A clinical prediction rule containing 6 variables accurately predicted hypersensitivity pneumonitis

Lacasse Y, Selman M, Costabel U, et al. **Clinical diagnosis of hypersensitivity pneumonitis.** Am J Respir Crit Care Med. 2003;168:952-8.

QUESTION

In patients presenting with a pulmonary syndrome, does a clinical prediction rule for hypersensitivity pneumonitis (HP) accurately predict which patients have HP?

DESIGN

2 cohort studies, 1 for derivation and 1 for validation.

SETTING

7 clinical sites in Canada, France, Germany, Spain, Finland, Japan, and Mexico.

PATIENTS

661 patients who were ≥ 18 years of age (mean age 55 y, 56% women), presented with a pulmonary syndrome that could be HP, did not have stage 1 sarcoidosis or a previous diagnosis of HP, and were not referred for therapeutic evaluation of a known interstitial disease. The derivation set had 400 patients, and the validation set contained 261 patients.

DESCRIPTION OF PREDICTION GUIDE

Logistic regression was used to compare the clinical characteristics of patients with and without HP for 18 variables.

MAIN OUTCOME MEASURE

Detection of HP. A diagnosis of HP was made on the basis of broncheoalveolar lavage lymphocytosis and bilateral ground-glass or poorly defined centrilobular nodular opacities on high-resolution computed tomography (HRCT). If these tests failed to yield a final diagnosis, then clinicians could use other procedures according to their usual practice. If a diagnosis was still not reached, then patients had a surgical lung biopsy. A committee (4 clinicians, 1 pathologist, and 1 radiologist) adjudicated the final diagnoses.

MAIN RESULTS

6 predictors of HP were identified: exposure to a known antigen, positive precipitating antibodies to the offending antigen, recurrent episodes of symptoms, inspiratory crackles on physical examination, symptoms occurring 4 to 8 hours after exposure, and weight loss (Table). For the derivation group, the area under the receiver-operating characteristic (ROC) curve was 0.93 (95% CI 0.90 to 0.95). The threshold showing the most appropriate tradeoff between sensitivity and specific was a probability for HP of 45% (sensitivity 86%, CI 79 to 92; specificity 86%, CI 81 to 90). Results for the validation group were similar (area under the ROC curve 0.90, CI 0.87 to 0.94). The observed proportion of patients with HP was similar to the predicted proportion in both the derivation and validation groups.

CONCLUSION

In patients presenting with a pulmonary syndrome, a clinical prediction rule containing 6 variables was accurate for predicting hypersensitivity pneumonitis.

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Significant predictors of hypersensitivity pneumonitis

Variables	Odds ratio (95% CI)
Exposure to a known antigen	38.8 (11.6 to 129.6)
Positive precipitating antibodies	5.3 (2.7 to 10.4)
Recurrent episodes of symptoms	3.3 (1.5 to 7.5)
Inspiratory crackles	4.5 (1.8 to 11.7)
Symptoms 4 to 8 h after exposure	7.2 (1.8 to 28.6)
Weight loss	2.0 (1.0 to 3.9)

COMMENTARY

Hypersensitivity pneumonitis, an uncommon interstitial disease related to a reaction to an inhaled allergen, can present in diverse ways. Accurate diagnosis is important for differentiating HP from other interstitial disorders because the prognosis and treatment may differ or different allergens may need to be avoided. No gold standard exists for the diagnosis of HP, and clinicians review many aspects of presentation and investigation to reach a diagnosis. Such assessments as HRCT or pathology viewed in isolation lack specificity to make a confident diagnosis.

In the large study by Lacasse and colleagues, a clinical prediction rule using 6 features had high specificity and sensitivity for the diagnosis of HP. This is useful because it may save patients costly, lengthy, and invasive investigations. The clinical features are easily obtainable, although with the precipitins assays may not be available locally, values may fluctuate, or precipitins may not be present (1) in some forms of HP. However, if the other measures, including exposure to a recognized antigen, are present, the probability of having HP still remains acceptably high.

The patients with HP in this study overwhelmingly had either farmer lung or bird fancier disease, the most common forms of HP. Not surprisingly, the most important predictor of HP was exposure to a known offending antigen, with an odds ratio of 38.8. However, > 300 causative agents have been identified, and the number continues to grow. Clearly, where a previously recognized offending agent is not present, a diagnosis of HP may only be considered after the pathologic characteristics or HRCT raises the possibility. In patients where a recognized antigen other than a common one is present, the usefulness of the clinical prediction rule remains to be tested.

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Reference

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