15- Atopic Dermatitis

Background:

- Form of eczema that is often the first presentation of the "**atopic triad**" **(Atopic Dermatitis, Asthma, & Allergic Rhinitis)**
  - Can occur simultaneously or in succession (the atopic march)
- 60% rule: **60% begin by age 1; 60% resolve by 12 y/o**

Pathogenesis:

- Due to several genetic and environmental factors
  - 1 parent atopic = >50% chance child will be atopic
  - Mutations in the **filaggrin** gene: **fil**ament **agg**regating prote**in** → natural moisturization factor
  - Deficient in several types of **ceramides**: sphingolipids ("mortar" that holds corneocytes ("bricks") together in stratum corneum)

PEARL: What type of inflammatory response is present in **acute** atopic derm vs **chronic** atopic derm? **Acute** atopic derm has overactive **Th2** w/ ↑ IL4, 5, 13 vs **chronic** atopic derm has **Th1** response w/ IFN-g and IL-12

PEARL: What are some of the major triggers for atopic dermatitis? Think **FADS**!

F: Fragrances (laundry detergents or perfume), fabrics (wool or polyester), food allergies (wheat, eggs, milk, peanuts)

A: Allergens (pet dander, dust mites)

D: dry environments, detergents

S: stress, smoking, sweating, soaps, showering (too long or too hot)

Clinical Presentation:

- **Infantile** (2 months – 2 yrs)
  - **Erythema** and **scale** on the **cheeks**, **scalp**, and **neck** along w/ **extensor arms** and **legs**
  - Very itchy and inflamed
  - Can develop exudative plaques w/ *Staph aureus* colonization
    - Up to 90% of atopic derm pts are colonized with *Staph aureus* b/c their skin has ↓ antimicrobial peptides (vs psoriatic plaques having ↑ antimicrobial peptides = less likely to get infected)
- **Childhood** (2 -12 yrs)
  - "The itch that rashes"
  - Antecubital fossa (**flexures**) becomes itchy; pt's tend to scratch leading to classic excoriated lesions and lichenified plaques
  - Acute flare: ↑ erythema, pruritus, vesicles, and oozing

PEARL: What are some other features of atopic dermatitis in children that can help your diagnosis? Eyes: **Dennie-Morgan lines & allergic shiners**; Face & Neck: **Pityriasis alba & hyperlinear neck folds**; Extremities: **hyperlinear palms**, keratosis pilaris

- **Adolescent**/**Adult** (12-60 yrs)
  - Similar presentation to adolescents w/ ↑ **hand eczema**
- **Senile** (60+ yrs)
  - Xerosis triggered by sweating or stress

Diagnosis:

- **Clinical Diagnosis** consisting of **three essential features: 1) pruritus, 2) eczematous rash, 3) chronic relapsing course**
  - Other less common important features include: early age of onset, xerosis, atopy
  - Associated features include: atypical vascular response (facial pallor), keratosis pilaris, pityriasis alba, hyperlinear palms, ichthyosis, periorbital changes (Dennie-Morgan lines), lichenification
- Allergen specific IgE tests:
  - **RAST Test** ("immunoassay"): detect antigen-specific IgE in blood to various foods, insect venoms, medicine (penicillin), environmental allergen (pollen or dust mites), & work allergens (latex)
  - Skin Tests (**Skin Prick** or **patch testing**): detect allergen-specific IgE that activates mast cells in skin → wheals or contact dermatitis respectively

Histology:

- Acute: **spongiosis**, perivascular lymphocytes and histiocytes w/ occasional eosinophils
- Subacute: ↓ **spongiosis** and ↑ **acanthosis**
- Chronic: ↓↓ **spongiosis, ↑↑ acanthosis** (mimicking psoriasiform DZ) dermal fibrosis, hyperkeratosis

Treatment:

- **Avoid Triggers** (FADS)
- **Moisturizing** skin daily w/ in few minutes of exiting shower (use bland emollients or petroleum)
- First try, **low-mid potency topical steroids** (e.g. fluocinolone, triamcinolone) or topical **Calcineurin** inhibitors (pimecrolimus or tacrolimus)
- Non-sedating **antihistamines** (loratidine) in morning then sedating antihistamines (diphenhydramine, hydroxyzine) at night
- Then systemic therapy if needed, narrow-band **UVB**, then **prednisone, cyclosporine, azathioprine**, mycophenolate mofetil, methotrexate, dupilumab

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