MIMICS OF SYSTEMIC LUPUS ERYTHEMATOSUS

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What is defined as SLE?

Classification criteria?

1001 ways to have Lupus!
- 4/14 (1971 Criteria)
- \( r/n = n! / r!(n-r)! \)

330 ways to have Lupus!
- 4/11 (1982 Revision)
But-----

- Majority of the presentations are non-specific
- Remains one of the top 10 conditions where diagnosis is often delayed or missed
- Be cautious: there is a real risk of over diagnosis
Some patients and presentations
Painful Scenario

- 28 year old female
- 1st admission: January 2012, General Surgery

- No past medical history apart from a LSCS 2 years prior

- Now presented with:
  - Abdominal pain x 2/7
  - Nausea and vomiting x 2/7
  - Diarrhea x 2/7
Dilatation / thickening of the upper small bowel suggestive of enteritis with differential of hypoproteinemic states
Mild right hydronephrosis with ectatic right ureter
Thickening of the bladder wall may be due to cystitis.
Progress

- Repeated presentations for abdominal symptoms
- Treated as infectious enteritis, hyperemesis gravidarum, adhesion colic, UTI
- Developed patchy alopecia in 2nd trimester, told “pregnancy related”

- LSCS for breech
- Post op day: intractable vomiting, abdominal distention, diarrhea
Distended small bowels with suggestion of transition at the lower abdomen associated with moderate amount of free fluid with peritoneal enhancement with suggestion of perforation peritonitis
Further history:
- Recurrent admissions for abdominal pain in last year
- No Raynaud’s, sicca, joint pains, ulcers, rash, photosensitivity
- Rapid hair loss during pregnancy
- No family history
- Uncomplicated pregnancies

Investigations:
- WBC 13.2 x10⁹/L (3.4-9.6)
  - Lymphopenia
- Albumin 20 g/L
- UPCR 0.6G/day
- ANA 1:640
Impression: SLE

- Lupus gut
- Borderline proteinuria (no urinary sediments)
- Alopecia
- Serology: highly positive ANA, anti dsDNA +
- Low complements
Learning Points

- Not all SLE patients present with usual symptoms of sicca / joint pain / rash / Raynaud’s

- Classification criteria for SLE have limited sensitivity

- “Incomplete SLE”
  - 57% patients with SLE will develop SLE in a median of 5.3 years.
  - These are prone to major organ damage.
  - Early identification and treatment improve prognosis.

Doria A, Briani C. Lupus. 2008 Mar;17(3):166-70
Serological autoimmunity
ANA positivity

Early clinical autoimmunity
ILE

Established autoimmunity
SLE

IgM autoantibodies
- Promote clearance of antigenic cell debris
- Other immunoregulatory effects

Androgens

Antibody class switching

IgG autoantibodies
- Promote immune activation via Fc receptors and complement
- Mediate tissue damage
- Spreading of antibody specificities

Oestrogens

NUHS
National University Health System
A man with painful joints

- 32 year old male

- Presents with:
  - Joint pain for 2 months
    - Inflammatory
    - Small and large joints
  - Further History?
    - Loss of weight: 5 kg in 6 months
    - Dry mouth for few months
    - Rashes
Examination

- Physical examination
  - Afebrile, normal hemodynamics
  - Mild tenderness at MCPJs, PIPJs, wrists, knees and ankles
  - Reduced tear and saliva film
  - Diffuse erythematous rashes
Investigations

- **Initial results:**
  - WBC: $3.2 \times 10^9$/L (3.4-9.6)
  - Hb: 10.5 g/dL (10.9-15.2)
  - ESR: 88 mm/hr (3-9)
  - Albumin: 32g/L (38-48)
  - Creatinine: 72 mmol/L (50-90)

- **What else would you like to know?**
  - ANA: positive, 1: 320, speckled and homogenous
  - Rheumatoid Factor: positive, 82 IU/ml (<25)
Sufficient information for diagnosis?

Scenario:
- Young man with inflammatory polyarthritis, rashes, sicca symptoms, and weight loss
- Bicytopenia, raised inflammatory markers and positive serologies

What is the diagnosis?
- SLE
- Rheumatoid Arthritis
- Sjogren syndrome
- Overlap syndrome

Other possibilities?
Back to Basics

- Further history:
  - Unemployed, lives alone
  - Denies current IVDU but has used it in past
  - Denies any significant family hx

- Re-examination:
  - Rashes
Further Investigations

- Anti-CCP: negative
- Anti dsDNA: negative
- Anti-Ro/La: negative
- Complements: normal
- Blood Film: fragmented RBCs
- Haptoglobins: low
- AST/ALT: raised

What other investigations would you like to do?
Finally-------

- More investigations:
  - Anti HCV: positive
  - Viral load: high
  - Cryoglobulins: positive

- Final Diagnosis:
  **Hepatitis C with immune mediated extra-hepatic manifestations**
Extra hepatic Manifestations of Hepatitis C infection

- Wide range
- Complex incompletely understood pathogenesis
  - HCV lymphtopism
  - Chronic B cell activation
  - Antibody production
  - Progression to LPD


## Prevalence of antibodies in HCV

<table>
<thead>
<tr>
<th>Autoantibodies</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF</td>
<td>36</td>
<td>44</td>
</tr>
<tr>
<td>ANA</td>
<td>31</td>
<td>38</td>
</tr>
<tr>
<td>Anti-ds-DNA</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Anti-cardiolipin IgM</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>Anti-cardiolipin IgG</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Anti-ss-A/Ro</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Anti-ss-B/La</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Anti-Sm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Anti-RNP</td>
<td>0</td>
<td>0</td>
</tr>
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</table>
Variable strength of associations

<table>
<thead>
<tr>
<th>HCV-related rheumatic diseases in the setting of HCV syndrome</th>
<th>strength of association between HCV and diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HCV Syndrome</strong></td>
<td><strong>Rheumatic diseases</strong></td>
</tr>
<tr>
<td></td>
<td>Mixed cryoglobulinemia</td>
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<tr>
<td></td>
<td>Sicca syndrome</td>
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<tr>
<td></td>
<td>Arthritis</td>
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<td></td>
<td>Osteosclerosis</td>
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<td></td>
<td>Sjögren's syndrome</td>
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<tr>
<td></td>
<td>Poly/Dermatomyositis</td>
</tr>
<tr>
<td></td>
<td>Polyarteritis nodosa</td>
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<tr>
<td></td>
<td><strong>Others</strong></td>
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<tr>
<td></td>
<td>Hepatitis</td>
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<tr>
<td></td>
<td>HCC</td>
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<td></td>
<td>B-cell NHL</td>
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<tr>
<td></td>
<td>Monoclonal-gammopathies</td>
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<tr>
<td></td>
<td>Porphyria cutanea tarda</td>
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<td></td>
<td>Glomerulonephritis</td>
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<td></td>
<td>Autoimmune thyroiditis</td>
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<td></td>
<td>Type 2 diabetes mellitus</td>
</tr>
<tr>
<td></td>
<td>Thyroid cancer</td>
</tr>
</tbody>
</table>

Treatment is vastly different!

- **Mild to Moderate disease** (Purpura, arthralgia, polyneuropathy): Peg IFN-α + Ribavirin
- **Severe disease** (Progressive renal disease, mononeuritis multiplex, skin ulcer): Rituximab, Peg IFN-α + Ribavirin
- **Life threatening** (Rapidly progressive nephritis, CNS, digestive and/or pulmonary involvement): Steroids, plasma exchange, cyclophosphamide and/or rituximab, Peg IFN-α + Ribavirin (differed)
Rheumatic Diseases in HIV

- HIV associated with multiple rheumatic syndromes
- Pathogenesis
  - Prolonged immune stimulation
  - Loss of regulatory T cells - CD4
  - CD8 mediated immune diseases
  - Increased levels of cytokines
- Changing spectrum after HARRT
Diseases unique to patients with HIV infection
Diffuse infiltrative leukocytosis syndrome
HIV-associated arthritis
Zidovudine-associated myopathy
Painful articular syndrome

Diseases encountered in HIV-infected patients
HIV-associated Reiter syndrome
Polymyositis
Psoriatic arthritis
Polyarteritis nodosa
Giant-cell arteritis
Hypersensitivity angiitis
Wegener granulomatosis
Henoch–Schönlein purpura
Behçet disease
Infectious arthritis (bacterial, fungal)
Scleroderma

Diseases that are ameliorated by HIV infection but worsen or reappear with immune reconstitution inflammatory syndrome
Rheumatoid arthritis
Systemic lupus erythematosus
Sarcoidosis
Other Infectious Diseases

- **Viral:**
  - Hepatitis B
  - Parvovirus B19
  - Infectious mononucleosis (Epstein-Barr Virus)

- **Bacterial:**
  - Lyme’s disease
  - Tuberculosis
  - Syphilis (secondary)
  - Infective Endocarditis
Take Home message

- Chronic Infections can mimic AI diseases
- Serologies can be misleading
- Look at the clinical picture
- Employ tests when indicated, but remember to treat the patient, not the test
- Consider infection associated rheumatic/autoimmune syndromes when the presentation is not typical
Rashes and Lumps

- 35 year old female
- Presents with 2 month history of:
  - Intermittent fever
  - Weight loss
  - Rashes
  - Hand pain
  - Lumps in the neck
Investigations

- Seen by her GP and labs done
  - WBC: 3.2 x10^9/L (3.4-9.6)
  - Hb: 9.5 g/dL (10.9-15.2)
  - ESR: 110 mm/hr (3-9)
  - Albumin: 28g/L (38-48)
  - ANA: positive
  - Anti dsDNA: 28 (<25)
  - Complements: low

- Prescribed steroids but has not started yet
What will you suggest?
Some more......
Etiology?

- Induced Sputum: negative for TB

Next Step?
- Lymph node biopsy

Diagnosis?
- Small Lymphocytic Lymphoma
Lymphadenopathy is common in SLE
Reported in 25-67% of patients
However, watch out if:
- Generalized lymphadenopathy
- Concomitant hepato-splenomegaly
- B symptoms
Autoantibodies:
- Be aware of low specificity
### Antibody Specificity

#### Table 1: Positive Predictive Value of +Antinuclear Antibody Screen, by Titer

<table>
<thead>
<tr>
<th>ANA Titer</th>
<th>No. of Patients (Total = 232; Total With Available Titer at Time of Evaluation = 227)*</th>
<th>No. of Patients with ANA-Associated Rheumatic Diseases (and No. With SLE)</th>
<th>PPV (for any AARD) of +ANA Test Using This Titer as Cutoff Value</th>
<th>PPV of +ANA Test for SLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\geq 1:40$</td>
<td>227</td>
<td>20 (5)</td>
<td>8.8%</td>
<td>2.2%</td>
</tr>
<tr>
<td>$\geq 1:80$</td>
<td>200</td>
<td>20 (5)</td>
<td>10%</td>
<td>2.5%</td>
</tr>
<tr>
<td>$\geq 1:160$</td>
<td>172</td>
<td>20 (5)</td>
<td>11.6%</td>
<td>2.9%</td>
</tr>
<tr>
<td>$\geq 1:320$</td>
<td>101</td>
<td>19 (4)</td>
<td>18.9%</td>
<td>4%</td>
</tr>
<tr>
<td>$\geq 1:640$</td>
<td>67</td>
<td>18 (4)</td>
<td>26.9%</td>
<td>6%</td>
</tr>
<tr>
<td>$\geq 1:1280$</td>
<td>36</td>
<td>14 (2)</td>
<td>38.9%</td>
<td>5.6%</td>
</tr>
<tr>
<td>$\geq 1:2560$</td>
<td>13</td>
<td>6 (0)</td>
<td>46.2%</td>
<td>N/A</td>
</tr>
<tr>
<td>$\geq 1:5120$</td>
<td>7</td>
<td>4 (0)</td>
<td>57.1%</td>
<td>N/A</td>
</tr>
<tr>
<td>No titer</td>
<td>5</td>
<td>1 (0)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
The Patient with hot knots

- 30 year old female
- Fever x 10 days
- Red spots over the shin x 1/12
- Referred to “HOT” clinic
- Investigations:
  - ESR 32
  - ANA 1: 640
Further History

- 6 months history of:
  - Fatigue
  - Myalgias
  - Painful oral ulcers
  - 8 kg weight loss

- Diagnosis: SLE
Next admission

- Admitted for high grade fever
- Noted to have pancytopenia
- Diagnosis:
  - Neutropenic fever sec to SLE related pancytopenia
- Worsening clinical condition
  - Features of macrophage activation syndrome
- Supportive therapy with cryoprecipitate, antibiotics and fluids
Further Investigations

- Skin biopsy
  - atypical lymphoid infiltrate with fat necrosis and panniculitic changes, consistent with subcutaneous panniculitis-like T cell lymphoma
Diagnostic Algorithm – Tissue is the Issue

- Imaging
  - Tissue Biopsy
    - +/- Tissue Culture
Refractory Rashes

- 44 year old female
- 2 years history of recurrent rashes
  - Erythematous, scaly, extensor surfaces
Progression

- Treated as psoriasis
  - Topical steroid creams
  - Phototherapy
  - Methotrexate
  - TNF inhibitors

- 3 months later:
  - Presented with
    - Inflammatory joint pain
    - New onset feet swelling
    - Pleuritic chest pain
Is it Psoriatic arthritis?

- Examination
  - Pitting pedal edema bilaterally
  - Inflamed MCP and MTPJs

- Investigations
  - RF, CCP negative
  - ESR 84 mm/hr (5-15)
  - Urine dipstick: protein 2+
  - Normal serum creatinine and liver enzymes
What else would you like to consider?
Clinical Picture

- Middle aged woman
- Long standing rashes
- New onset synovitis, proteinuria, ILD
- After use of TNF inhibitors
- Further Investigations: ANA positive

- Diagnosis: Drug Induced SLE
Drug Induced Lupus (DIL)

- First case report in 1945
- More than 90 drugs and recombinant therapeutic agents have been associated with DIL
- It is estimated that 10–15% of patients diagnosed with SLE are drug induced
- Factors influencing the development of DIL:
  - Gender, age, and genetic predisposition
  - Structure of the inciting drug
  - Rate of metabolism as determined by acetylator status
Drug-induced lupus

- The association between individual drugs and DIL can be divided in 3 categories:
  - Definite: confirmed association (of variable risk) based on controlled studies
  - Possible: based on consistent reports in large series and cohorts
  - Probable: Based on few case reports
<table>
<thead>
<tr>
<th>High risk</th>
<th>Definite</th>
<th>Possible</th>
<th>Suggested</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hydralazine</td>
<td>Sulfadiazine</td>
<td>Captopril</td>
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<tr>
<td></td>
<td>Procainamide</td>
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<tr>
<td>Moderate risk</td>
<td>Quinidine</td>
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<td></td>
<td>Isoniazid</td>
<td></td>
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<tr>
<td>Low risk</td>
<td>Methyldopa</td>
<td>Carbamazepine</td>
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<td></td>
<td>Chlorpromazine</td>
<td>Propylthiouracil</td>
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<td></td>
<td></td>
<td>Penicillamine</td>
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</tr>
<tr>
<td>Very low risk</td>
<td>Minoxycline</td>
<td>Ethosuximide</td>
<td>Gold salts</td>
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<tr>
<td></td>
<td></td>
<td>Phenytoin</td>
<td>Penicillin, Streptomycin, Tetracycline,</td>
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<td></td>
<td></td>
<td>Primidone</td>
<td>Ciprofloxacin, Rifampicin, Nitrofurantoin</td>
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<td></td>
<td></td>
<td>Trimethadione</td>
<td>Cefepime</td>
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<td></td>
<td></td>
<td>Valproate</td>
<td>Phenylbutazon</td>
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<tr>
<td></td>
<td></td>
<td>Diphenylhydantoin</td>
<td>Estrogens, Oral contraceptives Danazol.</td>
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<tr>
<td></td>
<td></td>
<td>Zonisamide</td>
<td>Lithium</td>
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<tr>
<td></td>
<td></td>
<td>Methimazol</td>
<td>Para-aminosalicylic acid</td>
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<td></td>
<td></td>
<td>Atenolol</td>
<td>Ibuprofen</td>
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<td></td>
<td></td>
<td>Timolol</td>
<td>Diclofenac, Benoxaprofen, Mesalazine</td>
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<td></td>
<td></td>
<td>Pindolol</td>
<td>Reserpine</td>
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<td></td>
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<td>Oxprenolol</td>
<td>Griseofulvin</td>
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<td>Propranolol</td>
<td>Clonidine</td>
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<td></td>
<td>Labetalol</td>
<td>Hydroxiurea</td>
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<tr>
<td></td>
<td></td>
<td>Acebutolol</td>
<td>Interferons (others than IFN alpha)</td>
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<td></td>
<td>Metoprolol</td>
<td>Gemfibroamil</td>
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<td></td>
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<td>Hydrochlorothiazide</td>
<td>Allopurinol</td>
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<td></td>
<td>Terbinafine</td>
<td>Quinine</td>
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<td></td>
<td>Lovastatin</td>
<td>Minoxidil</td>
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<td></td>
<td>Simvastatin</td>
<td>Calcium channel blockers</td>
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<td></td>
<td></td>
<td>Fluvastatin</td>
<td>Enalapril, Lisinopril</td>
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<td>Pravastatin</td>
<td>Amiodarone, Spironolactone</td>
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<td></td>
<td>Atorvastatin</td>
<td>Psoralen</td>
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<td>Fluorouracil</td>
<td>Interleukin-2</td>
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<td>Interferon α</td>
<td>Clofazam, Clozapine</td>
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<td>Tocainide</td>
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<td>Etanercept, Infliximab</td>
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<td>Adalimumab, Certolizumab pegol</td>
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<td>Zafirlukast</td>
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<td>Ticlopidine</td>
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<td></td>
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<td></td>
<td>Bupropion</td>
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<td></td>
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<td>Omeprazol, Esomerazol</td>
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</tbody>
</table>
Clinical Picture

- Usually milder disease
  - Arthralgias, myalgias, fevers, and serositis are more common in DIL
  - Rashes (malar rash, discoid rash), photosensitivity, and oral ulcers occur less frequently in DIL
  - Renal and central nervous system disease rarely
  - Exceptions have been reported
  - Antibodies: mostly ANA and anti histones
## Antibody associations: SLE vs DIL

<table>
<thead>
<tr>
<th>Antigen</th>
<th>SLE</th>
<th>Drug-Induced LE</th>
</tr>
</thead>
<tbody>
<tr>
<td>dsDNA</td>
<td>40%</td>
<td>No</td>
</tr>
<tr>
<td>ssDNA</td>
<td>70%</td>
<td>75%-80%</td>
</tr>
<tr>
<td>Histone</td>
<td>70%</td>
<td>&gt;95%</td>
</tr>
<tr>
<td>Sm antigen</td>
<td>30%</td>
<td>No</td>
</tr>
<tr>
<td>Nuclear RNP</td>
<td>30%</td>
<td>No</td>
</tr>
<tr>
<td>Ribosomal RNP</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>SS-A/Ro</td>
<td>35%</td>
<td>No</td>
</tr>
<tr>
<td>SS-B/La</td>
<td>15%</td>
<td>No</td>
</tr>
</tbody>
</table>
Guidelines for the diagnosis of DILE

1. Exposure to a drug suspected to induce DILE of at least 1 month, usually longer.
2. Symptoms or organ involvement such as arthralgia, myalgia, fever, serositis and dermatological rash.
3. Laboratory findings ANA, anti-histone positive in the absence of other antibody specificities (i.e. anti-Sm, anti-dsDNA, ENA).
4. No previous evidence of SLE.
5. Improvement of symptoms within days or weeks of drug discontinuation.
A Gut Feeling

- 51 Chinese Female
- Systemic lupus erythematosus x 5 years
  - Recent flare (autoimmune hepatitis, pneumonitis, cytopenias)
  - Treated with high dose prednisolone (0.6mg/kg/day)
- Latest prescription
  - Mycophenolate mofetil 2.5g daily
  - Hydroxychloroquine 200mg and Prednisolone 10mg
A Gut Feeling

- Presents with
  - Fever x 2/52
    - Daily fever, no night sweats
  - LOW and LOA x 1/12
    - 2-3kg over past 1/12 with epigastric discomfort, no change in bowel pattern
  - Intermittent Cough
- Physical examination
  - Temp: 38°C
  - Small supraclavicular lymph nodes
  - Tender right IF region
Investigations

- TW 7.05 x10⁹/L
- Hb 11.3g/dL
- Plt 221 x10⁹/L
- ESR 102mm/hr
- CRP 63mg/L
- C3 75mg/dL (85-185)
- C4 12mg/dL (10-50)
- Anti-dsDNA 39 IU
- Albumin 33 (38-48)
- AST 23 (10-50)
- ALT 35 (10-70)
CT Abdomen

Cecal wall thickening 4.00 mm
What would you do next?
### Other Investigations

#### AFB smear
- **Sample Origin**: Sputum, Induced
- **Request status**: Completed
- **Visual Aspect**: 
- **Acid fast bacilli**: not seen on direct smear

#### TB molecular
- **Sample Origin**: Sputum, Induced
- **Request status**: Completed
- **Visual Aspect**: 
- **Molecular comment**: Positive for *Mycobacterium TB complex*
- **Rifampicin resist**: not detected (RpoB mutation not detected)

This result was obtained using the GeneXpert test. This test has the following accuracy in the detection of active pulmonary tuberculosis. These standards are applicable to sputum and not to other specimens.

- **Smear +ve patients**: Sensitivity 87% - 100%
  Specificity >99%

- **Smear -ve patients**: Sensitivity 64% - 71%
  Specificity >98%

The test has the following estimated accuracy in the detection of Rifampicin resistance:
- Sensitivity 95%
- Specificity >98%
Diagnosis – Disseminated TB in SLE

- Disseminated pulmonary TB + abdominal infection (presumed ileocecal tuberculous enteritis)
- Prevalence of TB in SLE patients reported between 3.6 to 11.6%
- Up to 52.4% of patients with SLE have extra-pulmonary TB
Patient progress

- Started on RHEZ
- Discharged on hydroxychloroquine 200mg OM, prednisolone 15mg OM
- Reviewed by ID and Rheumatology outpatient
  - No respiratory nor abdominal symptoms
Take Home Message

- Be aware of high risk of infections in SLE patients
- Fever can still be a sign of infection in immunosuppressed patients
- Do not assume it is a flare of autoimmune disease
- Treat both if co-existing:
  - *Immunosuppressive therapy is permitted with appropriate microbiological treatment (risk vs benefit)*
Other Mimickers

- Rheumatological disorders
  - Vasculitis - multi-system inflammatory condition
  - Still’s disease
  - Overlap Syndrome
- Dermatologic conditions
  - Rosacea
  - Polymorphous light eruption
- Endocrine disorders
  - Autoimmune thyroid disease
Questions?

Thank you