Reviewer's report

Title: Development of a questionnaire weighted scoring system to target diagnostic examinations for asthma in adults: a modelling study

Version: 1 Date: 20 September 2004

Reviewer: Raoul L Wolf

Reviewer’s report:

General

The authors note that a large number of individuals with potential asthma are identified by a general screening tool. In response, they have taken the approach of weighting the responses to determine which responders should have a complete medical examination to determine whether asthma is actually present.

To address this issue, they have taken a survey tool they previously excerpted from the European Community Respiratory Health Questionnaire. Based on a survey in 1995, which included a complete physical examination and the collection of objective criteria such as pulmonary function and allergy test, the authors mathematically derived a weighting system to identify subjects who were more likely to have asthma. The usefulness of this system was tested on a second retrospective cohort from 2001.

Overall, this is a well designed study that presents the aims clearly. The modeling approach is thorough and the use of a weighting system is well thought out. Such a system would be useful in detecting undiagnosed asthma in a practical way.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

While the statistical model that the authors use is clearly presented, there are several clinical points that should be clarified. These mostly relate to the design on the study. It is not clear from the current description how the third phase determined the validity of the initial questions and validated the weighting against a clinical standard.

How did the previous sophisticated modeling technique differ from the present score system, and was that system validated? It would be helpful if the authors provided a brief account of how this method relates to the present study.

This is a retrospective study, and is dependent on the questions in the original excerpted questionnaire. Were the methods used for the cohort from 1995 the same as were used for the 2001 cohort? It seems from the description that the second group was determined by a more sophisticated method and that the two are not comparable. This issue should be clarified. The significance of the weighting that was based on the 1995 group is tested on a second cohort, possibly derived by a more refined tool, so it is useful for the authors to address this issue.

It is surprising that criteria that are regarded as important in making the clinical diagnosis of asthma fared poorly in this study, for example night-time symptoms unrelated to respiratory tract infection. Did the patients respond differently when interviewed by a doctor? Did the physicians not regard nocturnal symptoms as significant in asthma? Age is given a high weighting, but would not be used clinically to diagnose asthma. Family history and allergic rhinitis have been shown to have a high association with asthma in epidemiologic studies, yet have low weighting in this study. The authors
should explain these disparities between the weighting in this screen and accepted clinical criteria for the clinical suspicion of asthma.

How frequently did physicians in the group disagree on the likelihood of obstructive lung disease and whether the disease was asthma or COPD? How frequently did they agree with the previous diagnosis? What was the error rate among the high probability and low probability groups? How did these errors affect the weighting?

The description of the use of a 50% cut-off is confusing. In the 1995 cohort physicians used three levels (<50%, 50 – 90%, or >90%), but in the 2001 group only 50% was used. It is not clear how >50% likelihood of obstructive lung disease translates into clinical practice. How many history or clinical signs are needed? Did each physician have the same concept? Were the parameters agreed on by the physicians and/or the researchers? What criteria were used by the physicians to distinguish COPD from asthma? Did all doctors use the same criteria for diagnosis of asthma as opposed to COPD?

The authors do not refer to other studies that have validated asthma screening tools and have taken an approach to stratifying responses according to validity. Others (e.g. Redline S et al Annals All Ast Immun: 2004; 93 36-48) have taken a rigorous approach to validating a questionnaire prospectively, using a panel of experts with firm criteria for levels of consideration of asthma. Some have used graded responses, rather than “yes” and “no”. It would be helpful for the authors to indicate how their approach differs from that taken by others.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:

None