10/04/24 Morning Report with @CPSolvers

***"One life, so many dreams" Case Presenter**: Nicole Zaki* ***Case Discussants**: Rabih Geha (@rabihmgeha) and Reza Manesh (@DxRxEdu)*

CC: 28 year old with fever & pancytopenia

HPI: **presented to a nursing station** with 2-3 days of lethargy, tachypnea, fever.
One week prior: *Sore throat* for which she received 3 days x ceftriaxone for "strep throat/tonsillitis"--> subsequently lost to follow-up and did not receive more antibiotics.Given her decreased LOC, she was **Transferred to tertiary care centre**:- she noted neck pain, dysphagia due to sore throat and dyspnea. Also had non bloody emesis over the past day. No chills, night sweats, weight loss.
Acute presentation (felt well prior- 1 week ago)
- ROS: headache, vision change, chest pain, palpitations, cough, abdominal pain, diarrhea, hematochezia/melena, urinary sx,arthralgia/arthritis, oral sores

PMH: 1.**Type 2 DM**
2.**Hyperthyroidism**
3.**H.pylori** (confirmed on UGIE)--> not treated

Meds:
1.methimazole 15 mg (non-compliant)--> last taken 2 weeks ago for 1 week
2.Insulin glargine
3.Insulin lispro
4.Rabeprazole 20 mg
5.Atenolol 50 mg

Fam Hx: —
Soc Hx: lives in a remote community in Manitoba
Health-Related Behaviors: No alcohol/inj drug use; Cocaine a few days ago

Allergies: penicillin (childhood)

Vitals: BP:160/70 **HR:**132(NSR) **RR:**32 **Tmax:**39.2 **SpO2:**97% on room air
Exam: Gen: unwell, drowsy, diaphoretic, hoarse voice
HEENT: tonsils mildly enlarged and erythematous, cervical lymph nodes mildly enlarged and moderately tender, no conjunctival injection, oral sores/exudates, neck supple with negative Jolt sign, no alopecia
CV: normal S1,S2; extremities hot to touch, no peripheral edema, no EHS
Pulm: tachypneic with increased work of breathing, clear lung fields
Abd: significantly tender epigastrium, mildly tender throughout, no peritonitic signs, no clinical evidence of ascites
Neuro: unremarkable, no tremors; **Extremities/skin:** no rash/open wounds

Notable Labs & Imaging:
Hematology: (baseline-3 months ago)
Hgb:89(100-120 baseline)|MCV:80.1|WBC:0.5 (from 8)|Plt: 39 (from 200)|Retics: 18 (LLN:20)
Chemistry:
Na:150|K:4.4|Cl:118|HCO3:14|AG:16|BUN:8.1|Cr:57(40-100)|
AST:nl|ALT:nl|T.Bil:nl|Albumin:14(normal-40)|Lipase: 892| LDH:nl| CRP:224|Beta hcg negative| CK:nl, myoglobin:nl|INR:1
Thyroid function test: TSH<0.15|T4:29|T3:4.3
[*3 months ago*⟶ undetectably low TSH, elevated T4(50) and T3(12.6)]
VBG: pH:7.5, CO2:23, Bicarb:18, Lactate:2.2
UA: few hyaline casts , otherwise bland
Urine culture: negative| Blood culture: ⅛ cultures⟶ Staph epidermidis
Blood smear: no schistocytes, increased echinocytes and acanthocytes
HIV, HBV, HCV, syphilis -ve|EBV IgM -ve,IgG +ve|CMV IgM,IgG +ve|Parvovirus IgM -ve,IgG +ve
Imaging:
CT neck: extensive b/l cervical chain and supraclavicular chain LAD with surrounding fat stranding, prominence of b/l tonsillar tissues. No abscesses/epiglottitis, airway patent
CTAP: unremarkable
CTPE: no PE, L>R consolidation with air bronchograms⟶ pneumonia
Bone marrow aspirate and biopsy: no evidence of B- cell lymphoproliferative disorder or plasma cell neoplasm. Decrease in all 3 cell lines, not consistent with aplastic anemia

Course: Hematology, Endocrinology, ID consulted! Started on G-CSF(later stopped), Meropenem-Vancomycin, 3 days of azithro; stopped methimazole

Dx: Cytomegalovirus (CMV) Mononucleosis

Problem Representation: A 28 years old female with PMH of hyperthyroidism on methimazole, T2DM on insulin p/w fever, tachycardia, HTN and sore throat. Labs reveal pancytopenia w/severe neutropenia and CMV IgM+. Most c/w CMV acute mononucleosis.

Teaching Points(Mukund):

Fever thought train: r/o hyperthermia -> fever = inflammation; infection > others
Pancytopenia schema:
- **Marrow infiltration**
  - Granulomatous (TB, fungal, sarcoid)
  - Malignant (can't miss APML in this age range)
    - 20% of acute leukemias start off "aleukemic"
- **Marrow failure**
  - Toxin (e.g. alcohol)
  - Nutritional deficiencies (B12, Folate, Cu, Zn)
  - Viral cytokine-mediated marrow suppression (HIV, Hep)
  - **Immune destruction**
- **Peripheral process**
  - Destruction
  - Sequestration (i.e. hypersplenism)

What is a sore throat? Pharyngitis/adenitis/abscess/structural problem etc.
Nonthyroid manifestations of Graves:
- Graves ophthalmopathy; pretibial myxedema; hypertrophic osteoarthropathy; and *splenomegaly (up to 10% of cases)!*

Jolt sign: rapid rotation of the head -> pain -> could be indicative of meningeal irritation.
Fever, pancytopenia & sore throat: consider viral causes - (HEC: HIV, EBV, CMV)
Methimazole-induced agranulocytosis: starts as prominent leukopenia w/mild anemia and thrombocytopenia. For unknown reasons, 90% have fever and 80% have sore throat when this reaction pattern develops.
Lab abnormalities: [hypernatremia -> dehydration (needs D5W + thiamine)**] [AGMA** -> in a pt w/hx DM, consider ketosis**] [NAGMA** - ddx broad but includes renal etiologies**] [pH 7.5** -> compensatory respiratory alkalosis**]**
Delta-delta ratio: Δ(AG - 2.5*albumin) / Δ(24 - bicarb); <1 = mixed acidosis
Symptoms of thyrotoxicosis: fever, tachycardia, AMS, CNS agitation, GI upset, jaundice; is this pt's sore throat in fact an inflamed thyroid gland?
Iodinated contrast may contribute to thyrotoxicosis!
Treatment of thyroid storm: 4Ps (methylPrednisolone; Lugol's Potassium iodide solution; Propylthiouracil; Propranolol).
Cholestyramine/colestipol: enhance enterohepatic excretion of thyroxine!