LETTERS TO THE EDITOR

PEF versus FEV1

The assertion by Dr Thiadens and colleagues1 that identification of airflow limitation and estimation of its reversibility by a bronchodilator is less reliable when measured by peak expiratory flow (PEF) than by forced expiratory volume in one second (FEV1) cannot be allowed to go unchallenged. They measured both values with a Microlab 3300 turbine spirometer, disregarding the fact that, in primary care, PEF is almost always measured by peak flow meters of variable orifice type which employ an entirely different principle and give considerably higher values. Jones and Mullee,2 who compared a similar Microlab turbine spirometer with a micromanometer, found that values of PEF measured by the latter were, on average, 87 l/min higher. Hence, the values reported by Thiadens et al would have been much higher if they had been measured with a peak flow meter.

To compare the reliability of PEF and FEV1 for estimating magnitude of airflow limitation, Thiadens et al expressed observed values of each as percentage predicted, using the reference values for each sex recommended by the European Respiratory Society (ERS).3 Those for predicting PEF were derived from regression equations which describe a linear fall with age and give predicted values much lower than curvilinear regressions such as those of Nunn and Gregg,4 which an ERS Working Party on PEF5 subsequently judged to be the most satisfactory reference values for prediction. The difference in l/min between predicted values derived from the latter and those from the ERS regressions was roughly equal in each sex (fig 1) to the difference between the two regression equations and the observed values and the values which would have been obtained with a peak flow meter. Since they are of opposite direction, they obscure the spurious low absolute values measured by the turbine spirometer. Nevertheless, Thiadens et al considered that, in 19.2% of their patients, low absolute values of PEF were associated with an abnormally low value of FEV1, whereas in only 3.3% of patients was a normal value of PEF associated with a normal value of FEV1 associated with an abnormally low value of FEV1.6

To evaluate the relative merits of FEV1, relative to PEF as indices of bronchodilator reversibility Thiadens et al compared changes in FEV1, expressed as percentage differences in predicted values, with changes in PEF expressed as percentage differences in absolute values. The dissimilar manner in which the values were expressed invalidates their comparison and, hence, any conclusions drawn from it; it also undermines the authors' prior discussion of the sensitivity and specificity of their findings wholly irrelevant.

There is no justification for stating that a cut off value for a rise in FEV1, after a bronchodilator is “useful and valid in separating asthma from COPD” since a bronchodilator reveals only immediate reversibility. Moreover, true reversibility does not necessarily signify COPD since it may be present in patients with longstanding asthma in whom structural damage of the bronchi has occurred. The most convenient and reliable test in primary care for distinguishing between potentially reversible and truly irreversible airflow limitation is still twi- or thrice daily monitoring of PEF during a course of corticosteroid treatment.7

The conclusion by Thiadens et al that FEV1 is more reliable than PEF for assessment of airflow limitation and its reversibility is not supported by their findings. Although I am very reluctant to criticise their study, attention needs to be drawn to its faults because the prominence given to their study is likely to persuade general practitioners that its findings are valid and its conclusions are authoritative.

IAN GREGG

Eynsham, Winney, Oxford, UK


AUTHORS’ REPLY

Dr Gregg’s remarks on our paper concern four major points: (1) the differences between the Micro medical spirometer and the mini-Wright peak flow meter; (2) the choice of predicted values; (3) the “dissimilar manner” in which changes in PEF were compared with changes in FEV1; and (4) the use of changes in the FEV1/PEF ratio.

(1) It is true that there are differences between the two devices based upon the different principles—turbine flow measurement and variable orifice peak flow measurement. As we stated in the discussion part of the paper, the turbine flow meter yields slightly lower values than a pneumotachograph8 and the variable orifice peak flow meter yields significantly higher values (200–300 l/min) than a pneumotachograph in the mid region.1 In both cases the pneumotachograph value is considered the reference value. Without pertaining to the brand of the portable spirometer used, it appears that the turbine values generally meet the criteria for monitoring peak flow ATS.9 In any case, the differences between the devices are systemic and should not interfere with the results of the study, provided that the same device is used throughout it.

(2) In the discussion this issue has also been questioned. The choice of the predicted values depends in part on the equipment used. The ERS predicted values for PEF are obtained from a mixture of pneumotachograph and mini-Wright peak flow data whereas the values proposed by Dr Gregg are obtained from mini-Wright peak flow meters. The values produced by the turbine spirometer come closest to the pneumotachograph values. In this paper, the ERS values are probably the best choice.

(3) This issue was referred to in the discussion of our paper. We did not only compare the changes in FEV1, expressed as percentage differences of predicted values, but also changes in PEF expressed as percentage differences in absolute values); we also compared changes in FEV1, as percentages of the initial values (including absolute improvement of 200 ml) with changes in PEF, both in absolute and percentage, to the initial values (see table 3). We agree that measuring longitudinal reversibility with a corticosteroid is the best method, although we prefer to use the FEV1 value at the start and the FEV1, after some weeks of corticosteroid treatment as outcome parameters. This issue was also discussed in the editorial by Professor Jones.

(4) Generally, the PEV1/FCV ratio is a reliable indicator of bronchial obstruction provided the manoeuvre is carried out correctly. This is a problem with hand held spirometers, and the recommendations are that the expiratory curve be followed in real time to ensure that a true beginning and end of the forced expiration is detected. This is not possible with hand held spirometers and inevitably leads to falsely low FEV1 values. In our opinion, therefore, it is wise to exclude this parameter from analysis.

Although Dr Gregg is very definitive in his opinion about the value of peak flow measurements, especially used in addition to the mini-Wright meter, he has not been able to convince us, nor has he referred to validity studies about the accuracy of this device in demonstrating (reversible) airflow limitation.

D S POSTMA

THI W VAN DER MARK

Department of Pulmonary Diseases,
University of Groningen,
The Netherlands

H A THIADENS

Department of General Practice,
Leiden University Medical Center,
2300 CB Leiden,
The Netherlands

Correspondence to: Dr H A Thiadens


Differentiation between mitral stenosis and coexisting PPH

I read with great interest the case report by Langleben et al of a woman with coexisting mitral stenosis and primary pulmonary hypertension (PPH) or plexogenic pulmonary arteriopathy who succumbed to operation for relief of her mitral stenosis. The failure of the patient’s pulmonary hypertension to decrease postoperatively led to her fatal outcome because the coexisting primary pulmonary hypertension was not recognised preoperatively.

I would like to call attention to the fact that the diagnosis should have been suspected preoperatively because her pulmonary artery wedge pressure was only modestly raised (16 mm Hg; normal = 12) and her pulmonary vascular resistance was extremely high (182 dynes s/cm²; normal = 67 (30)). In the presence of severe mitral stenosis the pulmonary artery wedge pressure, which reflects the left atrial pressure, is usually substantially increased whereas in the pulmonary vascular resistance is usually normal or mildly raised in the presence of a “reactive” as well as “passive” pulmonary hypertension. On the other hand, in primary pulmonary hypertension the pulmonary artery wedge pressure is usually normal and the calculated pulmonary vascular resistance is extremely high.

Case reports like that of Langleben et al illustrate the importance of careful analysis of the haemodynamic data obtained at catheterisation “in order to identify plexogenic pulmonary arteriopathy (or primary pulmonary hypertension) obscured by or masquerading as other disorders” such as mitral stenosis.

AUTHORS’ REPLY Dr Cheng’s analysis of the haemodynamic data obtained at cardiac catheterisation “in order to identify plexogenic pulmonary arteriopathy (or primary pulmonary hypertension) obscured by or masquerading as other disorders” such as mitral stenosis.


AUTHORS’ REPLY Professor Chang and Drs Shannon and Masters make important points that widen the issue to remind us all that there are other sectors of society who need special attention. My personal view is that the problems that affect asthma care delivery are the same throughout the world; it is only the magnitude of the individual problems that vary from country to country.

MARTYN R PARTRIDGE
The Chest Clinic, Whipps Cross Hospital, London E11 1NR, UK
e-mail: mrp@whipchic.demon.co.uk

Intravenous montelukast in acute asthma: expensive aminophylline?

We read with interest the recent paper by Doekhorne et al comparing the effects of single doses of intravenous and oral montelukast on forced expiratory volume in one second (FEV₁) in patients with chronic persistent asthma. We agree with the accompanying editorial, that a study of montelukast in acute severe asthma is now warranted. Indeed, few
published studies have examined the use of leukotriene receptor antagonists in patients with severe persistent asthma. 1

There are several good reasons why an intravenous leukotriene receptor antagonist might be effective in acute severe asthma, including evidence that high dose oral steroids do not affect leukotriene synthesis in vivo, 2 and that induced sputum cysteinyl leukotriene concentrations are significantly higher in subjects with acute severe asthma than in patients with milder asthma and normal controls which suggests that leukotrienes may be more functionally important in patients with acute severe asthma. 3

The question that most clinicians wish to answer is whether adding an intravenous leukotriene receptor antagonist will produce further improvements in patients with acute severe asthma who have already received conventional first line treatment including nebulised high dose salbutamol, ipratropium bromide, and systemic corticosteroids. 4 In other words, is an intravenous leukotriene receptor antagonist any better as second line intravenous treatment than aminophylline or salbutamol? The results of such studies are awaited with keen interest. It is behoven upon the pharmaceutical industry to sponsor such studies, asking clinically relevant questions regarding the value of leukotriene receptor antagonists as second line intravenous treatment.

OWEN J DEMPSEY  BRIAN J LIPWORTH
Asthma & Allergy Research Group, Department of Clinical Pharmacology & Therapeutics, Ninewells Hospital and Medical School, University of Dundee, Dundee DD1 7SY, UK
email: b.j.lipworth@dundee.ac.uk

Conflict of interests: The Asthma & Allergy Research Group have received funding and educational support from the following companies: Astra-Zeneca, GlaxoWellcome, Aventis, Merck, and Schering-Plough. Astra-Zeneca, and Schering-Plough. Joint Tuberculosis Committee of the British Thoracic Society. Multidrug resistance (to isoniazid and rifampicin) is another matter. However, data from the UK reference laboratory reporting system for tuberculosis (Mycobnet) give reason to pause. Of 93 isolates of multidrug resistant bacteria for 1997–8, 23 were also resistant to ethambutol, eight to pyrazinamide, and 15 to both. Thus, a four drug regimen for all these patients would either have been ineffective or would have led to further resistance developing in about half of the patients. Data for 1995 (which notifies about 200 cases each year) indicate that isolates from all seven cases of multidrug resistant tuberculosis identified in 1993–8 were resistant to at least one other drug. In view of these results, it seems better to concentrate on obtaining bacteriological proof of resistance whenever possible, the use of more rapid methods for detecting resistance, and even withholding treatment in well non-infectious patients until sensitivity tests are available. A wholesale move to a four drug regimen will increase side effects, decrease compliance, and may not do much to counter the problem of multidrug resistance.

J B COOKSON  M D L MORGAN  I D PAVOR
AJ WARDLAW  P BRADDING
Glenfield Hospital, Leicester, LE3 9QP, UK

AUTHORS' REPLY Dr Cookson and colleagues question the recommendation to move to a four drug initial phase regimen for patients in the 1998 guidelines on the management of tuberculosis. 4 A four drug initial phase regimen has been advised in the UK since 1990, with the omission of ethambutol from the initial phase in those at low risk of isoniazid resistance. 5 The 1998 recommendations were made with the knowledge of the drug resistance rates and epidemiology from Mycobnet, both published in an unpublished report.

These data show that drug resistance is not confined to London but occurs in many geographical areas, with significant rates of isoniazid resistance in defined groups—that is, those with a history of prior treatment (irrespective of ethnic group), in ethnic minority groups, and in those who are HIV positive (irrespective of ethnic group). The scientific and evidence base for short course chemotherapy was set out in detail in the recommendations 1 in the section immediately preceding the detailed treatment recommendations commented on by Cookson et al. These recommendations were controlled trials largely with a four drug initial regimen, although giving evidence that a three drug initial phase is satisfactory in those at low risk of isoniazid resistance. 6 The 1998 recommendations were made with the knowledge of the drug resistance rates and epidemiology from Mycobnet, both published in an unpublished report.

The current recommendation is to cater for the significantly more common isoniazid resistance in defined groups—that is, those with a history of prior treatment (irrespective of ethnic group), in ethnic minority groups, and in those who are HIV positive (irrespective of ethnic group). The scientific and evidence base for short course chemotherapy was set out in detail in the recommendations in the section immediately preceding the detailed treatment recommendations commented on by Cookson et al. These recommendations were controlled trials largely with a four drug initial regimen, although giving evidence that a three drug initial phase is satisfactory in those at low risk of isoniazid resistance. 6 The 1998 recommendations were made with the knowledge of the drug resistance rates and epidemiology from Mycobnet, both published in an unpublished report.

The safety and evidence base for short course chemotherapy was outlined in detail in the recommendations in the section immediately preceding the detailed treatment recommendations commented on by Cookson et al. These recommendations were controlled trials largely with a four drug initial regimen, although giving evidence that a three drug initial phase is satisfactory in those at low risk of isoniazid resistance. The 1999 guidelines on the management of tuberculosis. 7 A four drug initial phase regimen has been advised in the UK since 1990, with the omission of ethambutol from the initial phase in those at low risk of isoniazid resistance. 8 The 1998 recommendations were made with the knowledge of the drug resistance rates and epidemiology from Mycobnet, both published in an unpublished report.

The current recommendation is to cater for the significantly more common isoniazid resistance in defined groups—that is, those with a history of prior treatment (irrespective of ethnic group), in ethnic minority groups, and in those who are HIV positive (irrespective of ethnic group).
found more often, for instance in 3–10% of untreated patients, a fourth drug, usually ethambutol but sometimes streptomycin, is added”. There is also no evidence from published national audit studies or from programmatic data to support the statement by Cookson et al that a four drug regimen will “increase side effects or decrease compliance”.

The recommendations make explicit the need for bacteriological confirmation and hence drug susceptibility whenever possible, and the need to be aware of rifampin resistance and the use of molecular methods for detecting its presence. In this path, the recommendations meet the comments of Dr Cookson and colleagues.

PETER ORMERO
Department of Respiratory Medicine, Blackburn Royal Infirmary
Chairman, Joint Tuberculosis Committee

IAN CAMPBELL
Llandough Hospital
Secretary, Joint Tuberculosis Committee


BOOK REVIEWS


In 1955 the first edition of Donald Hunter’s book Diseases of Occupations was published. He said that he wanted to emphasise the clinical aspects of occupational disease and this remains true in the ninth edition of “Hunter’s”. The five main editors of this edition and the majority of contributors are UK based. However, given that its primary focus is clinical information, its contents ought to be valid worldwide. Clearly, for issues relating to country-specific health legislation, you may need to look elsewhere (although UK readers are catered for reasonably well).

The 1001 pages of this edition of Hunter’s are divided into 11 chapters (parts) with each part being divided into further subsections. Five of the parts are covered sufficiently with one or two subsections (‘Reproduction at work’, ‘Occupational cancer’, ‘Occupational diseases of the skin’, ‘Diseases associated with microbiological agents’, and ‘Diseases related to environmental chemical factors’), but the chapter on ‘Diseases associated with physical agents’ requires nine subsections. The larger chapters include ‘Diseases associated with chemical agents’ (over 200 pages), ‘Diseases associated with physical agents’ (170 pages), and ‘Occupational lung disorders’ (132 pages). This edition adds in a chapter on ‘Nephrotic, neurotoxic, hepatotoxic and haemopoietic effects of workplace exposures’ that is useful in compiling a differential diagnosis list for work related possibilities. The index itself is a healthy 74 pages with a reasonable amount of cross referencing but, if the book was available as a CD-ROM, it would be even better; reference books should embrace this useful technology.

Hunter’s has some particularly readable sections which give the salient facts and information embellished with nuggets of background or historical data on the condition or disease. For example, the section on ‘Hand-arm vibration’ covers diagnosis, treatment management, current techniques for objective testing with comments on specificity and sensitivity, and just enough on the physics of vibration. It also points out that the adverse health effects were recognised by 1918—all this is contained in eight pages supported by four figures, three tables, and 100 references.

What was the book like over a three month period of use? I would dip into it for a specific query and find myself enticed into further pages of reading. Perhaps this was because of writing this review but, equally, the prose query and find myself enticed into further pages of reading. Perhaps this was because of reading this review but, equally, the prose

Dr H M (Bill) Foreman Memorial Fund

The trustees of the Dr H M (Bill) Foreman Memorial Fund invite applications for grants relating to study in respiratory disease and allied fields. Limited funds are available for registered medical practitioners to assist in travelling to countries other than their own to study respiratory disease, and also for support for clinical research abroad.

Intending applicants should write for further details to: Dr Brian H Davies, Llandough Hospital, Penarth, Vale of Glamorgan CF64 2XX, UK.