Communications to the Editor

Communications for this section will be published as space and priorities permit. The comments should not exceed 350 words in length, with a maximum of five references; one figure or table can be printed. Exceptions may occur under particular circumstances. Contributions may include comments on articles published in this periodical, or they may be reports of unique educational character. Specific permission to publish should be cited in a covering letter or appended as a postscript.

Diffusing Capacity Measurement in Patients with Airway Obstruction

To the Editor:

In the Pulmonary Function Laboratory at Beth Israel Hospital, for the past several years, we have routinely performed carbon monoxide diffusing capacity single breath testing with the Collins Apex 620 and Modular Lung Unit. This apparatus has used the ESP method6 for the timing of the test. The ESP method begins timing at half of inspiration, and the instant at which the anatomic dead space has been washed out and the expire is shifted into the gas collection system is considered the endpoint of timing. The classic Ogilvie method also stops timing at this point, but differs from the ESP in including all of inspiration time in the equation. The Jones-Meade method, devised to allow for delay in expiration, includes one-half expiration time plus ½ inspiration time.

We noticed that in patients with airway obstruction, especially asthmatics, the DCO timed by ESP in our lab was sometimes greater than our normal predictions. Based on this observation, we decided to determine how much the timing and the DCO calculations would differ by the three different methods. Ogilvie and Jones-Meade timings were obtained by use of a double stopwatch during ESP timed testing in randomly chosen patients who underwent pulmonary function studies. There were 62 trials on 28 patients, 16 of whom had airway obstruction.

The Ogilvie method yielded an average test time 0.5 sec greater than ESP time; this difference was rather uniform in all patients studied (standard deviation, 0.19 sec). Jones-Meade timing was, on the average, 0.80 seconds greater than ESP time; however, there was marked variability in different patients (standard deviation, 0.70 sec). The patients with airway obstruction had larger differences between Jones-Meade and ESP times; indeed, the Pearson correlation between this difference and an index of small airway obstruction, FEF25, was 0.403.

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Seven of our patients had ESP-calculated DCOs 20 percent or more over predicted values. Five of the seven patients had significant airway obstruction—asthma and/or COPD. In four of the patients with airway obstruction, Jones-Meade calculations led to significantly lower or normal DCO values. Two other asthmatic patients with normal spirometry at this time also had greater-than-predicted DCOs. Only one of these two asthmatic subjects had increased Jones-Meade timing and, therefore, appreciable drop in DCO calculations.

In conclusion, delay in expiratory timing seems to account for part but not all of the apparently falsely elevated DCO in some patients with airway obstruction, especially asthmatic patients. This is because, with slowness of expiration, diffusion continues during expiratory time. Ideally, calculations should be done by the three-equation method which analyzes inspiration, breath-holding, and expiration separately. This method, however, is not practical. We recommend the Jones-Meade method.

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REFERENCES

1 ESP: Epidemiology Standardization Project. Am Rev Respir Dis 1978; 118:1

Selection Bias

To the Editor:

In their recent article “Radiotherapy Alone for Patients with Operable Carcinoma of the Lung,” Cooper et al are unable to provide a meaningful comparison of surgery vs radiotherapy in the treatment of bronchogenic carcinoma. Obviously, a randomized comparison of these two therapies cannot be undertaken since complete resection, when possible, is the uncontested treatment of choice. However, the inability to perform such an ideal experiment should not lead one to settle for invalid comparisons. In the study by Cooper et al, the radiotherapy group was sicker than the surgery group by virtue of the disease which made them inoperable. It would not be unexpected to find that patients with impaired pulmonary or cardiovascular status or other coexisting disease were less able to withstand lung cancer and experienced a higher mortality rate than a group of healthier patients with similar cancers. Because of this selection bias, this study provides no real information on the relative efficacy of surgery and radiotherapy. There is no easy solution to the problem of trying to compare groups whose baseline characteristics are markedly different, but one should not draw conclusions from biased comparisons.

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