

Infectious Disease Emergencies and Failure to Diagnose

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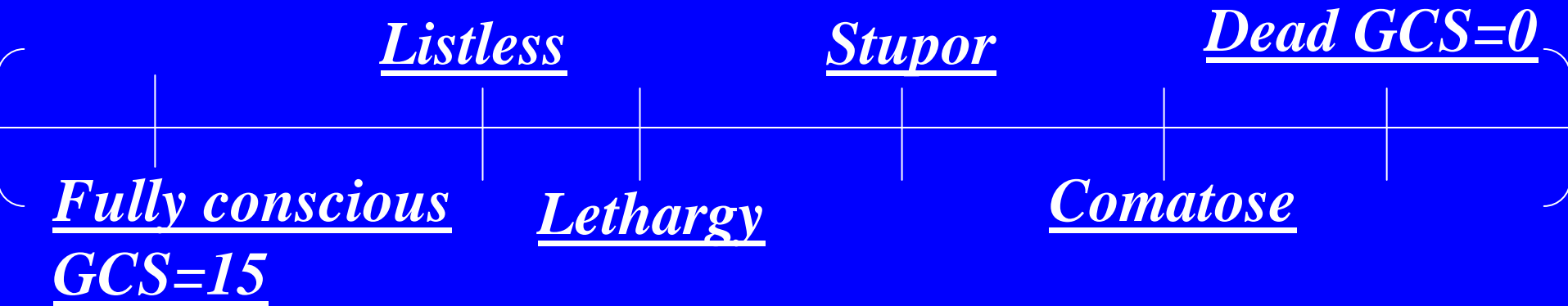
Case 1

- Severe localized pain in an area with what is seemingly a minor skin or soft tissue lesion. The patient also has marked systemic toxicity with little response to Nsaids.
- DX Necrotizing Fasciitis

Common Definitions

- Listless – a state of abnormal drowsiness including having no interest in what is going on about one self (apathy) due to illness associated with fatigue
- Lethargy – a state of deep and prolonged unconsciousness, resembling profound sleep from which one can be aroused but relapses immediately associated with profound fatigue, sluggishness, dullness
- Stupor – a state of impaired consciousness in which one shows a marked diminution in reactivity to environmental stimuli
- Comatose – a state of profound unconsciousness from which one cannot be aroused

Level of consciousness continuum



Glasgow Coma Scale

Parameter	Response	Response	Score	
Eyes	Open	Spontaneously	4	
		To verbal command	3	
		To pain	2	
		No response	1	
Best motor response	To verbal command	Obeys	6	
		To painful stimuli	Localizes Pain	5
			Flexion withdrawal	4
			Decorticate (flexed)	3
			Decerebrate (extended)	2
			No response	1
Best verbal response		Oriented, converses	5	
		Disoriented, converses	4	
		Inappropriate responses	3	
		Incomprehensible sounds	2	
		No response	1	

Case 5

- Patient status post cholecystectomy POD#3 with tachypnea, tachycardia, B.P. = 92/64 previous B.P. = 150/90, WBC = 15,000, altered mental status.

- Dx Septic Shock

Case 7

- Fever, localized back pain, lower extremity paralysis with bowel and bladder involvement.
- Dx Paraspinal epidural abscess

Case 11

- A patient with fever, abdominal pain with diffuse rebound tenderness, elevated WBC count with bandemia on peripheral blood smear.

Dx Acute Abdomen (Cholecystitis/cholangitis, appendicitis, diverticulitis, pancreatitis, perforated viscous)

Mistakes by primary care physicians resulting in serious consequences (IDSA survey)

- Necrotizing soft tissue infection
- Spinal Epidural abscess
- Sepsis
- Endocarditis
- Meningitis
- Tuberculosis
- Herpes Encephalitis
- Intraabdominal sepsis
- Aids and Aids complications
- Brain Abscess
- Toxic shock syndrome
- Asplenia
- RMSF
- Malaria and travel medicine
- Epiglottitis
- PID
- Other vector borne, fungal and osteomyelitis

Infectious Disease Emergencies

- Sepsis
- Meningitis
- Encephalitis
- Toxic Shock syndromes
- Infective Endocarditis, Myocarditis and Pericarditis
- Epiglottitis
- Necrotizing Fasciitis
- Tick Born Illness
- Tetanus
- Botulism
- Malaria
- Sphenoid sinusitis
- Spinal Epidural abscess
- Plague

Historical Pertinents and the Infectious “flu like” Illness

- Gradual onset or sudden?
- Worst headache?
- Severe N/V? Projectile(unusually forceful vomiting)?
- Exceptional painful and/or bloody diarrhea?
- Associated dyspnea?
- Localizing severe pain or discomfort?
- Dysuria associated with back pain?
- Medications and fever?
- Has patient ever experienced this before?
- New onset or prior history of murmur?

Historical Pertinents and the Infectious “flu like” Illness

- Tick exposure?
- Ill contacts?
- Pregnancy/recent abortion?
- Sexual risk factors/IVDA?
- Travel?
- Pets?

Physical Exam Pertinents and the Infectious “flu like” Illness

- Toxic appearance?
- Vital signs subtle abnormalities including pulse oximetry?
- Splinter hemorrhages (nail beds), Oslers Nodes, Palmer rash?
- Rash, needle tracks, embedded ticks?
- Tenderness over vertex of nose?
- Otitis Media, Mastoiditis, Pharyngitis?
- Conjunctival hemorrhages, Roth spots on retina?
- Dental hygiene, Thrush?

Physical Exam Pertinents and the Infectious “flu like” Illness

- Neck supple, Lymphadenopathy, Brudzinski, Kerning's, Limited range of motion?
- Localized tenderness over vertebra or other bony or joint area tenderness, coexisting ulcer or cellulitis?
- Rales, rhonchi, rubs or quiet breath sounds present?
- Murmur, friction rub, or gallop on cardiac exam?
- Localized or diffuse abdominal tenderness, rigidity/rebound, murphy's, ascites, organomegaly?

Physical Exam Pertinents and the Infectious “flu like” Illness

- Lesions, discharge on genital, pelvic and rectal examinations?

DDX Nonhemorrhagic Shock in a Previously Healthy Individual

- RMSF
- Meningococemia
- Toxic shock syndrome
- Sepsis
- Endocarditis
- Heatstroke
- Addisonian Crisis

Toxic shock syndrome

- Staphylococcal
 - TSS toxin 1, enterotoxin B
 - 15-30 yrs, women
 - Tampons, NSAIDs
 - Flu like illness 2-3 days prior to shock
 - Tissue necrosis rare
 - Hypotension present
 - Renal failure common
 - + blood cultures rare
 - Mortality <3%
- Streptococcal
 - Pyrogenic exotoxins A and B
 - 20-50, either sex
 - Skin infection (cuts, burns, bruises, varicella, cellulitis, NSAIDs)
 - Flu like illness usual acute severe pain
 - Tissue necrosis common
 - Hypotension present
 - Renal failure common
 - + blood cultures 60%
 - Mortality 30-70%

SIRS (Systemic Inflammatory Response Syndrome)

- Fever (temperature $>100.4\text{F}$ or 38C) or hypothermia (temperature $<96.8\text{F}$ or 36C)
- Tachycardia (HR $>90\text{BPM}$)
- Tachypnea (RR $>20\text{breaths/min}$ or PaCO₂ $<32\text{mmHg}$)
- WBC $> 12,000$ or $< 4,000$ or $>10\%$ [band] immature forms

Forms of Sepsis

- Sepsis = SIRS plus clinical evidence of infection (+ cultures)
- Sepsis Syndrome = Sepsis plus evidence of impaired organ perfusion (Altered Mental Status, Oliguria, Lactic Acidosis, Hypoxemia)
- Severe Sepsis = Sepsis plus organ dysfunction, hypoperfusion, or hypotension (defined as SBP , 90 or reduction >40 mm Hg)
- Septic shock = Sepsis with hypotension despite adequate fluid resuscitation (persisting >1hour) + other findings in severe sepsis
- Old term Septicemia = sepsis and + BC
- Bacteremia = Bacteria in the blood

Biochemical Mediators in Sepsis

- Endotoxin and other molecules (present in gram - and gram + cell walls) interact with Factor XII, endothelial cells, monocytes and macrophages, neutrophils, and the complement system resulting in an inflammatory response, mediated by cytokines. There is further production and propagation of bradykinin, coagulation, and fibrinolysis.

Cardiogenic versus Septic Shock

- Low Cardiac Output with Variable Peripheral Resistance
- Variable Cardiac Output with Low Peripheral Resistance

Meningococemia

- *N. meningitidis*
- > 90% occur in children under 2
- Petechial rash in > 60% of cases, usually begins distally and moves centrally, may present as macular or maculopapular rash instead
- Index of suspicion in patients with nonspecific flu like illness and fever, H/A, N/V, malaise/listlessness, neck pain/stiffness other neurological findings or baseline mental status changes/behaviors
- Progresses very rapidly
- Other bacterial organisms responsible for meningitis include *Strep Pneumonia*, *E.Coli*, Group B *Strep*, *H. Influenza*,

Sepsis Management

- ABC's, O2, IV, Intensive monitoring, Complete H&P
- CBC, Comprehensive metabolic panel, PT/PTT,
- Blood Cultures
- Urine chemistry and cultures, Other pertinent cultures (potential source specific),
- CXR
- EKG
- Lumbar Puncture
- CT (pertinent regions head, chest, abdomen if so indicated), MRI, U/S
- Bone Scan
- Echocardiography

Sepsis Management

- Support systemic circulation and perfusion, Pressor agents?
- Broad empiric coverage if source unclear pending cultures/sensitivities and more definitive workup and identification of regional source.
- Manage hypoxia and ARDS, Corticosteroids consideration in ARDS?
- Sepsis mediator antagonists steroids not useful
- Nutrition (TPN, PPN) and other supportive measures

Buddy Check

- Educate about ominous signs and symptoms, and on when to seek immediate medical attention
- Have family member monitor patient including awakening from sleep on several occasions during night

Complications

- Circulatory collapse, and High output heart failure
- Cerebral anoxia,
- Dysrhythmias
- Stress ulceration
- DIC, Spontaneous hemorrhage
- Addisonian Crisis
- ARDS
- MODS (Multiorgan dysfunction syndrome)
- Seizures, Coma, Death

Questions???