Recognition & Management of Allergic Skin Reactions in the Athlete
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Sports Dermatology

- Trauma
- Allergies
- Infections
Sports-Related Skin Allergies

- Contact Dermatitis
  - Irritant
  - Allergic
- Urticaria
- Exercise-Induced Anaphylaxis
Shin Guard Dermatitis Controversy

– Irritant versus Allergic?
Clinical Presentation of Contact Dermatitis by Type

<table>
<thead>
<tr>
<th></th>
<th>Allergic</th>
<th>Irritant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Focal</td>
<td>Diffuse</td>
</tr>
<tr>
<td>Demarcation</td>
<td>Sharp</td>
<td>Ill-defined</td>
</tr>
<tr>
<td>Morphology</td>
<td>Red and scaling +/- vesicles (tiny blisters)</td>
<td>Red and scaling (very rare to have vesicles)</td>
</tr>
</tbody>
</table>
## Sport Allergens

<table>
<thead>
<tr>
<th>Item</th>
<th>Location</th>
<th>Component</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helmets</td>
<td>Forehead scalp</td>
<td>Epoxy resins</td>
<td>Silicone</td>
</tr>
<tr>
<td>Tape</td>
<td>Focal</td>
<td>Formaldehyde resins</td>
<td>Acrylate tape</td>
</tr>
<tr>
<td>Sailing wishbone</td>
<td>Hands</td>
<td>Thiorams</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Analgesic cream</td>
<td>Focal</td>
<td>Eucalyptus</td>
<td>Hot/cold packs</td>
</tr>
<tr>
<td>Shin pads</td>
<td>Shins</td>
<td>Urea formaldehyde</td>
<td>Barrier between guard and skin</td>
</tr>
<tr>
<td>Maggots</td>
<td>Hands of fishers</td>
<td>Dyes</td>
<td>Non-dyed</td>
</tr>
</tbody>
</table>
### Allergens in Swimmers

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Goggles</td>
<td>Periorbital</td>
<td>Thioureas,</td>
<td>Airblown neoprene, polyvinyl chloride</td>
</tr>
<tr>
<td></td>
<td></td>
<td>benzoylperoxid</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>e</td>
<td></td>
</tr>
<tr>
<td>Brominated pools</td>
<td>Generalized</td>
<td>Bromine</td>
<td>Chlorine, fresh water</td>
</tr>
<tr>
<td>Wetsuit</td>
<td>Generalized</td>
<td>Thioureas,</td>
<td>Ethylene vinyl acetate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>nickel</td>
<td></td>
</tr>
<tr>
<td>Masks</td>
<td>Face</td>
<td>Mercaptobenzot</td>
<td>Silicone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hiazole</td>
<td></td>
</tr>
<tr>
<td>Swim caps</td>
<td>Scalp, forehead</td>
<td>Mercaptobenzot</td>
<td>Silicone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hiazole</td>
<td></td>
</tr>
</tbody>
</table>
Urticaria of Athletes

- Aquagenic
- Cholinergic
- Cold
- Dermatographism
- Plantar
- Solar
Epidemiology of Athletic Urticaria

• Overall
  Large European dermatology practice 2.4%
  Athletes in the study 14%

• Incidence by urticaria type in athletes (N=30)
  – Cold (N=14) 47%
  – Cholinergic (N=8) 26%
  – Dermatographism (N=5) 17%
  – Solar (N=2) 7%
  – Pressure (N=1) 3%

• Large prospective studies needed
Sport Specific Urticaria

- Aquagenic (swimmers)
- Cholinergic (runners principally prone)
- Cold (any outdoor winter sport/swimming)
- Dermatographism (rubbing against athletic equipment)
- Plantar (runners & basketball)
- Solar (any outdoor sport)
Cold Urticaria

- **Mechanisms of action**
  - **Idiopathic (essential)**
  - **Secondary (connective tissue disorders, cryoglobulins)**
  - **Key feature is the change in temperature - not absolute T**
Dermatographism

• Mechanisms of action
  – Rubbing the skin degranulates mast cells
    • Equipment, other competitors etc.

• Clinical presentation
  – Linear edematous, erythematous, well-defined plaques
  – Occur in the areas of trauma within seconds
  – Dissipate soon thereafter

• Diagnosis
  – Scratch test on the back
Solar Urticaria

- Mechanism of action
  - Induced by ultraviolet A, ultraviolet B, or visible light
## Tests for distinguishing the physical urticarias in athletes

<table>
<thead>
<tr>
<th></th>
<th>Rapid warming in sauna</th>
<th>Ice cube test</th>
<th>Focal warm water compress</th>
<th>Phototesting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquagenic pruritus</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Cholinergic urticaria</td>
<td>Positive</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Cold urticaria</td>
<td>Negative</td>
<td>Positive</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Aquagenic urticaria</td>
<td>Negative</td>
<td>Negative</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Solar urticaria</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative</td>
<td>Positive</td>
</tr>
</tbody>
</table>
EIA

• Nomenclature
  – Exercise-induced anaphylaxis
  – Exercise-induced angioedema
Which Athletes Develop EIA?

- 78% (284/365) induced by running
- Cyclists, downhill skiers, and basketball, handball, racquetball, and tennis players
Epidemiology

- Age range: 4-74 years
- Mean age: 25 years
- Female to male ratio: 2:1
- Symptoms develop between 5 minutes after beginning exercise to after stopping exercise
Critical history questions to ask the athlete with suspected EIA

<table>
<thead>
<tr>
<th>Question</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you experience EIA flares more frequently when you.....</td>
<td></td>
</tr>
<tr>
<td>1) exercise in very cold or very hot conditions?</td>
<td></td>
</tr>
<tr>
<td>2) eat certain foods before exercising?</td>
<td></td>
</tr>
<tr>
<td>3) take aspirin, ibuprofen (or other NSAIDS), or antibiotics before exercising?</td>
<td></td>
</tr>
</tbody>
</table>
## Differentiating EIA from cholinergic urticaria

<table>
<thead>
<tr>
<th>Disease</th>
<th>Athletes’ complaints</th>
<th>Physical exam</th>
</tr>
</thead>
</table>
| Cholinergic urticaria | Shortness of breath  
Skin rash                      | 1) Expiratory lung wheezes  
2) Small discrete red papules  
3) Appropriate blood pressure  
4) Appropriate heart rate |
| EIA             | Shortness of breath  
Skin rash  
Lightheaded  
Heart racing     | 1) Inspiratory stridor at larynx  
2) Large areas of angioedema  
3) Hypotension  
4) Tachycardia    |
References


• Shadick NA et al. The Natural History of EIA. J Allergy Clin Immunol 1999;104:123-7