CORRESPONDENCE

Whole-Body Plethysmography in Suspected Asthma—A Prospective Study of Its Added Diagnostic Value in 302 Patients

Prof. Dr. med. Antonius Schneider, Johannes Schwarzbach, Bernhard Faderl, Prof. Dr. med. Hubert Hautmann, and PD Dr. rer. nat. Rudolf A. Jörres in issue 24/2015

The Authors' Reasoning Is Impossible to Follow

The authors conducted in a methodologically well versed way a systematic prospective diagnostic study of the patients of a chest physician's practice—and found a much higher sensitivity for whole-body plethysmography compared with spirometry, whereas the specificity was slightly inferior (1).

However, I cannot understand the key message of the article—that “the added diagnostic value of whole-body plethysmography in suspected bronchial asthma was confirmed for routine clinical practice for the first time”—at all.

I need a diagnostic procedure with excellent sensitivity and at most satisfactory specificity merely for the purpose of ruling out a possible disease. This need does not exist in the case of bronchial asthma. Patients with a cough will not use their rapid-acting beta-agonist unless they are actually coughing—and for this reason, excluding a diagnosis of bronchial asthma is not required in the clinical setting.

Rather, what is needed is the confirmation of bronchial asthma as the relevant pathology—among other reasons, so that patients can be included in the asthma disease management program. Spirometry is rather more suited to confirming the diagnosis (the authors did not mention the variability of peak flow measurements taken by patients themselves). It is understandable that chest physicians want the whole-body plethysmograph—once purchased—to pay for itself.

I still cannot comprehend, however, how it would make sense to provide blanket coverage with these expensive devices throughout Germany.

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Conflict of interest statement

The author is a supporter of a primary care medical system. He receives €20 for every position documented in the DMP Asthma.

Added Value Is Still Unclear

The authors deserve thanks for attempting to profoundly evaluate a test system in retrospect. This test (whole-body plethysmography) is expensive and almost solely applied in Germany. (1).

Ignoring a quarter of the originally 400 patients, the authors showed that in the remaining 302 patients in a chest physician's practice, asthma was diagnosed more often by using whole-body plethysmography and bronchoprovocation testing than by using spirometry (79% versus 37%; sensitivity 95.2% versus 44.6%).

Compared with the simpler and less risky standard examination using spirometry and broncholysis, whole-body plethysmography was less precise (specificity 81.3% versus 91.7%).

The conclusion that general practitioners should therefore refer patients with normal spirometry results for additional whole-body plethysmography seems rather daring. This selection and referral system was not tested in the study, and neither do the results of the telephone survey show how relevant any benefit or harm as a result of the correct or incorrect diagnosis actually was.

In summary, the introductory question remains unanswered: the evidence for the diagnostic added value of whole-body plethysmography remains unclear.

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The author declares that no conflict of interest exists.

In Reply:

With regard to the comments by Dr Egidi, we wish to respond that ruling out a disease is at least equally as important as ruling it in by using the relevant diagnostic tools—something that is obviously true not only for bronchial asthma. Otherwise patients would be subjected to unwarranted treatment for too long or they would be labeled with a pseudo-diagnosis. In the setting of therapy ex juvantibus with inhaled sympathomimetic drugs it is not clear to which extent this treatment results in an iatrogenic fixation on the medication, whether as a placebo effect or, in similar circumstances, in the form of doping in competitive athletes. This is particularly important in view of the increased mortality risk associated with longer-term

use of sympathomimetics (1). Several studies have shown that measuring peak flow variability does not have any relevant diagnostic utility (2). For this reason, listing measurement of peak flow variability as an alternative diagnostic method in the guideline should be reconsidered.

With regard to the comments by Dr Popert, we wish to clarify that numerous diagnostic instruments are in use whose added diagnostic value in routine care has not been evaluated. We think this is problematic, not only in view of the scarce resources in the health care system, but also because of the risks to which patients are exposed. Evaluating the whole-body plethysmograph was of particular interest because the added diagnostic value (especially of the specific airway resistance sR_{AW}) during bronchoprovocation testing compared with spirometry (FEV_1) is not clear or is actually even in doubt (3). We wish to point out that the reaction of sR_{AW} was compared with that of FEV_1 during bronchoprovocation testing—and not with the “standard examination consisting of spirometry and broncholysis,” as claimed by Popert in his letter. Asthma can easily be ruled in by spirometry, but it cannot be ruled out (4). If dyspnea and/or coughing persist and the spirometry result is normal, then bronchoprovocation testing should be undertaken according to the guideline (1). Our study showed that bronchial asthma can be successfully ruled out by considering sR_{AW} with a negative predictive value (NPV) of 97.8%, which guarantees for high certainty. We did not ignore a quarter of the original sample of 400 patients, but our non-responder analysis showed that the NPV might have been overestimated. As the NPV is high, the assumption seems legitimate that we were able to

sufficiently explain the added diagnostic value—the confidence interval was narrow (94.5 to 99.1) (4). It was not possible to improve the positive predictive value (PPV=66.4%) as the specificity decreased. Patients with a positive result on bronchoprovocation testing should therefore be monitored regularly for whether long-term therapy should be continued or whether it could be stopped. We did not aim in our analysis to devalue the work done by primary care practitioners and enhance that done by pneumologists, but to assess the utility of a long established but never evaluated diagnostic method.

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