Appendix B (on-line)

Workplace challenges

Methodology

Workplace challenges involve serial measurements of FEV_1 that are supervised by an technician before and throughout a work shift [1]. These challenges should also include a control day in the laboratory during which spirometry is monitored in the absence of occupational exposure. Preferably, serial measurements of spirometry should be performed on two consecutive work shifts [1] or during only one shift provided that the subject has been exposed to his/her workplace for the preceding 1-2 days under self-monitoring of PEF or FEV_1 using portable instruments. The level NSBHR and sputum eosionphil count can be assessed at baseline and at the end of the work shift.

Limitations

Although inhalation challenges at the workplace could be regarded as the "gold standard" for diagnosing OA, this approach suffers from practical limitations:

1. Authorization for performing the measurements should be obtained from the employer.

2. The tests should be carried out under the conditions of exposure that prevailed when the subject developed work-related asthma symptoms, which is often difficult to obtain in practice

3. These tests are much more expensive than SICs in the laboratory since a technician is required for a single test outside of the hospital

4. These tests may not allow for a precise identification of the causal agent when the subject is exposed to multiple sensitizers at work.

5. Concomitant exposure to irritants at the workplace cannot be controlled.

Indications

There is only scarce information on the validity of workplace challenges and their benefit as compared to SIC in the laboratory and unsupervised measurements of FEV_1/PEF during longer periods. Rioux and co-workers [1] reviewed the results of workplace challenges in 99 workers who showed a negative SIC with potential sensitizers. Twenty (22%) workers showed a positive response at the workplace. However, it should be outlined that the study involved a highly selected population. Thus, workplace challenges were performed if more than one potential sensitising agent was present at the workplace or if the worker's history was highly suggestive of OA using clinical criteria (i.e. major improvement or disappearance of asthmatic symptoms while away from work and reappearance on return to work) while SIC was negative in the laboratory. Inhalation challenges at workplace should be considered mainly in the following settings:

1. No agent known as causing OA has been identified at the subject's workplace.

2. The subject is exposed to multiple agents that are known as potential cause of OA, and performing SICs in the laboratory with each agent would be time-consuming.

3. The mode of exposure at work cannot be reliably reproduced in the laboratory, for instance complex industrial processes, welding, or mouldy environments.

4. SIC in the laboratory is negative while the clinical history is highly suggestive of OA and immunological tests failed to identify a suspected agent.

References

1. Rioux JP, Malo JL, L'Archeveque J, Rabhi K, Labrecque M. Workplace-specific challenges as a contribution to the diagnosis of occupational asthma. Eur Respir J. 2008;32:997-1003