Project: Ghana Emergency Medicine Collaborative

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Evaluation of Hematuria

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Objectives

- Describe the evaluation and management of gross hematuria
- Describe the evaluation and management of microscopic hematuria

Case Presentation

- 34 year old female presents with depression and suicidal ideation
  - Recent divorce, not sleeping well
  - Otherwise healthy
  - Normal physical exam
  - CBC, Basic, UDS all normal

Case Presentation

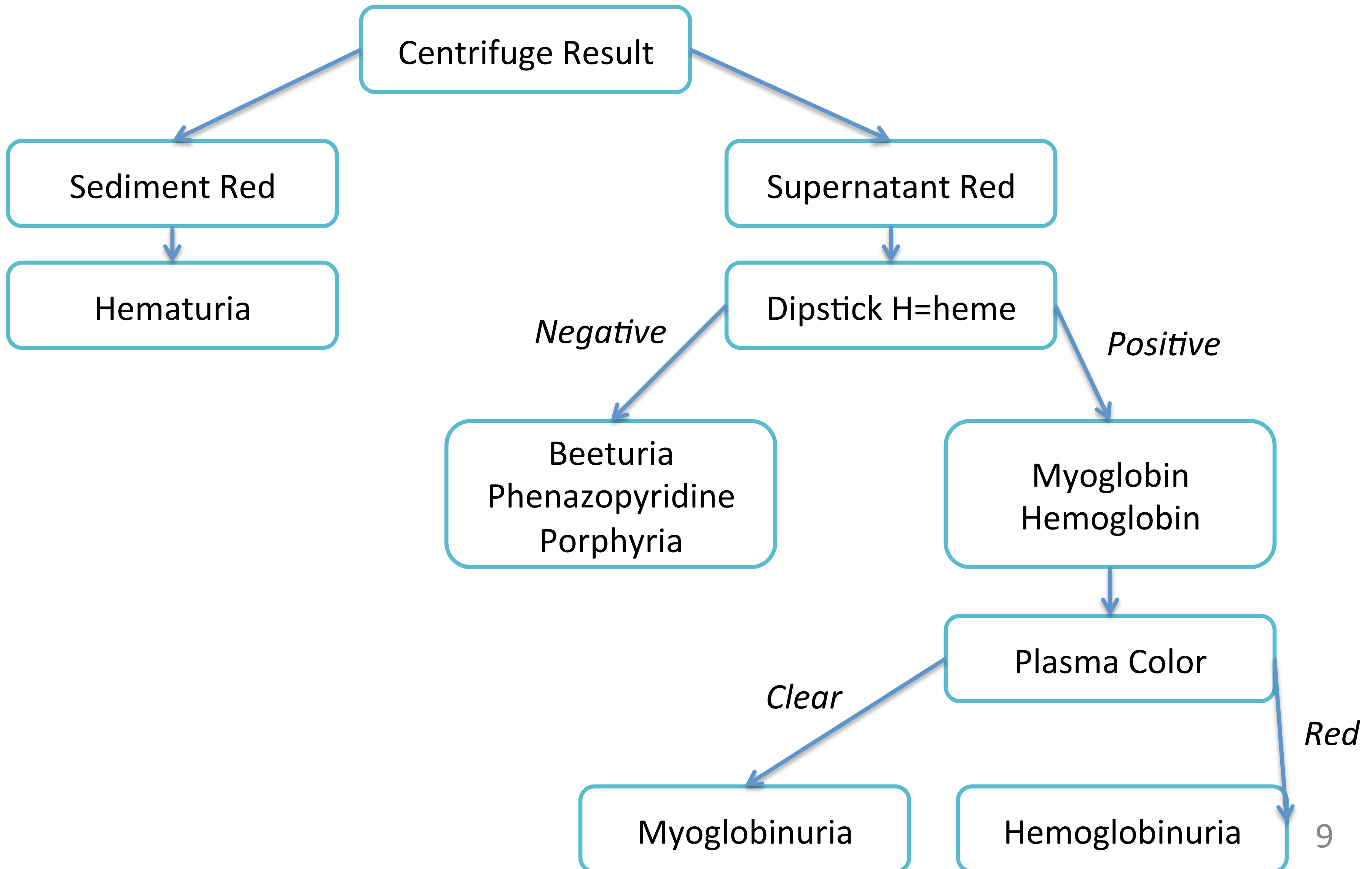
- Urinalysis
  - Normal except
    - 1+ blood
    - Tr protein
    - 2 WBC
    - 12 RBC
    - 2 epi
    - No bacteria

- Is this patient medically cleared for psych admission?
- What further evaluation is necessary

Does this patient have hematuria?

- Hematuria
- >2-3 RBCs per HPF
- Microscopic hematuria
  - Yellow urine
  - Concentration
- Gross hematuria
  - Red/brown urine
  - 1 ml blood
  - Presence of clots = post glomerular disease

Does this patient have hematuria?



Evaluation of hematuria

- Clues from history and physical
- Glomerular vs. Extraglomerular
- Transient vs. Persistent

History

- Infection symptoms?
  - Cystitis: dysuria, frequency
  - Pyelonephritis: flank pain, fever
  - Recent URI?
- Flank pain, especially unilateral
  - Stone
  - Blood clot
  - Malignancy

History

- Symptoms of prostatic obstruction
  - BPH
  - Malignancy
- Coagulopathy
  - Therapeutic range
  - Culclaure TF *Arch Intern Med* 1994
    - Rate of hematuria in treated and controls equal
    - 81% with hematuria had identifiable cause

History

- Relationship with menstruation
  - Endometriosis
  - Contamination
    - Collection of urine specimen
- Sickle cell disease/trait
- Hereditary disorders
  - Polycystic kidney disease
  - Hereditary nephritis

Glomerular vs. Extraglomerular

- Urinalyis
  - Red cell casts
  - Proteinuria
    - > 1+
    - Not seen in gross hematuria
  - Red cell morphology
    - Deformed as they pass thru basement membrane
    - Osmotic injury in nephron
  - Urine color
    - Smoky brown = methemoglobin
  - Blood clots

Transient vs. Persistent

- Transient usually benign
  - Infection
  - Stones
  - Exercise
- May be seen in patients with malignancy

Risk-factors for Malignancy

- Age > 40
- Smoking history
- Occupational exposures
  - Printers, painters, chemical plant workers
- Gross hematuria
- Chronic irritative voiding symptoms
- History of pelvic irradiation
- Analgesic abuse

Case 1

- 22 yo female
  - 2 days of dysuria, frequency, urgency
  - Now with hematuria
  - No fever, no flank pain
  - LMP 2 weeks ago, not sexually active
  - Normal VS
  - Suprapubic tenderness on exam

Case 1

- Further evaluation?

Case 1

- Over the counter meds?
- Urinalysis
  - Bloody urine
  - 1+ Leukocyte esterase
  - > 100 WBC
  - > 100 RBC
  - 2+ bacteria

Urinary Tract Infection

- Does this patient need a urine culture?

Urinary Tract Infection

- Urine culture in
  - Relapse
  - Suspicion for pyelonephritis
    - Flank pain
    - Fever
- Treatment
  - Phenazopyridine
  - Antibiotics
    - 3 days
    - 7 days

Case 2

- 43 yo male, previously healthy
- Gross hematuria 2 days ago
- Acute onset of severe right flank pain
  - Radiates to groin
  - Diaphoresis, nausea, emesis X 1
  - Can't find comfortable position
  - Mild right CVA tenderness

Case 2

- Initial treatment?

Case 2

- Initial treatment
  - IV toradol, anti-emetics, narcotics prn
  - Urinalysis
    - 1+ blood
    - 12 RBC
    - No WBC, bacteria
  - IV fluid bolus?

Renal Colic

- Passage of stone from kidney to bladder
- Localization of pain often related to site of stone
  - Lower ureter/UVJ groin
- Family history
- Recurrence
- Concomitant infection
- Mimics
  - AAA
  - Ectopic pregnancy

Renal Colic

- Non-contrast CT
  - Sensitivity 95%
  - Specificity 99-100%
  - Other diagnosis
  - Use with KUB
- USN
  - Obstruction
  - In ability to give contrast
  - Recurrent stone

Renal Colic

- NSAIDs
- Narcotics
- Calcium channel blocker
- Alpha blocker
- Size and location

Case 3

- 73 yo male
  - Gross hematuria for 2 days
  - Unable to void for past 8 hours
  - Mildly hypertensive
  - Obvious distress
  - Bladder distention on physical exam
  - Foley catheter
    - Bloody urine
    - Blood clots

Case 3

- Next steps?

Case 3

- CBC
- Basic
- Coumadin: INR
- Urinalysis, Urine culture
- Bladder irrigation

Gross Hematuria

- Infection 25%
- Stone 20%
- VS seldom unstable
- Assure urinary drainage
  - History of blood clots
  - Size of clots
  - Ease of passage of urine

Gross Hematuria

- Clot retention
  - Foley catheter
    - 16 F or larger
    - Three-way catheter
    - Discharge with catheter vs. removal
- Followup

Case 4

- 31 yo male
- Completed first marathon
- Blood in urine
- U/A
  - Red urine
  - >150 RBC
  - No WBC, bacteria, protein

Exercise-induced Hematuria

- Contact sports
- Non-contact sports
  - Long-distance running
    - 10-20%
  - Rowing
  - Swimming
  - Cycling

Exercise-induced Hematuria

- Mechanism
  - Increased urinary excretion
  - Long-distance running/cycling
    - Bladder trauma
  - Bicycling
    - Urethra trauma
  - ? Renal ischemia
  - Nutcracker syndrome

Exercise-induced Hematuria

- Rule-out myoglobinuria
- Followup
  - Clears within one week
  - Consider full workup with risk factors for malignancy

Case 5

- 34 yo female with 1 week of progressive swelling in the lower extremities
- No chest pain, dyspnea, orthopnea, abdominal pain or distention
- VS 148/92 88 14 98.3 99%
- Exam normal except for 2+ pre-tibial pitting edema

Case 5

- CBC normal
- Basic normal except BUN 24 Creat 1.42
- U/A
  - 3+ protein
  - 12 RBCs
  - No WBCs, bacteria

Glomerulonephropathy

- ED care is usually supportive
  - Treat hypertension if emergency/urgency
  - Close followup
  - Admission criteria
    - Acute renal failure
    - Hypertensive emergency/urgency
    - Oliguria/anuria
    - Electrolyte abnormalities
    - CHF/volume overload