Allergic Conditions in Sports

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Goals and Objectives

• Describe diagnosis and management of exercise-induced bronchospasm/bronchoconstriction (EIB)
• Describe diagnosis and management of allergic rhinitis (AR)
• Describe diagnosis and management of other allergic reactions in athletes
Exercise Induced Bronchospasm (EIB)

- Occurs in 10% of general population and 80-90% of those with underlying asthma
- Prevalence of 8 to 50% in athletes
- Transient, reversible bronchospasm triggered by a bout of exercise
- Takes 5 to 8 mins to induce EIB, peaks 5 to 10 mins after cessation of exercise, dissipates at 25-30 mins
Exercise Induced Bronchospasm (EIB)

• Seen in cold weather athletes (cross country skiers), endurance athletes, and swimmers

• Symptoms:
  – Wheezing, cough, SOB, chest tightness, poor performance, fatigue, “feeling out of shape”
  – Poor predictors of EIB as other etiologies have similar symptoms
Exercise Induced Bronchospasm (EIB)

• Suspected etiologies:
  – A) Vasodilation of airways occurs after exercise to warm the airways causing water loss and engorgement of airways...resulting in bronchoconstriction and release of inflammatory mediators
  – B) Environmental irritants...chlorine or other gases
Exercise Induced Bronchospasm (EIB)

• Diagnosis:
  – No accepted standard test for diagnosis of EIB
  – Obtain spirometry first to r/o underlying asthma
    • If present, treat underlying asthma first
  – Fall in FEV1 of 10% or more with appropriate challenge test
    • Pharmacologic...methacholine, histamine, saline
    • Exercise...stationary bicycle or treadmill
    • Eucapnic voluntary hyperventilation
      – Inspiration of mixture of cold, dry air
      – Recommended by the IOC
Exercise Induced Bronchospasm (EIB)

- **Treatment:**
  - **Nonpharmacologic**
    - Avoid known triggers
    - Choose sports with low minute ventilation
    - Pre-exercise warmup 45 to 60 mins prior to event...induces a relative refractory period
    - Dietary sodium restriction for 1-2 weeks
    - Dietary anti-inflammatories...omega-3 fish oil
  - **Pharmacologic** – mainstay of treatment for EIB
    - Control any underlying asthma first
Exercise Induced Bronchospasm (EIB)

- Inhaled Short Acting Beta2 Agonists (SABAs)
  - Albuterol, levalbuterol
  - First line treatment of EIB
  - Prohibited by IOC and WABA without therapeutic use exemption (TUE)
  - Inhaled 15 minutes prior to exercise
  - Used for more strenuous workouts or competitions...tachyphylaxis can develop
Exercise Induced Bronchospasm (EIB)

- Mast Cell Stabilizers
  - More effective than anti-cholinergics but not as effective as SABAs
- Inhaled Corticosteroids
  - Mainstay of treatment for underlying asthma
  - Limited data to treat EIB
- Leukotriene Receptor Antagonists
  - Effective for treatment of EIB...but not as much as SABAs
Allergic Rhinitis (AR)

• Allergens/irritants cause inflammation of nasal mucosa
• Symptoms:
  – Rhinorrhea, nasal congestion, sneezing, itching, fatigue, headache, malaise, sleep disturbance
• Thought to affect 10 to 30% of the population
• Symptoms of AR reported in up to 60% of athletes
  – 40% of endurance athletes report symptoms
Allergic Rhinitis (AR)

- Treatment:
  - Avoidance of any allergen/irritant exposure if possible...typically difficult to do
  - Avoidance of first generation anti-histamines (diphenhydramine) due to CNS effects...sedation, drowsiness, impaired cognition, slower reaction times, visual discrimination issues
Allergic Rhinitis (AR)

- Intranasal Corticosteroids
  - First-line agents for treatment of allergic rhinitis
  - Superior to antihistamines
  - Minimal systemic absorption with great topical efficacy
  - Take time to work so no immediate effect
  - Minimal side effect profile
  - No eligibility issues for athletes
Allergic Rhinitis (AR)

• Antihistamines:
  1. Topical Antihistamines (azelastine)
     • Equal efficacy to oral antihistamines
     • Great for as needed or intermittent use
     • Quick, effective, no sedation, minimal adverse effects
  2. Oral Antihistamines
     • Avoid first generation oral antihistamines
     • Second generation group is preferred
       – Loratadine, desloratadine, fexofenadine, cetirizine*
     • Preferred for those who can’t tolerate intranasal corticosteroids
Exercise-Induced Anaphylaxis (EIAn)

- Anaphylaxis that occurs with exercise
- 2-15% of anaphylactic reactions associated with exercise
- Typically occurs with vigorous exercise but can be brought on by lesser physical activity
- Rare...but can be fatal
- Variability in frequency of attacks
- Caused by release of mast cells and allergy-mediating eosinophils in response to triggers
Exercise-Induced Anaphylaxis (EIAn)

• Typically starts within first 30 mins of exercise and can last up to 3 hours
• Symptoms
  – Diffuse warmth, flushing, pruritis, fatigue, urticaria (10-15 mm in diameter)
• Cessation of exercise...immediate improvement/resolution
• If no cessation of exercise...angioedema, GI symptoms, hypotension/vascular collapse, death
Exercise-Induced Anaphylaxis (EIAn)

- Risk Factors:
  - Personal/family history of atopy
  - NSAIDs
  - High heat/humidity...or cold
  - Alcohol ingestion
  - High pollen levels
Food-Dependent Exercise-Induced Anaphylaxis (FDEIAn)

- Category of EIAn
- Symptoms occur when food allergen ingestion and exercise occur within a few hours of each other
- Must have both to incite symptoms
- Wheat and shrimp most common inciting foods...also see with nuts, eggs, milk
Urticaria ("Hives")

- 10-20% incidence in general population
- Pruritic, white or erythematous, blanchable cutaneous elevations
- Mast cell degranulation \(\rightarrow\) vasodilation \(\rightarrow\) fluid into superficial dermis
- Triggers:
  - Idiopathic, medications, allergens, foods, exercise
Urticaria (“Hives”)

• Cholinergic Urticaria
  – Caused by rapid elevation in body temp
  – Exercise, fever, anxiety, hot tubs
  – Flushing and pruritis
  – Can treat with antihistamines

• Cold Urticaria
  – Caused by rewarming from exposure to cold objects
  – Swelling and pruritis
  – Antihistamine prior to exercise
Urticaria ("Hives")

- **Solar Urticaria**
  - Caused by UV light exposure
  - Limit UV exposure
  - Can develop anaphylaxis if significant exposure

- **Pressure Urticaria**
  - Caused by direct pressure on skin (mouth guards, prolonged sitting, wearing a brace)
  - Localized hives, fever, malaise
  - Antihistamines, NSAIDs, corticosteroids for treatment
Exercise Induced Angioedema

- Immunologic reaction causing fluid accumulation in deeper dermis layers of skin and subcutaneous tissues
- Pain, burning, pruritis
- Favors lips, tongue, larynx, GI system...can be life-threatening

Thorough evaluation:
- Detailed history (precipitants, meds), labs, skin biopsy
- May require referral to allergist


References


Questions?