

RHEUMATOLOGIC TESTS

LEARNING OBJECTIVES:

Medical Knowledge: Students should be able to define, describe, & discuss:

1. The way to approach a patient with a potential rheumatic disease & order appropriate diagnostic tests based on pre-test probability of disease
2. The various auto-antibodies and what their presence signifies in disease pathogenesis
3. The utility of synovial fluid recovery and the interpretation of the fluid.
4. The basic role of genetics in autoimmune disorders

Patient Care: Students should be able to demonstrate specific skills, including:

1. How the patient's history & physical lead one to choose subsequent diagnostic tests rather than performing a "shot-gun" approach to rheumatic disease
2. Understanding how the tests results help to rule in, rule out, or qualify the severity or classification of rheumatic disease
3. Appropriate ordering of radiologic tests

Professionalism:

1. Be sensitive to risk-benefit, cost-benefit & evidence-based considerations in the selection of diagnostic and therapeutic interventions for rheumatologic problems
2. Recognize the importance of patient preferences when selecting among diagnostic and therapeutic options for rheumatologic problems.
3. Demonstrate ongoing commitment to self-directed learning regarding rheumatologic problems.
4. Appreciate the impact rheumatologic problems have on a patient's quality of life, well-being, ability to work, & the family.

MATCH THE SCENARIO WITH THE SYNOVIAL FLUID

Case I:

50 y/o obese man with pain on standing, ambulation. Exam reveals minimal warmth & slight effusion of the left knee with crepitus, but good pROM

Color	Yellow
WBC/mm3	2000-50,000
% Neutrophils	>50%

Case II:

50 y/o obese diabetic man with a history of gout & sudden onset of severe swelling of his left knee, exquisite pain with any motion, & erythema over the joint. He has a low-grade fever. Exam reveals a red, hot, swollen joint; no active or passive range of motion allowed by patient. Bland tophi are noted over the elbows & ears. His WBC count is 20.

Color	Yellow
WBC/mm3	200-2000
% Neutrophils	<25%

Case III:

50 y/o obese diabetic man with a history of gout & sudden onset of severe swelling of his left knee, right wrist & left ankle. He complains of exquisite pain with any motion, & erythema over the joint. He has a low-grade fever. Exam reveals 3 red, hot, swollen joints; no active or passive range of motion allowed by patient. Bland tophi are noted over the elbows & ears. His WBC count is 20.

Color	Opaque
WBC/mm3	>80,000
% Neutrophils	95%

Case IV:

40 y/o woman with a h/o RA who recently stopped all her medications.

She complains of a flare in her b/l wrists & left knee. Exam reveals b/l wrist swelling & moderate synovitis and effusion of the left knee with warmth, but no erythema.

Color	Yellow/Turbid
WBC/mm3	>80,000
% Neutrophils	85%

Case V:

The same guy from case I, but it is your first time tapping a knee & the fluid come out dark red

Color	bloody
WBC/mm3	5000
% Neutrophils	80%

CASE VI: (5 min)

Medical History: A 46 y/o woman with a history of hypothyroidism, acne & chronic hepatitis C (but no cirrhosis) presents with a 5 year history of diffuse arthralgia that are poorly localized & 10/10 in severity. The pain is constant, dull/aching in nature with no exacerbating or alleviating factors. She also reports some b/l knee pain that is worse with standing, walking & improved with rest. She reports associated poor, non-restorative sleep & depression. She denies associated morning stiffness, swelling, rashes, ulcers, fevers, weight loss. ROS (review of systems) is otherwise negative. Her past history is otherwise significant for a history of 3 normal pregnancies & a mother with SLE (systemic lupus erythematosus). She takes synthroid for her hypothyroidism & minocycline for her acne.

Physical Exam: WDWN (well-developed, well-nourished) woman with a BMI of 35. VSS (vital signs stable).

Positive Findings: Multiple tender points over her upper & lower back, anterior chest, arms & legs. Flattened affect. Bilateral knees have palpable crepitus with passive ROM

Negative Findings: No hair loss, skin rash, oral ulcers, joint swelling or deformity, or neurologic deficit.

Laboratory Data:

ANA (anti-nuclear antibody): 1:40

RF (rheumatoid factor): 50 (normal is < 20)

CCP (cyclic citrullinated peptide antibody): pending

ESR (erythrocyte sedimentation rate): 3 (normal <10)

CRP (C-Reactive Protein): <0.1

DISCUSSION

1. Formulate 3 differential diagnoses listed in order from more likely to less likely. Support your list with medical knowledge & exam skills of rheumatic disease learned in the previous lecture.
2. What are some reasons for this woman's positive ANA?
3. What are some reasons for this woman's positive RF?
4. Predict the result of this woman's CCP antibody

Notes:

CASE VII: (5 min)

Medical History: A 30 y/o woman without prior medical history presents with 6 weeks of pain & swelling in her bilateral elbows, wrists, & ankles. The pain is 6/10, dull/achy, intermittent & worse in the morning when she wakes up. She notices improvement as the day progresses. She also takes about 800 mg of ibuprofen at least 4 times daily with moderate relief. She reports associated stiffness in the AM for at least 1 hour that improves with use, & some warmth over her painful joints. Aside from the joint symptoms, she notes severe fatigue that limits her daily activities, ulcers in her mouth, some hair thinning, and a rash over her cheeks in the shape of a butterfly that seems to worsen in the sun and lasts for about 1 week at a time. Her past history is otherwise significant for a history of 3-second trimester spontaneous abortions & a mother with SLE (systemic lupus erythematosus)

Physical Exam: WDWN (well-developed, well-nourished) woman with a BMI of 20. Her vital signs are remarkable for a BP of 160/90

Positive Findings: Temporal hair thinning, palpable malar rash, prominent cervical & axillary lymph nodes, ulcers on the upper hard palate, swelling/tenderness/warmth (aka “synovitis”) of her joints, & 1+ edema of her lower legs.

Negative Findings: No tachycardia, murmurs or rubs, abnormal breath sounds, eye abnormalities, or neurologic abnormalities

Laboratory Data:

ANA: 1:1280

RF: 10 (normal is < 20)

CCP: negative

ESR: 88 (normal <10)

CRP: 10 (normal < 0.8)

C3: 60 (normal > 85)

C4: 2 (normal > 20)

CBC w/ diff: WBC 2.5, Hgb 8, PLT 80

Nuclear antibodies (also known as ENA-extractable nuclear antigen panel at Loyola): All are normally < 1.0

RNP: >8.0

Sm (Smith)/RNP: >8.0

Smith (alone): 3.5

SSA: 3

SSB: <1.0

SCL-70: <1.0

ds (double stranded, or “native”) DNA: >300 (normal <10)

DISCUSSION

1. Formulate 3 differential diagnoses listed in order from more likely to less likely. Support your list with medical knowledge & exam skills of rheumatic disease learned in the previous lecture.
2. Her ESR is almost 100. What is the most likely explanation?
3. How might her past history of recurrent miscarriages relate to her diagnosis? What additional labs should you order?
4. What “lupus activity monitoring” tests would you check at follow up?

Notes:

CASE VIII: (5 min)

Medical History: A 41 y/o man without prior medical history presents with 6 months of insidious skin changes. He first noticed his fingers turning white, then blue in the cold weather with intense redness upon rewarming about 6 months ago. Thereafter, he started getting intense pruritus over his fingers & slightly over his face with erythema, followed by tightening of the skin. He also noticed tiny ulcers at his fingertips. ROS is positive for very mild increased dyspnea on exertion. His past medical history is otherwise unremarkable, and he is on no meds.

Physical Exam: WDWN (well-developed, well-nourished) man with a BMI of 24. VSS

Positive Findings: Decreased oral aperture; Erythema & thickening over all of the fingers & slightly over the hands with mild contractures of the fingers. Several pits at the finger pads just

below the nails with thin brittle nails. Extremities are cool with slightly decreased capillary refill and some visible capillary dilation at the cuticles.

Negative Findings: No tachycardia, murmurs or rubs, abnormal breath sounds, eye abnormalities, or neurologic abnormalities

Laboratory Data:

ANA: 1:1280

ESR: 30 (normal <10)

CRP: 0.5 (normal < 0.8)

Nuclear antibodies:

RNP: < 1.0

Sm/RNP: < 1.0

Sm: < 1.0

SSA: < 1.0

SSB: <1.0

SCL-70: pending

dsDNA: <10

DISCUSSION

1. Formulate 3 differential diagnoses listed in order from more likely to less likely. Support your list with medical knowledge & exam skills of rheumatic disease learned in the previous lecture.

2. You visit the immunology laboratory to discuss the ANA & learn that the ANA immunofluorescence pattern is centromere. What screening tests, if any, do you want to do?

3. This same patient is later admitted to the hospital with headaches & found to have a blood pressure of 180/100. She has new renal dysfunction with a creatinine of 2.0. What is happening, & what should you do? Bonus: what iatrogenic cause could have precipitated this?

Notes: