have skin findings

IBD:
- 1. non-deforming non-erosive polyarticular arthritis
- 2. spondylitis
- Joint findings may precede diarrhea/hematochezia or correlate with IBD flares; may also have pyoderma gangrenosum, erythema nodosum, oral ulceration, clubbing, acute iritis

Reactive:
- follows infection by 7 to 30 days, usually 10-14 days
- in kids usually GI (Shigella, Salmonella, Yersinia, Campylobactor) or post viral.
- in adults frequently venereal (Chlamydia, Ureaplasma)

Reiter's:
- arthritis, urethritis, conjunctivitis--may be asynchronous
- keratoderma blennorrhagicum
- balanitis or labial ulceration
- painless oral ulcers
- one-third later go on to get AS

W/U:
- UA, CBC, ESR, CRP, ANA, RF, radiographs, ± HLA B27

Rx:
- ice / heat - whichever is better tolerated; shoe inserts.
- Physical Therapy for stretching, strengthening, back program, and back mechanics
- NSAIDs, especially indomethacin, sulindac, and diclofenac
- Sulfasalazine
- Methotrexate
- TNF inhibitors
- Rarely, low dose prednisone
- Intraarticular injections may be of great help

Reference:
Selected Rheumatologic Laboratory Tests

ANA antinuclear antibody test

Anti-centromere antibodies
(see it when do an ANA)

DNA binding anti-dsDNA antibodies

ENA Extractable Nuclear Antibodies

SSA or Ro [two forms, 52 kDa & 60 kDa]

Anti-Histone antibodies

Rheumatoid Factor (RF)
Classic RF is IgM anti-IgG
[Hidden RF is IgG anti-IgG]
[IgA RF is IgA anti-IgG]

CH50 Complement Hemolysis 50%

Complement Pathways:
Alternate: Protein B ▶ Factor D ▶ Factor P
Classic: C1q+C1r+C1s ▶ C4 ▶ C2 ▶ C3 ▶ C5 ▶ C6 ▶ C7 ▶ C8 ▶ C9

Lupus Anticoagulant:
prolonged Partial Thromboplastin Time that does not correct with a 1:1 mix of normal plasm
chronic false positive VRDL
positive antidiolipin antibodies
IgM not as frequent
IgG more likely to be a problem
IgA not as frequent
Anti β2 glycoprotein 1 tends to be frequently a problem
prolonged platelet activated thromboplasin time
prolonged Russell viper venom test

Anti-Scl 70,

ANCA antineutrophil cytoplasmic antibody

cytoplasmic
perinuclear

LOW TITER [1:40-1:320] = juvenile rheumatoid arthritis
(especially pauciarticular onset with a high risk for asymptomatic uveitis)

HIGH TITER [1:640 +] = SLE/ Mixed Connective Tissue Disease

= CREST (Calcinosis, Raynaud's, Esophageal dysfunction,
Sclerodactyly, Telangiectasia)

= SLE (systemic lupus erythematosus) (>90% active SLE)

= MCTD (Mixed Connective Tissue Disease) (95%)

= SLE (only 30% have it, very specific though)

= Sjogren's (60%), 15% SLE

= Neonatal Lupus (especially Congenital Complete Heart Block)
Subacute Cutaneous Lupus
Sjogren's (70%)

= Drug induced lupus

= adult rheumatoid arthritis, higher risk for erosions
also is non-specifically positive in immune complex disease
classic for subacute bacterial endocarditis

= tests the entire complement system, C8 punches holes in
sheep erythrocytes and C9 enlarges the hole
This should be done if suspect a complement deficiency
Early deficiencies look like weird SLE
Late deficiencies are associated with infections
(e specially Neisseria)

NOTE: they named them out of order* so Streptococcus, that
activates the alternative pathway, leads to a low C3 level, not C4

thrombosis (stroke, pulmonary embolism, deep vein thrombosis)
Pulmonary hypertension. In about 5 – 10% of SLE patient

Systemic scleroderma (10-20%)

cANCA (cytoplasmic) in Wegener's.
anti PR3

pANCA (perinuclear) in microscopic angiitis. anti MPO

© David D. Sherry, MD, 1999