MECHANISMS OF HUMAN DISEASE
AND
PHARMACOLOGY & THERAPEUTICS

CASE-BASED SMALL GROUP DISCUSSION

SESSION XIII
MHD I

November 13, 2014

STUDENT COPY

Case 1

CHIEF COMPLAINT: "I am very tired and now my chest hurts."

HISTORY: The patient is 29 year-old woman who has noticed left sided chest pain for the past few weeks. Prior to the onset of her chest pain, she had increasing fatigue but she attributed it to the planning and "stress" of her wedding last month. Not only was her hair falling out at the time but she also was told she might have syphilis after her premarital blood test. During her honeymoon 2 weeks ago in St Martin she began to notice sharp stabbing pains over her left chest that were much worse when she was sitting or taking a deep breath. Now she is so tired in the early morning that she has missed several days at work.

PAST MEDICAL HISTORY: The patient has been in good health until recently.

REVIEW OF SYSTEMS: Her period is 10 days late and she is worried that she could be pregnant even though she has taken her oral contraceptive correctly. She had a very tender calf muscle for 2 days after returning from her honeymoon. Review of systems is otherwise negative.

PHYSICAL EXAMINATION:

VS: HR 90 and regular, BP 122/85, R 20, T 37.9 C orally.
Head: Approximately 8-10 strands of hair can be pulled out with gentle tug; also suggestion of temporal balding
Mouth: shallow gingival ulcer with non-purulent base
Lymphoid: multiple enlarged, non- tender cervical, axillary and femoral nodes.
Neck: supple with full range of motion.
Lungs: both lungs are resonant by percussion; auscultation reveals normal breath sounds over the right base but diminished breath sounds over the left base.
CV: percussion of the heart reveals no abnormalities. S1 and S2 are normal. There is a faint late diastolic and early systolic scratch sound at the LLSB.
Abd: soft and non-tender with no evidence of liver or spleen enlargement.
Ext: examination of the fingers reveals normal color and temperature with no evidence of gangrenous changes. No synovitis is present and there is full range of movement in all joints.
Skin: Deeply tanned with a faint erythematous maculopapular rash over the cheeks, bridge of the nose and upper chest and arms.
Neuro: nornal

INITIAL LABORATORY ASSESSMENT:

CBC w/Diff

WBC	3.0	[4.0-10.0] k/ul
RBC	2.44	[3.60-5.50] m/ul
Hgb	8.0	[12.0-16.0] gm/dl
Hct	24.1	[34.0-51.0] %

MCV	83	[85-95] fl
MCH	28	[28.0-32.0] pg
MCHC	32.1	[32.0-36.0] gm/dl
RDW	15.3	[11.0-15.0] %
Plt Count	75	[150-400] k/ul
Manual Diff		
Gran	85	[45-70] %
Lymph	9	[20-45] %
Mono	5	[0-10] %
Eo	1	[0-7] %
Baso	0	[0-2] %

Complete Metabolic Panel

Glucose	72	[70 - 100]	mg/dl
Blood Urea Nitrogen	12	[7 - 22]	mg/dl
Creatinine	2.1	[0.7 - 1.4]	mg/dl
Calcium	8.0	[8.5 - 10.5]	mg/dl
Sodium	136	[136 - 146]	mmol/L
Potassium	4.0	[3.5 - 5.3]	mmol/L
Chloride	104	[98 - 108]	mmol/L
Carbon Dioxide	24	[20 - 32]	mmol/L
Albumin	3.0	[3.6 - 5.0]	gm/dl
Protein, Total	9.5	[6.2 - 8.0]	gm/dl
Alkaline Phosphatase	33	[25 - 215]	IU/L
AST	35	[5 - 40]	IU/L
Bilirubin, Total	0.6	[0.2 - 1.4]	mg/dl

Prothrombin Time

Prothrombin Time	12.1	[11.8-13.2] sec
INR Ratio	1.0	

APTT

APTT	68	[22.9-34.3] sec

UA w/Micro

Color	yellow	[YELLOW]
pH	5.5	[4.5-8.0]
Spec Gravity	1.010	[1.003-1.035]
Protein	2+	[NEG]
Blood	SML	[NEG]
Glucose	NEG	[NEG]
Ketones	NEG	[NEG]
Bilirubin	NEG	[NEG]
Urobilinogen	0.2	[0.2-1.0] eu/dl
NITRATE	NEG	[NEG]
LEUKOCYTES	NEG	[NEG]
RBC	5-10	[0-2] /hpf
WBC	0-2	[0-5] /hpf

Erythrocyte Sedimentation Rate

SED RATE 100 [0-20] mm/h

Antinuclear Antibody Screen

ANA screen PENDING

Micro – **Blood Culture** (Final)

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 Specimen Description -Blood
     Special Requests -None
      Culture Results -no growth after 5 days
        Report Status - Final
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 Specimen Description -Blood
     Special Requests -None
      Culture Results -no growth after 5 days
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Educational Objectives

1. Explain how the clinical clues presented strongly suggest this patient has a systemic inflammatory disease and what that disease most likely is.

2. Explain how the laboratory findings support the clinical findings of this patient's systemic inflammatory disease.

3. Describe "autoimmune epidemiology".

4. Justify and outline further workup for her disease. Predict the outcome of specialized testing for autoantibodies in this patient and how the results define the extent of laboratory workup for making the correct diagnosis.

5. A kidney biopsy was performed in this patient.
a) Summarize the pathogenesis of nephritis in this disease process.
b) List the six patterns of glomerular disease
c) This patient's biopsy showed diffuse proliferative glomerulonephritis (Type IV). Describe the histologic findings likely seen on this patient's biopsy and the associated prognosis.
d)Which pattern presents with overt nephrotic syndrome?

6. There are clinical and laboratory features in this patient that point to a significant complicating factor - the antiphospholipid antibody syndrome. What are they and what additional testing do they mandate?

7. What is the fundamental strategy in the treatment of her underlying disease? Realizing that there is intense controversy over what is THE definitive or “curative” treatment of her disease, use your Host Defense concepts (What type of “hypersensitivity syndrome” does she have?) and get creative in the discussion on how you would treat her. Consider the likelihood that she may not tolerate a chemotherapy approach and construct a monoclonal antibody that might work. You may be surprised-there is already one out there!

8. Is future pregnancy an option for this patient?

9. Review Case Images – Renal Set 2

Case 2

History of Present Illness
A 43-year old man presents to the emergency department with abdominal pain which started several hours prior. He describes the pain as excruciating and sudden in onset. It originated in the right lower quadrant and radiated to his right groin and flank. It decreases slightly when he is lying down but is otherwise unaffected by position. He reports nausea and one episode of nonbloody, nonbilious emesis shortly after the onset of the pain.
Two weeks before presentation the patient experienced a less severe episode of similar pain but in his left lower quadrant which radiated to his left flank. The pain resolved on its own.
The patient has had no fevers or chills, no change in bowel habits- has “normal” bowel movements, no urinary symptoms, no hematuria, no chest pain

Past Medical/Surgical History
s/p tonsillectomy at age 5

Medications
None

Drug allergies
None

Social History
Tobacco – active smoker, 1ppd x 26 years
Alcohol – 1-2 beers, 2-3 times per week
Illicits – denies use of illicit drugs including cocaine, heroin, marijuana
Married, monogamous
Works as a bartender in an upscale hotel

Family History
Mother – coronary artery disease, MI at age 49
Father – HTN and atrial fibrillation
1 younger brother – alive and well

Review of Systems
General – has had generalized fatigue over the past several months, no weight loss
Otherwise ROS negative or reported in HPI

Physical Exam
Patient appears uncomfortable
Temperature 37.5^{0}C, Pulse 92 beats/minute and regular, blood pressure 186/114 right arm; 180/110 left arm; respiratory rate 18/minute
Oxygen saturation on room air 96%
Head, neck, lung, heart exams unremarkable
Pulses equal in bilateral upper and lower extremities
Abdomen – normal on visual inspection; normal, active bowel sounds, no bruits on auscultation; soft, diffuse nonfocal tenderness on deep palpation in all quadrants, no rebound or guarding; no palpable masses or hepatosplenomegaly, no hernias

GU exam – testes nontender and symmetric
Back – bilateral costovertebral tenderness right > left
Neurologic - CN II-XII intact; the patient has weakness of right foot dorsiflexion and weakness of left wrist extensors.
Skin – no rashes or skin lesions

1. Develop a differential diagnosis for the etiologies of flank pain.

Initial Laboratory Evaluation:

<u>CBC</u>

Test	Result	Reference range
WBC	14.2	[4.0-10.0] k/ul
RBC	3.80	[3.60-5.50] m/ul
Hgb	12.6	[12.0-16.0] gm/dl
Hct	37.8	[34.0-51.0] %
MCV	90	[85-95] fl
MCH	29.1	[28.0-32.0] pg
MCHC	33.7	[32.0-36.0] gm/dl
RDW	15.1	[11.0-15.0] %
Plt Count	215	[150-400] k/ul
Diff		
Gran	78	[45-70] %
Gran #	11.1	[2.0-7.0] k/mm3
Lymph	14	[20-45] %
Lymph #	1.99	[1.0-4.0] k/mm3
Mono	8	[0-10] %
Mono #	1.13	[0.0-1.0] k/mm3
Eo	0	[0-7] %
Eo #	0	[0.0-0.7] k/mm3
Baso	0	[0-2] %
Baso #	0.0	[0.0-0.2] k/mm3

<u>Basic Metabolic Panel</u>

Test	Result	Reference range	Units
Glucose	97	[70 - 100]	mg/dl
Blood Urea Nitrogen	8	[7 - 22]	mg/dl
Creatinine	1.7	[0.7 - 1.4]	mg/dl
Calcium	9.3	[8.5 - 10.5]	mg/dl
Sodium	134	[136 - 146]	mmol/L
Potassium	3.7	[3.5 - 5.3]	mmol/L
Chloride	106	[98 - 108]	mmol/L
Carbon Dioxide	21	[20 - 32]	mmol/L

LIVER FUNCTION PANEL

Test	Result	Range	Units
Albumin	3.8	[3.6-5.0]	gm/dl
Bilirubin, Total	1.3	[0.2-1.4]	mg/dl
Bilirubin, Direct	0.3	[0.0-0.3]	mg/dl
Alkaline Phosphatase	98	[30-110]	iu/l
AST (SGOT)	25	[5-40]	iu/l
ALT (SGPT)	28	[7-35]	iu/l
Protein, Total	6.9	[6.5-8.3]	gm/dl

UA w/Micro

Test	Result	Range
Color	YELLOW	[YELLOW]
pH	6.0	[4.5-8.0]
Spec Gravity	1.043	[1.003-1.035]
Protein	1+	[NEG]
Blood	NEG	[NEG]
Glucose	NEG	[NEG]
Ketones	NEG	[NEG]
Bilirubin	NEG	[NEG]
Urobilinogen	0.2	[0.2-1.0] eu/dl
NITRATE	NEG	[NEG]
LEUKOCYTES	NEG	[NEG]
RBC	0-2	[0-2] /hpf
WBC	0-2	[0-5] /hpf

Test	Result	Range	Units
Amylase	64	[25-125]	iu/l
Lipase	17	[7-58]	iu/l

Prothrombin Time

Test	Result	Range
Prothrombin Time	12.1	[11.8-13.2] sec
INR Ratio	1.1	
APTT	22.0	[21.6-33.2] sec

2. Interpret the laboratory findings. Correlate with the clinical findings. Do these findings support the differential diagnosis you developed?

Additional questions #3-11 will be provided during the small group session. Students are asked to consider further diagnoses and additional diagnostic tests in preparation for the discussion. (it would be a good idea to review the vasculitidies)