Practice Gaps in Pediatric Dermatology

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DISCLOSURE

Relevant Financial Relationships
None

Off-Label Usage
Atopic derm: Antihistamines, oral antibiotics, bleach
Hemangiomas: all treatments discussed except propranolol

Other
I co-authored the AAD atopic derm guidelines
I am Derm Co-Chair of the National Eczema Association CUBE-C project
Learning Objectives

- Review the newest suggested management of atopic dermatitis and hemangiomas
- Discuss practice gaps that still exist
- Appreciate what is up-and-coming with eczema and hemangiomas
- Learn something
- Have fun!
Outline

- Brief review of disease
- Current dogma for management
- Guidelines you need to know about
- Practice Gaps
- Future state
Atopic Dermatitis
Atopic Dermatitis

- "Eczema"
- Atopic disease
- Inflammatory destruction of epidermis
- Predispose to infection and scarring
Atopic Dermatitis

- Very itchy!
  - “The itch that rashes”

- Worsened by:
  - Foods
  - Stress
  - Infection
  - Other atopic diseases
Atopic Dermatitis: Exam

- Weeping, crusted erythematous plaques with a serum crust
- Scratches
- Ulceration
- Dry skin
- Rough, lichenified skin
Atopic Dermatitis

**Treatment:**

- Maintain barrier function:
  - Emollients, Oils

- Prevent infection:
  - Antibiotics

- Relieve itching:
  - Antihistamines

- Decrease inflammation:
  - Topical steroids/immunomodulators

- Avoid irritants, allergens
AAD guidelines

- 4 sections, 2014 JAAD
- Planned renewal every 5 years
- SORT process: evidence based
- Practice gaps discussed and highlighted
ARS question

- What is the best serum test to monitor atopic dermatitis flares?
  - A. IgE
  - B. Eosinophil count
  - C. Dust mite antigen
  - D. Tissue transglutaminase
  - E. None
Practice Gap: Testing

- NONE needed
- No lab test is helpful or predictive over time
- Happy patient
- Happy family
- Cost containment
Practice Gap: Bathing

- Bathing is helpful
- Only additive known to be effective is bleach
- Bleach shown to decrease colonization of microbes
- Inexpensive
- Readily available
ARS question

What is the optimal application regimen for topical steroids in atopic dermatitis?

- A. once daily
- B. twice daily
- C. three times daily
- D. twice daily every other day
- E. twice daily for five days, then 2 days off
Practice Gap: Steroid application

- Once daily application is as effective as BID application
- No randomized trials found BID use superior!
- Increased compliance
- Increased safety
- Less expensive
Practice Gap: Antibiotics

- **Topical antibiotic use NOT recommended**
  - Mostly addressing colonization
  - Increased allergic contact risk
  - MRSA growth rates are decreased in AD patients

- **Systemic antibiotic use recommended only with proof of infection**
  - Clinical: pustules, warmth, foul exudate
  - Lab: culture swab with sensitivities
Practice Gap: Antihistamines

- Topical antihistamine use NOT recommended
  - Increased allergic contact risk
  - Low efficacy

- Systemic antihistamine use recommended only with allergic rhinoconjunctivitis
  - Does not alter disease course
  - Prolonged use alters school performance
Practice Gap: Prevention

- Sensitive skin care regimen should continue

- Consistent emollient application should continue

- Application of steroid to consistently affected areas two times a week between eruptions is okay (and perhaps preventative)
Practice Gap: Education

- Most atopic dermatology appointments are TOO SHORT
- Intense education of the patient and family is imperative
- Repetition important
- Realistic expectations should be set
Coalition United for Better Eczema Care (CUBE-C)

- 2017-2018
- National Eczema Association
- Multidisciplinary atopic dermatitis education module
- Focus on whole patient
- Advocate for best practices
- Influence quality metrics
Hemangiomas
ARS question

- The most rapid growth period for infantile hemangiomas is:
  - A. 0-1 month of age
  - B. 0-4 months of age
  - C. 3-6 months of age
  - D. 6-9 months of age
  - E. 9-12 months of age
Infantile Hemangioma

- Accessory arterial growth
- Standard maturation process
  - Pallor, bruise at birth
  - Reveals itself wk 2-4
  - Grows first few months
  - Stabilizes
  - Involutes

- Exam: red patch, plaque or nodule with reticulation

- Etiology unclear
  - Placental nidus?
  - Reactive response to low O2?
The Typical Hemangioma

- The definite majority
- "Nuisance" birthmark
  - Small
  - Hidden
  - Flat vs mildly raised
  - "Incidental" lump

- Standard life cycle
  - Appear, grow, stabilize, resorb

- Occasional treatment
  - Cosmesis
  - Fibrofatty residua, telangiectasias
The High-Risk Hemangioma

- The relative minority

- Characteristic locations
  - Near vital structures
    - eye, ear, nose, mouth, anogenital
  - On “busy” body parts
    - digits, anogenital, buttocks

- Large volume
  - Not necessarily surface area
  - Likely to ulcerate during growth phase
Why Intervene?

- Impaired organ function
  - Airway, vision, hearing, stooling

- Local destruction
  - Nose, ear, digit

- Ulceration
  - PAINFUL!, infection, scars

- Cosmesis
Practice Gap #1: Location, location, location!
PHACE syndrome

- Posterior fossa malformation
  - Esp Dandy Walker
- Hemangioma
  - Facial (beard area: airway!)
  - Segmental
- Arterial anomalies
  - Esp cerebral artery system
- Cardiac anomalies/Coarct
- Eye anomalies

- Cause unknown
- Heavy female predominance
- Can have delay in complications
PELVIS/SACRAL syndrome

- Perineal hemangioma
- External genitalia malformation
- Lipomyelomeningocele
- Vesicorenal abnormalities
- Imperforate anus
- Skin tag
- Spinal dysraphism
- Anogenital anomalies
- Cutaneous anomalies
- Renal/urologic anomalies
- Angioma of
- Lumbosacral location
Practice Gap #2: Ulceration
Which of the following is a recommended treatment for ulcerated hemangiomas?

- A. oral amoxicillin
- B. oral metronidazole
- C. pulsed dye laser
- D. topical steroids
- E. UVB phototherapy
General Principles for Ulceration

- General wound care
  - clean, moist, covered
- Topical lidocaine gel
- Topical metronidazole
Pulsed Dye Laser

**Therapeutic uses**
- Ulcerated tissue
  - Works very well!
  - Weekly, 1-3 visits
- Leaky blebs

**Optional uses**
- Flat hemangiomas
- Residual telangiectasia
Topical Becaplermin

- Recombinant PDGF
- FDA: for diabetic ulcers
- Apply qhs under occlusion

- Very effective for ulcerations

- Considerations:
  - Will leave a fibrinous scar
  - Use, safety in children not studied
  - Expensive
  - Black box warning (45 gm)
Practice Gap #3: Proactive prevention is better
Topical Timolol

- Small, flat hemangiomas
  - with potential for problems
  - for cosmesis
  - for worried parents

- Twice daily use
  - not FDA approved
  - cheap, easy

- Several weeks for results
Practice Gap #4: Current best practice when treatment is needed
Propranolol!

- The hero, the myth, the legend...

- Non-selective beta-blocker

- Found to shrink growing hemangiomas (and maybe even those past proliferation stage)

- Mech of action unknown:
  - Vasoconstriction
  - Decrease VEGF, bFGF
  - Induce apoptosis
  - Inhibit G protein pathway
  - Inhibit mesenchymal cell differentiation
Propranolol for Severe Hemangiomas of Infancy

TO THE EDITOR: Despite their self-limited course, infantile capillary hemangiomas can impair vital or sensory functions or cause disfigurement. Corticosteroids are the first line of treatment for problematic infantile capillary hemangiomas; other options include interferon alfa and vincristine. We have observed that propranolol can inhibit the growth of these hemangiomas. Our preliminary data from 11 children are summarized in Table 1 in the Supplementary Appendix, available with the full text of this letter at www.nejm.org.

The first child had a nasal capillary hemangioma. Despite corticosteroid treatment, the lesion was stabilized but obstructive hypertrophic nasal discharge developed, necessitating nasal intubation. The patient experienced periorbital and nasal orbital involvement, as well as an intracranial mass causing compression and tracheal and esophageal deviation (see the Supplementary Appendix). Ultrasonography showed increased cardiac output, and treatment with propranolol, at a dose of 2 mg per kilogram of body weight per day, was initiated. Seven days later, the child was able to open his eye spontaneously, and the mass near the parotid gland was considerably reduced in size. Prednisolone was discontinued at 4 months of age, without any regrowth of the hemangioma; at 9 months of age, the eye opening was satisfactory, and no major visual impairment was noted.

After written informed consent had been obtained from the parents, oral propranolol was initiated at a dose of 2 mg per kilogram per day for 1 month. The dose was then increased to 4 mg per kilogram per day for 1 month. The dose was then decreased to 2 mg per kilogram per day, and the patient has been followed up for 1 year without any further progression of the lesion. The patient is now 1 year old and has no further progression of the lesion.

Serendipity

Eleven patients

2mg/kg
Propranolol better than Steroids

- Meta-analysis of 40 articles, from 1965-2012

- Response rate of IH to steroids (2697 pts): 69% IL, 71% oral
- Response rate of IH to propranolol (799 pts): 97%

- Fewer side effects with propranolol also:
  - Steroids 17.6% vs Propranolol 13.7%
Consensus Conference on Propranolol

- NIAMS sponsored, 28 persons, 5 specialties
- Recs based on provider surveys and literature review

- EKG: if low HR, arrhythmia, Fam hx of arrhythmia, Maternal CTD
- ECHO: not routine

- In PHACE: at times, with Cardiology and Neurology; MRI

- Dosing: 1-3 mg/kg/d; TID dosing
- HR and BP: initial, 1-3 hours after dose, and with increases
- Glucose: not routine; take med with feeds; d/c if dec intake

- Hospitalize: <8wks, or if concerns
Learning more about hospitalization...

- Chart review of 31 patients, age 2wks to 21 months
  - No congenital heart defects or errors of metabolism

- 24 hour hospitalization

- 2mg/kg/day (TID), no escalation

- Monitored HR, BP, serum glucose

- No adverse events, HR initially decreased

- Frequent feeds instead of serum glucose monitoring

Rebound growth happens

- 212 IH pts given propranolol
- 6% had rebound
  - Tx 6mo, med til 15mo, visual proof
- All mixed or deep
- Most face, neck; most localized
- Avg time for rebound: 5.3 mo
- Avg age at rebound: 20.7 mo
- Responded to second course

Lessons Learned…

- Side effects do occur
  - Hypotension
  - Hypoglycemia
  - Bronchospasm
  - Neuro effects

- Need good relationship, competent parents

- Rebound growth after discontinuation

- Is there a better beta blocker?
Practice Gap #5: State of the Art summary
“State of the Art” Summary

- Review article on IH

- A great resource that discusses:
  - Current known incidence
  - Misuse of term “hemangioma”
  - Hypothesis of etiology: Placenta, hypoxia
  - Syndromes (PHACE, LUMBAR, SACRAL)
  - When and why to treat
  - Prednisone vs Propranolol
  - Other treatment modalities
  - Importance of multidisciplinary care

Conclusion

- Problematic hemangiomas and severe, refractory atopic dermatitis are common reasons to visit dermatology practices

- Both disorders can cause significant burden and medical problems for patients

- Treatment options are available

- New treatments are exciting

- Best practice guidelines exist for both disorders

- More knowledge is needed
Thank You