Asthma and Athletics

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Asthma and Athletics

Objectives
- Be able to identify the signs and symptoms of an asthma exacerbation or exercise-induced bronchospasm (EIB)
- Know the diagnostic procedures and management recommendations for EIB
- Know the potential complications and differential diagnosis for asthma/EIB
- Know the NATA recommendations for EIB
Asthma and Athletics

- Chronic asthma affects 8.9% of children and 7.2% of adults
- Exercise-Induced Bronchospasm
  - Acute, transient airway narrowing that occurs during and most often after exercise
  - 50-90% of individuals with chronic asthma
  - 10% of people with no known history of asthma or asthma
  - Effects 11-50% of athletes
  - Likely underdiagnosed in athletes with no known asthma history
    - "out of shape" and with vague symptoms

Exercise-Induced Bronchospasm

- Athletes at risk
  - High ventilation and endurance sports
  - Distance running (Cross country)
  - Basketball
  - Swimming
  - Soccer
  - Cross-country skiing

Exercise-Induced Bronchospasm

- Mild impairment to respiratory failure
- Symptoms
  - Chest tightness
  - Wheezing
  - Fatigue
  - Poor performance
  - Avoidance of activity
  - Symptoms only in specific environments

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**Exercise-Induced Bronchospasm**

- Respiratory distress
  - Persistent cough
  - Nasal flaring
  - Paradoxical abdominal movements
  - Respiratory rate greater than 25 breath per minute
  - Inability to speak in full sentences
  - Increase wheezing or chest tightness

**Exercise-Induced Bronchospasm**

- 80% of maximal predicted oxygen consumption for 5 to 8 minutes is required to generate bronchospasm
- Transient bronchodilation then EIB occurs
- Symptoms peak 5 to 10 minutes after exercises ceases
- Variable recovery times without bronchodilator therapy

**Exercise-Induced Bronchospasm**

- Difficult to diagnose clinically
- Screening history
  - 40% with history suggestive of EIB
  - 13% with EIB following objective testing
- Differential diagnosis
  - Cardiac arrhythmias
  - Cardiomyopathies
  - Gastroesophageal reflux
  - Vocal cord dysfunction
  - Cardiac or pulmonary shunts
Exercise-Induced Bronchospasm

- **Objective testing**
  - Spirometry before and after inhaled bronchodilator therapy
- **Bronchoprovocation testing**
  - Greater than or equal to 10% decrease in forced expiratory volume in 1 second (FEV₁), pretest and posttest
  - Eucapnic voluntary hyperventilation (EHN)
    - High specificity
    - Standardization between labs, portable, inexpensive

Pharmacologic Therapy

- Short-acting B-agonists 15-30 minutes before exercise
- Peak bronchodilation in 15 to 60 minutes; last up to 3 hours
- Inhaled corticosteroids for athletes with asthma and EIB
- Leukotriene modifiers
- Allergy medications

Nonpharmacologic therapy

- Adequate pre-exercise warm-up
- Refractory period that can last up to 2 hours but varies and is not consistent across populations
- Nose breathing and wearing a facemask
- Avoidance of triggers
Sideline Management

- For practices and games all athletic trainers should have (NATA recommendations):
  - Pulmonary function measuring devices (peak flow meter)
  - A rescue inhaler with a spacer (preferably with a mask)

Complications

- 7-Year study identified 61 asthma-related sports deaths
- 91% had known mild intermittent or persistent asthma
- Only 8% reported use of long-term control medications
- 2:1 ratio of white deaths to black deaths
- Male subjects predominated
- Most under age 20 with most prevalent group being between the ages of 10 and 14 years old
- 57% had fatal event while participating in organized sport (basketball, track)

Return to Play

- No athlete should return to play until lung function returns to baseline
- No consensus return-to-play protocol
Management of EIB in NCAA Programs

- 68% diagnosed EIB on symptoms alone
- 17% diagnosed EIB by use of objective testing
- 21% stated athletic departments have a specific written protocol
- 61% of athletic programs mandate a short-acting beta agonist available at all practices
- 59% of athletic programs mandate a short-acting beta agonist available at all games

Management of EIB in NCAA Programs

- 52% stated that criteria for return-to-play was based on subjective improvement
- 20% stated that athletes are permitted to return to play after a rescue bronchodilator is given
- 18% indicated that objective improvement in peak flow meter reading must be documented before athletes can return

Summary

- EIB is common in athletes and likely underdiagnosed
- High ventilation or endurance athletes have a higher incidence of EIB
- Objective testing is the best way to determine EIB
- Pharmacological and nonpharmacological treatment should be used
- Have a written protocol
- Have a short-acting beta-agonist, peak flow meter, and spacer (preferably with mask) available for all games and practices

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Thank you

References

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