MECHANISMS OF HUMAN DISEASE AND PHARMACOLOGY & THERAPEUTICS

MHD II
Session V

March 4, 2015

STUDENT COPY
Case 1

CC: “The swelling are rash around my eyes is not going away x 2 weeks”

A 68-year old man was feeling well up until 3 weeks prior to presentation to his primary care physician. Three weeks prior, while vacationing in coastal South Carolina he developed heartburn from eating out frequently and started taking over the counter omeprazole. Shortly after returning from his trip he developed a pruritic rash on his right upper arm, scalp and chest. He attributed this to sunburn since he played a round of golf on his last day in South Carolina. Two weeks before admission he woke up and noticed periorbital swelling and redness. He had been working underneath his porch and thought he may have gotten a mosquito bite or been in contact with poison ivy causing the swelling. When the swelling got worse, he presented to an urgent care center and was prescribed fexofenadine and ranitidine and instructed to avoid sun exposure. The swelling did not improve and he returned to the urgent care center 2 days later. He was prescribed a tapering dose of methylprednisolone with instructions to follow-up with his primary care physician.

With respect to the rash, the urgent care physician considered the following dermatoses at the time of his/her evaluation:

- Contact dermatitis
- SLE
- Drug-induced exanthem
- Seborrheic dermatitis

1. Cite data which support, or refute, these potential diagnoses:

While patient noted some improvement in the periorbital swelling with methylprednisolone, he began to feel “lousy and weak”. One night he slept on a recliner in the living room because he did not have enough strength to make it up 10 stairs to his bedroom. The next day made an acute clinic appointment with his primary care physician.

Past Medical History
Diabetes mellitus, type 2
HTN
Hyperlipidemia
**Medications**
Metformin 1000mg bid  
Lisinopril 40mg daily  
Hydrochlorothiazide 25mg daily  
Pravastatin 40mg daily  

**Allergies**
No known drug allergies  

**Social History**
Never smoked. Drinks one glass of wine nightly  
Married and has 5 grown children.  
Retired- worked as a business executive  

**Family History**
Mother died of breast cancer, age 58  
Father died of pulmonary embolism age 49  
1 brother – alive and well  

**Physical exam at PCP’s office:**
BP 128/80, pulse 98 beats per minute, respiratory rate 16/minute, temperature 37°C. He was not in acute distress.  

Skin: There was violaceous periorbital edema, more prominent on the right side than the left side with mild crusting of the skin.  
Scalp had erythematous macular areas  
Right upper arm, neck, upper back had a brightly erythematous, excoriated, morbilliform papular rash.  
Proximal and distal interphalangeal joints had ill defined areas of erythema.  
Lymph nodes: There was no lymphadenopathy  
Thyroid: not enlarged  
Lungs: clear to auscultation  
Heart: S1S2 regular with no abnormal heart sounds  
Abdomen: soft and nontender without organomegaly or masses  
Neurologic exam: The patient could not adjust from lying on the exam table to sitting upright without the use of his arms.  
Exam revealed bilateral symmetric muscle weakness assessed at 4/5 bilaterally.  
Deep tendon reflexes 2+ and symmetric in arms and legs.  
The plantar responses were flexor.  
No fasciculations  
Musculoskeletal: no joint erythema or swelling. Proximal shoulder and hip girdle muscles were tender to palpation.  

2. Develop a problem list:
3. The physician initially develops a broad differential and includes the following: Cite data which supports or refutes the diagnoses:

Myasthenia gravis
Polymyalgia rheumatica
Guillain-Barre Syndrome
Muscular dystrophy

4. The physician is now narrowing the differential diagnosis to causes of acquired myopathies. Why? What should be considered? Should a side effect of any of the patient’s medications be included in the differential diagnosis? Which diagnosis/diagnoses do you favor?

Because of the patient’s rapid clinical decline, he was admitted to the hospital for observation, stabilization and further evaluation.

**Laboratory Evaluation:**

<table>
<thead>
<tr>
<th>CBC</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>WBC</td>
<td>9.0</td>
<td>[4.0-10.0] k/ul</td>
</tr>
<tr>
<td>RBC</td>
<td>3.4</td>
<td>[3.60-5.50] m/ul</td>
</tr>
<tr>
<td>Hgb</td>
<td>10.2</td>
<td>[12.0-16.0] gm/dl</td>
</tr>
<tr>
<td>Hct</td>
<td>30.2</td>
<td>[34.0-51.0] %</td>
</tr>
<tr>
<td>MCV</td>
<td>81</td>
<td>[85-95] fl</td>
</tr>
<tr>
<td>MCH</td>
<td>26.9</td>
<td>[28.0-32.0] pg</td>
</tr>
<tr>
<td>MCHC</td>
<td>33.5</td>
<td>[32.0-36.0] gm/dl</td>
</tr>
<tr>
<td>RDW</td>
<td>17</td>
<td>[11.0-15.0] %</td>
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<tr>
<td>Plt Count</td>
<td>277</td>
<td>[150-400] k/ul</td>
</tr>
</tbody>
</table>
**COMPLETE METABOLIC PANEL**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Reference Range</th>
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<tbody>
<tr>
<td>Sodium</td>
<td>136</td>
<td>[136-146] mm/l</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.5</td>
<td>[3.3-5.1] mm/l</td>
</tr>
<tr>
<td>Chloride</td>
<td>102</td>
<td>[98-108] mm/l</td>
</tr>
<tr>
<td>CO2</td>
<td>27</td>
<td>[20-32] mm/l</td>
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<tr>
<td>Bun</td>
<td>21</td>
<td>[7-22] mg/dl</td>
</tr>
<tr>
<td>Creatinine</td>
<td>1.0</td>
<td>[0.7-1.4] mg/dl</td>
</tr>
<tr>
<td>Glucose</td>
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<td>[70-100] mg/dl</td>
</tr>
<tr>
<td>Albumin</td>
<td>3.2</td>
<td>[3.6-5.0] gm/dl</td>
</tr>
<tr>
<td>Protein, Total</td>
<td>6.4</td>
<td>[6.5-8.3] gm/dl</td>
</tr>
<tr>
<td>Calcium</td>
<td>8.9</td>
<td>[8.9-10.3] mg/dl</td>
</tr>
<tr>
<td>Alk Phos</td>
<td>88</td>
<td>[30-110] iu/l</td>
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<tr>
<td>ALT (SGPT)</td>
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<td>[7-35] iu/l</td>
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<td>AST (SGOT)</td>
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<tr>
<td>Bilirubin, Total</td>
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<td>[0.2-1.4] mg/dl</td>
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<td>Creatine Kinase</td>
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<td>[60-400] U/liter</td>
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<tr>
<td>Aldolase</td>
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<td>[2.0-7.0]U/L</td>
</tr>
<tr>
<td>TSH</td>
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<td>[0.5-5.0] mU/L</td>
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</table>

5. Interpret the laboratory data. Correlate with the clinical scenario.

A biopsy of the patient’s right quadriceps muscle was performed. Histopathologic findings included perivascular mononuclear infiltrates and atrophy of muscle fibers particularly in a perifascicular and paraseptal distribution.
6. Correlating the muscle biopsy results with the clinical data, what is your diagnosis?

7. Is the diagnostic work-up complete? Why or why not? If not, what additional workup would you suggest?
Case 2  
cc: finger and toe pain x 1 month

A 31-year-old man is evaluated for a 1-month history of a painful, swollen left finger and a swollen right toe. He otherwise feels well.

He has no known chronic medical problems. He has taken no medications regularly until the past month when he has begun to take ibuprofen 400mg two to three times daily for the joint pain.

He is married and monogamous. He works as a golf pro at a country club. He has never smoked cigarettes. He drinks 1-2 beers several times per month. He has never used illicit drugs.

On physical examination, vital signs are: BP 114/68, pulse 72/minute, respirations 12/minute, temp 98.7°F, BMI 26.

The left third distal interphalangeal joint is swollen, with localized tenderness to palpation and pain with active and passive range of motion. The fingernail had pitting as did several others.

The right second toe is remarkable for fusiform swelling and mild diffuse tenderness, with decreased active and passive range of motion. There is onycholysis of several toenails, including the left second toenail.

The remainder of the musculoskeletal exam is normal. Examination of the heart, lungs and abdomen is normal.

1. In forming a differential diagnosis, the physician initially considers the following. Cite data from the scenario that supports or refutes each of these diagnoses:
   - Osteoarthritis
   - Rheumatoid arthritis
   - Psoriatic arthritis
   - Lyme arthritis

2. The physician re-examines the extensor surfaces of the skin but does not find characteristic skin lesions. What other sites should be examined?
Case 3

Cc: chest pain x 1 hour

A 27-year old man is brought to the emergency department by paramedics. His friends called 911 when the patient complained of severe chest pain. He does not answer many questions asked by the ED staff. However, he does state that the chest pain had been ongoing for the past hour and that he needs a “smoke now”. He states he is “healthy”. When asked he denies using any illicit drugs.

On physical exam the patient is agitated and not very cooperative. His blood pressure is 173/98 (equal in both arms) and his pulse is 122 bpm. His pupils are equal and dilated. Conjunctiva are anicteric. The nose is inspected and shows perforation of the nasal septum. Lung, heart, and abdominal exams are unremarkable except for tachycardia. He has no “track marks”.

The EKG shows sinus tachycardia and ST segment elevation in leads I and AVL

Initial troponin is 2.78 [0.00- 0.04] ng/ml. Urine drug screen is pending.

1. Based on the given history, acute intoxication with which of the following is suspected?

Barbiturate
Benzodiazepine
Cannabinoid
Cocaine
Opiate
PCP

Discuss your rationale.
2. Based on the mechanism of action of this drug, postulate why chest pain and coronary ischemia/infarction developed.

3. The American College of Cardiology and the American Heart Association have issued guidelines recommending against the use of a particular class of medication in patients with acute coronary syndromes related to the use of this illicit drug. Applying your knowledge regarding the pathophysiology of this illicit drug, name the medication class, which drug(s) in the class are of particular concern, and the rationale of the ACC/AHA.

4. Discuss other potential strategies for controlling this patient’s chest pain and elevated blood pressure.

5. Provide an explanation for the physical exam findings of the nose.

Case 4 – Unknown
Students will not have the case data until the session meets.