Work-related asthma
Session 2105

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American Occupational Health Conference
May 2, 2010

NOTHING TO DISCLOSE

Asthma - Definition

Asthma management guidelines:

*Asthma is a common chronic disorder of the Airways that involves a complex interaction of airflow obstruction, bronchial hyperresponsiveness and an underlying inflammation. This interaction can be highly variable among patients and within patients over time*.  

Asthma in the workplace*

- Employees without asthma/rhinitis, never develop in working life
- Individuals with asthma/rhinitis entering the workplace
  - Working conditions/exposures worsen, improve, no effect
  - Employees who develop asthma/rhinitis during employment
  - Asthma onset attributable to working conditions/exposures
  - Onset unrelated to working conditions/exposures
  - Workplace factors may worsen, improve, no change


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Occupational asthma
Concurrent asthma
Work-exacerbated asthma

WEA or WAA (work-aggravated asthma)
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Occupational asthma
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Work-Related Asthma*
Definitions

- OA - New-onset asthma that was initiated by an exposure during work.
- WEA - Pre-existing or concurrent asthma made worse by the work environment –
  - Worsening of symptoms
  - Worsening of airway hyperresponsiveness
  - Increased medication requirements
  - Necessitates avoidance of activities or exposures that were previously tolerated


Defining work-related asthma
Issues and controversies

Mechanisms
- Specific sensitizers - IgE-mediated, other mediators
- Nonspecific increase in bronchial responsiveness
  - Irritant-induced asthma
  - Reactive Airways Dysfunction Syndrome
  - “Low dose RADS”

Defining work-related asthma
Issues and controversies

Data requirements – quantity and quality
Symptoms
Immunologic sensitization
Changes in airflow and/or NSBR
Specific inhalation challenge
Workplace exposures

*WEA is from 1/3 to 2/3 of all Work-Related Asthma. Henneberger, Curr Opin Allergy Clin Immunol 2007.
Defining work-related asthma
Issues and controversies

Data requirements
Dependent on purpose –
- Individual medical management
- Workplace health surveillance
- Public health reporting
- Compensation

NIOSH Surveillance Classification:
Work-Related Asthma

FIGURE 1. Decision logic and case classification scheme for work-related asthma

Case Identification

Work-related asthma
Public health surveillance and medical screening

Work-related asthma public health surveillance
What is it?
How do we do it?
What can we learn from it?

Work-related asthma medical screening/surveillance
What is it?
How do we do it?
What can we learn from it?

Case finding methods should be consistent
Data sources:
- Individual medical records (EMR)
- Reports from clinics, offices, laboratories
- Hospital discharge
- Pharmacy
- Death certificates
- Compensation or insurance records
- Physician reporting forms – compulsory/voluntary

Not necessarily comprehensive, representative

Effort and detail

Work-related asthma public health surveillance
Track disease, distribution, and determinants
Provide data to those who can institute primary prevention

Work-related asthma medical screening/surveillance
Monitoring parameters which reflect risk of health effect
Identify individuals at risk for clinical disease
Enable secondary preventive actions
### Work-related asthma
Public health surveillance and medical screening

**Work-related asthma public health surveillance**
- Track disease prevalence, distribution, and determinants
- Provide data to those who can institute primary prevention

**Reporting guidelines - simple**
- Case confirmation criteria - more detailed
- NOT the same as OA diagnosis
- Can lead to confusion

#### Table: Program Name, Country, Reporters, Most Common Agent(s) (1-3), Occupations at Highest Risk, Incidence per Million Workers

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Country</th>
<th>Reporters</th>
<th>Most Common Agent(s) (1-3)</th>
<th>Occupations at Highest Risk</th>
<th>Incidence per Million Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWORD</td>
<td>United Kingdom</td>
<td>Occupational and Respiratory Physicians</td>
<td>Isocyanates</td>
<td>Laboratory technicians, shoe workers, healthcare workers</td>
<td>N/A</td>
</tr>
<tr>
<td>SORDSA</td>
<td>South Africa</td>
<td>Pulmonologists, occupational medicine doctors and occupational health nurses</td>
<td>Latex, Isocyanates, Platinum salts</td>
<td>N/A</td>
<td>13.1</td>
</tr>
<tr>
<td>SHIELD Midland England</td>
<td>Physicians</td>
<td>Isocyanates</td>
<td>Spray painters, Electroplaters, Rubber and plastic workers, Bakery workers, Moulders</td>
<td>41-43</td>
<td></td>
</tr>
<tr>
<td>FROI Finland</td>
<td>Physicians</td>
<td>Animal epithelia, hairs or secretions, Flours, grains and fodders</td>
<td>Bakers, Painters and lacquerers (including spray painters)</td>
<td>174</td>
<td></td>
</tr>
<tr>
<td>N/A British Columbia</td>
<td>Respiratory and generalist Physicians</td>
<td>Isocyanates, Western Red Cedar</td>
<td>N/A</td>
<td>181</td>
<td></td>
</tr>
</tbody>
</table>

**Table adapted from:**


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### United States
Sentinel Surveillance (formerly SENSOR)

- Physician reporting and other sources – state-based
- Most common agents: diisocyanates for New Onset, dusts for Work Aggravated Asthma
- Misc. chemicals (cleaners, smoke)
- Indoor air: mix of chemicals (e.g. cleaners), mites, and molds
- Workplaces - schools, hospitals, offices

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### Work-related asthma
Public health surveillance and medical screening

**Work-related asthma medical screening/surveillance**
- Monitoring parameters which reflect risk of health effect
- Identify individuals at risk for clinical disease
- Enable secondary preventive actions

**But... Does medical screening work??**

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### Management and Prevention

**CHEST Supplement**

Diagnosis and Management of Work-Related Asthma

American College of Chest Physicians

Consensus Statement
Management and Prevention

Work-related asthma
Public health surveillance and medical screening

Work-related asthma medical screening/surveillance
Monitoring parameters which reflect risk of health effect
Identify individuals at risk for clinical disease
Enable secondary preventive actions

Data -

Symptoms
Skin prick and IgE testing are useful in detecting sensitization to many HMW and some LMW occupational asthma agents.

Immunologic sensitization

Changes in airflow and/or NSBR
Airflow changes detect some OA not found by symptoms, especially persistent symptoms.

Workplace exposures
Valid measurements assist the interpretation of health findings.

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Data -

Induced sputum?
Exhaled NO?

The role of these markers of inflammation in monitoring workers for OA remains to be clarified.

Lemiere, Curr Opin Allergy Clin Immunol 2007

Which symptoms indicate exposure to sensitizers?

Symptom Onset in the First 2 Years of Employment at a Wood Products Plant Using Diisocyanates: Some Observations Relevant to Occupational Medical Screening


Skin prick and IgE testing are useful in detecting sensitization to many HMW and some LMW occupational asthma agents.

Lemiere, Curr Opin Allergy Clin Immunol 2007

But which parameters should be monitored?

Nicholson et al. Evidence-based guidelines for OA. OEM 2005

Data -

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Data:
- Symptoms
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- Changes in airflow and/or NSBR
- Workplace exposures

A comprehensive baseline evaluation is useful if symptoms develop later.

To maximize effectiveness, programs should be comprehensive.