Dermatologic Manifestations of Allergy

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Skin Manifestations of Allergy

- Atopic dermatitis (atopic eczema, eczema)
- Contact dermatitis
- Angioedema and urticaria
- You WILL see these

Atopic Dermatitis (AD)

- Up to 85% develop symptoms before age 5
- Symptoms frequently present in early infancy
  - 45% before 6 months, 60% before age 1 year
- 30% develop asthma
- 35% develop allergic rhinitis

AD Epidemiology

- Prevalence
  - 10-20% Children, 1-3% Adults
  - Higher in industrialized nations
    - Higher in urban vs. rural regions
    - More common in higher social class

The Atopic March

- Atopic Dermatitis seems to be the “Entry Point” for the development of allergic disease
AD Prognosis

- 60% of AD children are symptom free by early adolescence
- 50% may recur in adulthood
- Predictors of persistent disease course:
  - Early onset, severe early disease, asthma and hay fever, and family history
- Evidence of food and inhalant allergy by age 2 also predicts severe disease

Illi, J Allergy Clin Immunol 2004; 113: 925-31

AD Clinical Diagnosis

- Essential Features (3 of 4 Required)
  - Pruritus
  - Facial and extensor eczema in infants and young children / Flexural eczema in older children and adults
  - Chronic or relapsing dermatitis
  - Personal or family history of atopic disease

AD Frequently Associated Features

- Xerosis
- Cutaneous infections
- Chelitis
- Non-specific dermatitis of hands and feet
- Elevated serum IgE
- Positive allergy skin tests
- Early age at onset

Other Possible Features of AD

- Ichthyosis
- Palmar Hyperlinearity
- Keratosis Pilaris

Other Possible Features of AD

- Pityriasis alba
- White dermatographism and delayed blanch response
- Anterior subcapsular cataracts, Keratoconus
Other Possible Features of AD
- Dennie-Morgan infra-orbital folds
- Orbital Darkening
- Facial erythema or pallor

3 Phases of Atopic Dermatitis
- Infantile Phase – exudative, erythematous papules and vesicles
  - Face, trunk, extensor surfaces
- Childhood Phase – lichenified papules and plaques
  - Hands, feet, wrists, ankles, antecubital, popliteal
- Adult Phase – dry, scaling, erythematous papules and plaques with large lichenified plaques
  - Flexural folds, face, neck, upper arms, back, dorsa of hands, feet, fingers, and toes

Diagnosis of AD is made through history and appearance / distribution of skin lesions!

Food and AD
- Food allergy induces skin rash in 40% of children with AD
- Can be diagnosed with IPDFT, elimination/challenge or in vitro testing
  - Most commonly – egg, milk, wheat, soy, and peanut
  - T-cells specific for foods have been cloned

Aeroallergens and AD
- Sensitization to aeroallergens correlates with severity of AD
- Inhalation challenge in sensitized individuals can exacerbate pruritus and skin lesions
- Proper “avoidance measures” in dust sensitive patients has led to improvement in AD
- Immunotherapy is not universally helpful
  - Recent study showed improved AD when dust allergy is treated with immunotherapy

Food and AD
- Double-Blind, Placebo Controlled Oral Food Challenges
  - Food allergens caused increased symptoms
  - Symptoms resolved when food was eliminated

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Laubscher, A, 2005; 59(suppl 78):53-60
Scalabrin, J Allergy Clin Immunol 1999; 104: 1273-79
Holm, Allergy 2001; 56: 152-58
Werfel, Allergy 2006; 61: 202-205
Aeroallergens and AD

- Atopy Patch Testing
  - Mostly used for research
  - Occlusive patch testing with aeroallergens elicits eczematoid reactions in 30-50% of AD patients
  - Allergic patients without AD have no reaction to this patch test

Auto-allergens and AD

- Controversial
- Sera from patients with severe AD may contain IgE antibodies directed against human proteins
  - Mostly intracellular proteins
  - Is AD an autoimmune disease?

Staphylococcus aureus and AD

- Increased colonies of *S. aureus* in 90% of AD skin lesions
- Improved response to therapy when anti-staph antibiotics are included
- Superantigen production is the likely mechanism

Management of AD

- Multi-pronged Approach
  - Skin Care
  - Identification and Elimination of Triggers
  - Anti-pruritus Treatment
  - Anti-inflammatory Treatment

Skin Care

- Want to maintain moist skin at all times
  - Soak in clean, warm water (bath, not shower)
  - Avoid soap at every bath
    - Use gentle non-drying soaps (Aveeno, Dove, Basis, Neutrogena) - minimal defatting and neutral pH
  - Avoid bath oils
  - Avoid scrub brushes and washcloths

Petroleum jelly, mineral oil, or Crisco can be used if xerosis is severe

Skin Care

- Pat dry after the bath
- While skin is still moist, apply an emollient (Aquaphor, Eucerin, Cetaphil, Neutrogena)
- Petroleum jelly, mineral oil, or Crisco can be used if xerosis is severe
More Skin Care

- When rash leads to open, oozing sores:
  - Frequent baths (4 per day) in clean, warm water
  - Add colloidal oatmeal to the bath water (3 tbsp)
- Avoid irritants!

Skin Irritants

- Soaps and detergents
  - Want minimal defatting activity and neutral pH
  - Wash clothes in gentle, liquid detergent and add extra rinse cycle
- Heat and perspiration
- Occlusive clothing
  - Loose fitting cotton, silk, and cotton blends are best
- Sunburn

Identification and Elimination of Triggers

- Identify potential allergens through history and skin testing or in vitro testing
- Foods are very important and proper elimination / rotation diets should be used
- Immunotherapy for AD has not been proven to be beneficial
  - Reserve for patients with clear seasonal exacerbations or other symptoms of allergic disease

Treat Pruritus

- Proper bathing and emollients may be enough
- Add antihistamine if needed
  - Cetirizine, loratadine, desloratadine, fexofenadine, diphenhydramine, hydroxyzine
- Try non-sedating in morning and sedating at night to help with sleep
- Topical Doxepin works well, but is sedating

Anti-Staphylococcal Medication

- Topical mupirocin (Bactroban) works well when *Staph* colonization is present (almost always)
  - Treat the nose, too!
- Watch for super-imposed HSV infection

Topical Corticosteroids

- Reduce inflammation and pruritus in acute and chronic AD
- Goal is to use the lowest strength possible to control symptoms
- Ointments are generally preferred over cream / gel
  - More occlusive and fewer additives
**Topical Corticosteroids**

- **Adverse Effects**
  - Thinning skin
  - Telangiectasias
  - Bruising
  - Hypopigmentation
  - Acne
  - Striae
  - Face and intertriginous areas are more susceptible to these events
    - Low Potency formulations only!

- **Calcineurin Inhibitors**
  - Tacrolimus (Protopic) and Pimecrolimus
  - Bind to intracellular immunophilins in T-cells
    - Inhibits calcineurin – a calcium-ion-calmodulin dependent protein phosphatase necessary for signal transduction
    - Cytokine gene transcription cannot occur

- **Prescribe Enough!**
  - BID dosing for most, QD for Fluticasone and Mometasone
  - 30g is needed to cover the entire body of an average adult
  - Instruct patients in the FTU (Finger Tip Unit)
    - Medication extends from tip to the first joint of the index finger
    - 1 FTU = Hand or groin, 2 FTU’s = face or foot, 3 FTU’s = arm, 6 FTU’s = leg, 14 FTU’s = trunk

- **Taper the Dose**
  - Start with a higher potency steroid for moderate to severe AD
  - When improved after 2 weeks or so – step down to a lower potency before stopping
  - If not tapered, AD flares can develop
  - Steroid therapy may be discontinued when inflammation has resolved
  - Continue hydration and emollients
  - Consider twice weekly steroid maintenance

- **Official Indications for Calcineurin Inhibitors**
  - Tacrolimus .03% BID -- Moderate to severe AD, over the age of 2, unresponsive to, or intolerant of, steroids
  - Tacrolimus .1% BID -- As above, over the age of 16
  - Pimecrolimus 1% BID -- Mild to Moderate AD, over the age of 2, unresponsive to steroids
  - Local burning sensation is common, but usually resolves in 3 days

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Boguniewicz, J Allergy Clin Immunol 2003; 112: S140-50
Van Der Meer, Br J Dermatol 1999; 140: 1114-1121
Black Box Warning on Calcineurin Inhibitors Threatened

- Post-marketing reports of malignancy in patients on calcineurin inhibitors
- Not higher than the general population
- Primate study with oral pimecrolimus demonstrated development of lymphoma
  - 30x the maximum recommended human dose
- 2005 ACAAI and AAAAI Calcineurin Inhibitor Task Force
  - Recommend no change in current usage patterns

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Other Therapies for AD

- Phototherapy – sunlight in small doses, UV-B and UV-A, and photochemotherapy with psoralen and UV-A (PUVA) for severe cases
- Systemic steroids – Avoid as much as possible (discontinuing usually associated with flares)
- Interferon Gamma – Downregulate Th2 function
- Cyclosporin – Systemic calcineurin inhibitor can improve symptoms, but side effects (renal impairment and HTN) limit its use

Other Therapies for AD

- Antimetabolites – Mycophenolate, Methotrexate, Azathioprine
- Psychological Treatment – Emotional stressors exacerbate disease
- Probiotics – 56 infants with mod-severe AD, randomized to lactobacillus or placebo – significant improvement in probiotic group after 8 weeks
- Tar Preparations – coal tar is anti-pruritic and anti-inflammatory, may induce folliculitis and photosensitivity, use restricted to chronic lesions

Atopic Dermatitis Treatment Algorithm - Summary

- Skin care / emollients
- Identification and avoidance of irritants / triggers
- Possible antihistamines / antibiotics
- If not enough, add low-potency steroid or calcineurin inhibitor
- Consider Dermatology evaluation

Contact Dermatitis

- Type IV hypersensitivity reaction
- Genetic contribution
- Initial sensitization occurs 10-14 days after antigen is picked up by Langerhan’s APC
- Reaction occurs 12-48 hours after subsequent exposure
- Th1 – pattern cytokine response

Are you itchy yet?
Contact Dermatitis - Triggers

- Plant oleoresin (ex. Poison ivy)
- Nickel and other metals
- Fragrances, nail polish
- Rubber, latex products
- Topical meds: hydrocortisone, Abx, benzocaine, benzaconium chloride

Contact Dermatitis - Features

- May be acute or chronic
- Intense, pruritic, papular erythematous rash with indistinct margins in contact area
- May be worse in areas of venous stasis
- History is critical in the diagnosis
- Patch testing may be done as well

Contact Dermatitis - Treatment

- Identification of offender & AVOIDANCE!
- Medium to strong potency topical steroids for limited duration
- Wet to dry compresses for oozing
- Calamine lotion, topical antihistamines
- Systemic steroids and antihistamines for more severe cases

Leaves of three …

… Leave them be!