for both genders across all age groups. Furthermore, an inherent gender bias is unlikely to explain the results in a population with our age and height distribution. If anything, the gender bias seemed to be towards men, in that men had slightly lower per cent predicted LLN than women—except when we used the Quanjer equations, where women had the lowest per cent predicted LLN.

In conclusion, both the rerun of our main analyses with alternative reference values and the additional estimations of LLN by gender suggest that our results are unlikely to be dependent on the use of FEV₁ in per cent predicted. We agree with Miller and colleagues that LLN in per cent of predicted FEV₁ clearly declines with age, and that there may be a gender bias depending on the reference equations used. To avoid results that are dependent on a specific set of reference values, alternative reference values should be applied to test the robustness of the initial results.

Inga-Cecilie Sarheim,1,2 Anne Johannessen,3 Amund Gulsvik,2,4 Per S Bakke,2,4 Edwin K Silverman,1,5 Dawn L DeMee1,5
1 Channing Laboratory, Brigham and Women’s Hospital, Harvard Medical School, Boston, Massachusetts, USA; 2 Institute of Medicine, University of Bergen, Bergen, Norway; 3 Centre for Clinical Research, Haukeland University Hospital, Bergen, Norway; 4 Department of Thoracic Medicine, Haukeland University Hospital, Bergen, Norway; 5 Pulmonary and Critical Care Division, Brigham and Women’s Hospital, Harvard Medical School, Boston, Massachusetts, USA

Correspondence to Dawn L DeMee, M.D., M.P.H., Channing Laboratory, 181 Longwood Avenue, Boston, MA 02115, USA; dawn.demeo@channing.harvard.edu

Competing interests None.

Provenance and peer review Not commissioned; not externally peer reviewed.

Accepted 18 October 2010
Published Online First 20 November 2010

REFERENCES


Utility of cytopathology in diagnosis and molecular testing of lung cancer

We read with interest the editorial by Booton et al on advances in the treatment and diagnosis of non-small cell lung cancer. Recently published best practice guidelines for pathology recommend the provision of as precise a diagnosis as possible, with optimisation of specimen use.² We advocate the utility of cytopathology in this regard and share our experience of the diagnostic potential and the range of ancillary tests possible on respiratory-related cytology specimens.

During a 20-month period (1 September 2009 to 30 April 2011), 227 patients were diagnosed with lung cancer at our centre, 162 of whom (264 samples) had malignant cytology from a range of exfoliative (bronchial brushings, washings and lavages; pleural fluid) and fine needle aspiration samples, the latter encompassing transbronchial and transoesophageal ultrasound guided fine needle aspiration of mediastinal lymph nodes and lung. Patients had one to four samples each. Morphological diagnosis of keratinising squamous cell carcinoma could be made with confidence without the need for immunocytochemistry, and in experienced hands, cytological appearances of small cell carcinoma are also characteristic. Subtyping of other carcinomas was undertaken by means of immunocytochemistry performed on agar cell blocks, material permitting (table 1). A morphological diagnosis of keratinising squamous cell carcinoma not otherwise specified, due to insufficient material for immunotyping, may still be clinically useful depending on other clinical and staging information. If required, extra material can be requested for further subtyping.

Epidermal growth factor receptor mutation testing was requested in 36 cases, with mutations identified in six patients. Three tests failed due to insufficient DNA. In some cases where testing was not possible due to insufficient sample, direct communication with the treating clinician was undertaken to request more material, for example, pleural fluid. Testing for ALK- EML4 fusion was performed in one case.

The strategic use and triage of cytological material enable the maximum diagnostic and therapeutic information to be obtained. This may entail using all of the material in a sample for ancillary tests without producing traditional diagnostic slides, when the diagnosis has already been established in preceding samples. Close collaboration with