*Project SENSOR. News

Volume 16, No. 4 Fall 2005

Occupational Asthma - What's New

There have been two recent review articles on work-related asthma that have useful information on the diagnosis, treatment and management of this condition:

Mapp CE, Boscetto P, Maestrelli P, Fabbri LM. State of the Art: Occupational Asthma. Am J Respir Crit Care Med 2005; 172:280-305

Nicholson P, Cullinan P, Newman Taylor AJ, Burge PS. Evidence Based Guidelines for the Prevention, Identification, and Management of Occupational Asthma. Occup Environ Med 2005; 62:290-299.
(an editorial summarizing the BOHRF guidelines was published in Thorax 2005; 60:364-366)

The State of the Art article provides a good overall review with over 300 references. It provides a realistic approach to diagnosis acknowledging that specific bronchoprovocation antigen testing is not available. Table I from the State of the Art article summarizes the characteristics of the different types of occupational asthma.

The second article is an evidence based review of the medical literature on occupational asthma from 1966-2004. Two hundred twenty-three papers were selected for review from 2,500 papers identified during this time period. The purpose of this exercise was to assist the occupational enforcement agency in Great Britain to reduce the incidence of occupational asthma by 30%. Table II shows the principal recommendation from the guidelines. One significant difference in these guidelines from previous guidelines is that these guidelines concluded that a negative methacholine challenge test when a patient is still working or has been away from work for less than 24 hours has a low predictive power for excluding occupational asthma. This conclusion was criticized in an accompanying editorial which concluded a negative methacholine challenge test at the time of work or within 24 hours does have a high predictive value in excluding the diagnosis (Tarlo SM, Liss G. Commentary on Guidelines. Occup Environ Med 2005; 62:288-289).

Please call Kenneth Rosenman, MD if you have clinical issues you would like to discuss regarding patients who may have occupational asthma.

Table I. Characteristics of Main Forms of Work-Related Asthma

Characteristic	Immunologic OA (Sensitizer-induced)	Irritant-induced OA	Aggravation of Preexisting or Coincident Asthma
Asthmatic symptoms	Yes	Yes	Yes
Onset	During working life	Within 24 h of exposure to high levels of a respiratory irritant[a]	Before or during working life
Relation to work	Symptoms worsen during the working day, and may improve away from work	Reexposure to the same exposure conditions as occurred in the acute incident is not recommended; persistence of symptoms for at least 12 weeks	Symptoms worsen while at work
Other characteristics	Exposure to a known sensitizer	No previous diagnosis of asthma or other chronic lung diseases	Presence in the workplace of triggers of asthma, such as dusts, fumes, cold air, smoke, or exercise
Lung tests	Objective evidence of asthma[b]	Objective evidence of asthma[b]	Objective evidence of asthma[b]
Serial PEFR plus symptoms and medication diaries	Worse during periods of regular work than when off work	No changes unless the irritant is also a sensitizer	Worse during periods of regular work than when off work
Methacholine challenge	Airway hyperresponsiveness usually present; often worse at the end of a work week than at the end of a holiday period	Airway hyperresponsiveness usually present	Airway hyperresponsiveness usually present; no difference between work periods and when off work
Specific challenge	Positive response to the causal agent	Not feasible	—
Immunologic tests	Positive response to the sensitizer	—	—
Induced sputum test	Eosinophilia, ECP increase during periods of work exposure	Not investigated	Baseline eosinophilia, no further increase after exposure to a sensitizer at work
Assess exposure	Review MSDS[c] and patient's history to confirm exposure to a respiratory sensitizer in the workplace	Review patient's history to confirm temporal relationship between exposure to large quantities of a respiratory irritant and onset of asthma, usually requiring "medical attention"[d]	Review patient's history to confirm temporal relationship between exposure to dust, fumes, smoke, or exercise and respiratory symptoms

Definition of abbreviations: ECP = eosinophil cationic protein; MSDS = material safety data sheet; OA = occupational asthma; PEFR = peak expiratory flow rate. [a]There is still debate on the limit of 24 hours. [b]Airflow limitation with significant reversibility to bronchodilator (at least 12% increase in FEV_1); airway hyperresponsiveness to methacholine or histamine challenge. [c]Additional agents are reported each year and may not be listed in the MSDS. [d]"Medical attention," especially hospitalization, is not a necessary criterion. (Am J Resp Crit Care Med 2005;172:280-305)

Table II. Principal Recommendations

1	Employers, health and safety personnel, and health practitioners should be aware that at least 1 in 10 cases of new or recurrent asthma in adult life are attributable to occupation	A
2	Employers and their health and safety personnel should be aware of the very large number of agents known to cause occupational asthma and the risk of exposure to such agents	B
3	Employers and their health and safety personnel should be aware that the major determinant of risk for the development of occupational asthma is the level of exposure to its causes	B
4	Health practitioners should not use poorly discriminating factors—such as atopy, family or personal history of asthma, cigarette smoking, and HLA phenotype—which increase individual susceptibility to exposure as a reason to exclude individuals from employment	D
5	Employers should implement programmes to prevent (i.e. reduce the incidence) of occupational asthma by removing or reducing exposure to its causes through elimination or substitution and where this is not possible, by effective control of exposure	B
6	Employers and their health and safety personnel should ensure that when respiratory protective equipment is worn, the appropriate type is used and maintained, fit testing is performed and workers understand how to wear, remove and replace their respiratory protective equipment	D
7	Employers and their health and safety personnel should inform workers about any causes of occupational asthma in the workplace and the need to report any relevant symptoms as soon as they develop	D
8	Employers and their health and safety personnel should be aware that for most causes the risk of developing occupational asthma is greatest during the early years of exposure	C
9	Employers and their health and safety personnel should provide regular health surveillance to workers where a risk of occupational asthma is identified. Surveillance should include a respiratory questionnaire enquiring about work related upper and lower respiratory symptoms, with additional functional and immunological tests, where appropriate	C
10	Health practitioners should provide workers at risk of occupational asthma with health surveillance at least annually and more frequently in the first two years of exposure	C
11	Health practitioners should provide more frequent health surveillance to workers who develop rhinitis when working with agents known to cause occupational asthma and ensure that the workplace and working practices are investigated to identify potential causes and implement corrective actions	C
12	Health practitioners should provide more frequent health surveillance to any workers who have pre-existing asthma to detect any evidence of deterioration	*
13	Health practitioners should consider the use of skin prick or serological tests as part of the health surveillance of workers exposed to agents that cause IgE associated occupational asthma to assess the effectiveness of the control of exposure and the risk of occupational asthma among workers	*
14	Health practitioners should enquire of any adult patient with new, recurrent, or deteriorating symptoms of rhinitis or asthma about their job, the materials with which they work and whether their symptoms improve regularly when away from work	A
15	Employers and their health and safety personnel should assess exposure in the workplace and enquire of relevant symptoms among the workforce when any one employee develops confirmed occupational rhinitis or occupational asthma and identify opportunities to institute remedial measures to protect other workers	*
16	Health practitioners should be aware that the prognosis of occupational asthma is improved by early identification and early avoidance of further exposure to its cause	B
17	Health practitioners who suspect a worker of having occupational asthma should make an early referral to a physician with expertise in occupational asthma	*
18	Health practitioners who suspect a worker of having occupational asthma should arrange for workers to perform serial peak flow measurements at least four times a day	D
19	Physicians should confirm a diagnosis of occupational asthma supported by objective criteria (functional, immunological, or both) and not on the basis of a compatible history alone because of the potential implications for future employment	B
20	Employers and their health and safety personnel should ensure that measures are taken to ensure that workers diagnosed as having of occupational asthma avoid further exposure to its cause in the workplace	B
21	Physicians treating patients with occupational asthma should follow published clinical guidelines for the pharmacological management of patients with asthma in conjunction with recommendations to avoid exposure to the causative agent	*
22	Health practitioners should enquire about pre-existing occupational asthma to agents that job applicants might be exposed to in their new job and advise affected applicants that they are not fit to undertake this work	B

*No evidence, based on the clinical experience of the authors.

A-strongest evidence; high quality, consistent studies that are directly applicable

B-less strong evidence; well conducted, consistent studies, sometimes extrapolated from high quality studies that are not directly applicable

C-weaker studies; well conducted, consistent studies, sometimes extrapolated lower quality studies that are not directly applicable

D-Case reports and expert opinion

(Adapted from Nicholson et al, 2005)

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In this issue:

*PS *Remember to report all cases of occupational disease!*

Printed on recycled paper.

The Project SENSOR News is published quarterly by Michigan State University-College of Human Medicine with funding from the National Institute for Occupational Safety and Health and is available at no cost. Suggestions and comments are welcome.

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