Eosinophilia

Eosinophilia - Generally accepted as > 450 eos/microliter. Technically, eosinophilia is an accumulation of eos in the blood or tissue. Eos tightly regulated by body, usually only 1-3% of peripheral blood leukocytes. - small # in peripheral blood, and in tissues majority are in GI tissues

ETIOLOGY Most common cause worldwide is helminthic infxn, most common cause in industrialized nations is atopic disease. Many use the mnemonic NAACP: Neoplasm, Addison’s, Allergy, Collagen Vasc Dz, Parasites

- **Parasites**: Usually helminthic (worms)- requires tissue invasion to trigger eosinophilia, not just presence in the gut (further broken down into type of worm- annelides (leeches), nematodes (roundworms), cestodes (tapeworms), trematodes (flukes)). Stimulate TH-2 response, which is characterized by elevated IL-4 and IL-5, both of which stimulate eosinophila. Exception to nematode rule are *Isopora* and *Dientameoba fragilis*, both enteric protozoans which can cause eosinophilia.
  - *Schistosomiasis* (fluke): Most eosinophilia with acute systemic illness (“Katayama fever”) with initial infecion, especially with mansoni and japonicum.
  - *Toxocara*: nematode carried by cats and dogs, causes visceral larva migrans and nematode endophthalmitis. Humans are aberrant host. Causes small granulomatous liver lesions but can cause extensive hepatic necrosis. Granulomatous lesions may be seen in every organ. Dx; triad of hepatomegaly, eos, hyperglobulinemia. Liver bx rarely diagnostic. ELISA- limited utility, stool O&P useless usually.
  - *Trichinella*: pork nematode. Commonly causes eosinophilia with migratory phase of infxn
  - *Strongyloides*: Transient lung infxn, chronic infxn of gut, can have persistent autoinfection, and therefore infxn years after exposure. Hyperinfection syndrome-fever, PNA, GNR bacteremia, +/- meningitis.
  - *Tropical eosinophilia*: Pulmonary sx- asthma, wheezing, cough, fleeting pulm infiltrates, +/- LAN and hepatomeg. .3000/mm3 eos, elevated IgE, and antibodies to filarial antigens but NO filaria in blood. (“occult filariasis”) Exaggerated immune response to infeciton with human filaria. Most common where Wurchuria and Brugia are endemic (India, Southeast Asia). Responds to ethylcarbamazine
  - Others: Hookworm (ancylostoma and necator), Echinococcus, Gnathostomiasis, Fasciola, Clonorchis, Paragonimiasis, Cysticercosis

- **Malignancy** Eosinophilic leukemia (variant of M4 phenotype of AML), eos in 15% of Hodgkins (IL-5 secreted by Reed-Sternberg) and 5% of NHL (B Cell), Sezary syndrome, cervical tumors, large cell lung Ca, squamous cell of vagina, skin, penis, and nasopharynx, adenoCa’s, TCC’s
- **Adrenal Insufficiency** - Glucocorticoids suppress eos, so loss of endogenous glucocorticoids leads to eos proliferation.
- **Cholesterol emboli** - eosinophilia and eos in urine
- **Drugs** - Many drugs can cause eosinophilia, usually benign and resolve with withdrawal of the drug. Multiple mechanisms for causing eosinophilia and different organs affected by eos, depending on particular drug. Includes GM-CSF, IL-2, NSAIDS, PCN, Cephalosporins, TCN, ASA, BBlockers, Allopurinol phenytoin, Ranitidine. Contaminated tryptophan caused the eosinophilia-myalgia syndrome, which persisted after drug was stopped.
- **Allergic Reaction/Atopy** - Allergic rhinitis, nasal polyps, asthma, ABPA
- **Collagen Vascular Disease** Most prominently with Churg-Strauss-vasculitis, neuropathy, renal dysfunction, asthma
- **Idiopathic hypereosinophilic syndrome** Mod-severe eosinophilia with end organ involvement and no other diagnosis. More common in men, can progress to death. May involve multiple organs
- **HIV** Unknown etiology of eosinophilia. Can see eosinophilic folliculitis, hypereosinophilia.
- **Other Infections** Eosinophilia in 25% of pts with pulmonary cocci
- **Specific organ involvement**
  - Well’s syndrome (eos cellulitis),
  - Shulman’s syndrome (eos fasciitis)
  - Eosinophilic panniculitis
  - Kimura’s disease- angiolymphoid hyperplasia
  - Pulmonary- interstitial lung disease, hypersensitivity pneumonitis, Loeffler’s (pulm infiltrates w/eos due to helminthic infxn), many more
  - Eosinophilic gastroenteritis
  - Cardiac- hypersensitivity myocarditis, endomyocardial fibrosis

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