

EDITORIALS

Consensus on work-related asthma

The recently published consensus statement on work-related asthma from the American College of Chest Physicians (ACCP) [1] [endorsed by the Occupational and Environmental Medical Association of Canada, the Canadian Thoracic Society (CTS) and the Canadian Society of Asthma, Allergy and Immunology and freely available on the website http://chestjournal.org/cgi/content/abstract/134/3_suppl/1S] is the latest in a number of recent statements addressing aspects of this topic. Given the previous statements, some readers may question the merits of yet another relating to this topic, and further ask why it is a consensus statement rather than an evidence-based guideline. As some of the authors of these guidelines, we feel it is important for clinicians to understand how this statement differs from others as it may help in deciding where the advice suggested can be of most help in clinical practice.

Work-related asthma contributes to a significant proportion of adult-onset asthma—occupational asthma (OA) has been estimated to be the most common chronic occupational disease in many countries [2] and work-exacerbated asthma (WEA) reportedly occurs in up to 25% of working asthmatics in primary care [3]. Nevertheless, the diagnosis is complicated and controversial; it will not be reached without a high index of suspicion and without asking questions about the temporal relationship of symptoms with work. Not surprisingly, work-related asthma is likely to be under-recognized: workers may be unaware that work exposures can contribute or cause asthma; they may not wish to admit to a work–asthma relationship (because of concern about losing their job). Finally, physicians may not question occupational exposures and differences in severity of asthma symptoms during working days versus weekends or holidays off-work [4].

The ACCP statement was developed by generating a specific series of questions, having methodological and content contributors, providing clear methods, seeking widespread feedback and providing easily translatable advice. Unlike previous statements, this document emphasizes both WEA (asthma that is not caused by the workplace but is worsened by workplace exposures) and OA (asthma caused by work, either secondary to a specific sensitizer or a high-level irritant exposure), detailing the advised approach to diagnosis and management. Another difference is the significant focus on prevention. The current statement expands the scope of previous North American OA statements, including a 1995 ACCP document [5] and 1998 CTS Guidelines [6], and provides an updated approach based on both evidence from literature review (where available) and consensus expert opinion (where evidence was limited).

The ACCP Work-Related Asthma group was initially charged with the responsibility of developing an evidence-based guideline (using the GRADE system), based on a systematic review of OA [7,8]. This report suggested high-quality evidence existed in only limited topics, e.g. conclusions on OA diagnosis were restricted to few areas for which sufficient evidence existed in the form of a comparison to a reference standard, specific occupational challenge tests (SICs). The panel recognized that SICs are performed in only a few centres and that patients who undergo these tests are not necessarily representative of all patients with suspected OA. The clinical indication for SIC when available (which can take ≥ 4 days to perform) is likely to be in cases where other tests were not performed or were inconclusive. Patients in whom the index of suspicion is high (e.g. painter, baker, red cedar lumber worker), who have a positive skin test response to a relevant work allergen and/or increased peak flow variability and/or increased methacholine responsiveness while working compared with off-work have a strong case for the diagnosis of work-related asthma and are unlikely to undergo SIC. This is especially the case in jurisdictions where SICs are not mandatory for diagnosis. Conversely, when SIC is performed only after having other preceding inconclusive tests, there can be questions as to the validity of comparing SIC results with these other tests. Due to the time, expense and limited availability of SIC, relatively few studies have been specifically designed to compare other diagnostic tests with SICs. Thus, the systematic review [7] could only draw evidence-based conclusions on the value of specific immunologic responses to a work allergen and of a single measure of airway responsiveness, such as a methacholine challenge (which reflects asthma, but not necessarily OA) in comparison with SIC. The report could not draw conclusions on the value of tests such as serial peak expiratory flow recordings, changes in measures of airway responsiveness and changes in induced sputum eosinophilia during periods at and off-work (tests which reflect asthma changes in relation to work). Further limitations of comparisons with this reference standard are that SICs can be falsely positive or negative [9] and are not of value in diagnosing irritant-induced OA or irritant-related exacerbations at work (except by excluding OA).

Similarly, the systematic review [7] considered that formal analyses of management options could not be performed. Randomized studies of removal, reduced exposure, or continued exposure to a work sensitizer in those with OA, are unlikely to be performed. Moreover, published cohort studies demonstrate heterogeneity

among reports regarding causative agents, asthma severity and duration of follow-up, precluding statistical comparisons. However, qualitative evidence synthesis did provide support for removal from exposure [7]—similar to recent British conclusions [10].

The ACCP panel thus developed a consensus statement based on the considered best available information from a broader medical literature including cohort studies and case series. A recent British Thoracic Society document similarly addressed Standards of Care for Occupational Asthma [11], following a Delphi document [12] and evidence-based review [13]; a Spanish Society of Pulmonology and Thoracic Surgery [14] document is also a clinical guide.

Not surprisingly, there are differences in the emphasis taken by the British, Spanish and North American documents. The ACCP document emphasizes need for consideration and management of WEA both initially in asthmatics and in those in whom the diagnosis of OA has been excluded—rather than only continuing with usual asthma management. Each recognizes the limitations of the reference standard SIC and the possibility of false-positive and false-negative responses. Differences in emphasis on uses of various diagnostic tests for OA among different statements from Europe and North America may reflect the lack of sufficient studies to determine diagnostic test characteristics compared with a reference standard. For example, the British Standards of Care document [11] supported use of a computerized interpretation system for records of serial peak expiratory flow readings. This has the potential advantage of providing an objective grade to the results and may be helpful for those physicians who do not frequently assess such patients. However, it has not been shown to be more reliable than 'eye-balling' plotted results by a physician with experience in interpreting such results (and the systematic review [7] did not express preference for one method of interpretation over the other). The British document put less emphasis than the ACCP document on serial methacholine challenges—comparing results during a working period to those during an off-work period. This test has support from numerous case reports and highly influenced estimates of OA probability from expert opinion among those reviewing a set of cases with serial investigations [15] but also has not been sufficiently quantified in relation to specific challenges. Finally, as an example perhaps reflecting availability in most North American versus British centres, skin testing for those occupational allergens for which a reliable extract is available was given more emphasis in the ACCP Statement than the comparable *in vitro* specific IgE assays. Differences in the investigation of OA may also be influenced by requirements of the different compensation systems. In Canada, the requirements of provincial Workers' Compensation Board certainly influence the investigation performed in each province, e.g. only the Quebec

compensation system requires SIC for OA diagnosis in the majority of cases.

The essential message of this document is that work-related asthma is common yet under-recognized, should be suspected in all adult asthmatics and carefully evaluated to allow accurate diagnosis, early management, and prevention of future cases among co-workers. Work-related asthma and the associated significant disability from this are potentially preventable in many cases with workplace measures and early intervention to reduce or eliminate the inciting agent. We hope that this latest consensus statement is a useful resource for clinicians.

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Conflicts of interest

The authors of this commentary are also co-authors of the Consensus Statement discussed in the manuscript.

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