LETTERS TO THE EDITOR

Body composition and exercise performance in patients with chronic obstructive pulmonary disease (COPD)

The original article of Dr A M W J Schols and others in the October issue of Thorax shows that exercise performance, as indicated by the distance walked in 12 minutes, is related to the fat free mass of the patient. Fat free mass was taken to be an indicator of muscle mass, but the investigators found that arm muscle size was well related to other measures of muscle mass.

Several possible reasons for the relationship, two of which were related to respiratory muscle performance, were considered. There are however, other obvious possibilities.

Firstly, muscle mass may well be from the lower limbs. If this were so, then exercise capacity could be reduced because of the smaller capacity for this type of exercise, irrespective of respiratory muscle function.

Secondly, the patients who performed badly might take little regular exercise, or indeed may be limited by their symptoms in their exercise. Such patients would display lower limb muscle wasting. Consequently, performance may be related to muscle mass (particularly in the legs) by loss of activity. In the clinical evaluation of patients who are housebound with severe lung or cardiac disease, wasting of the quadriceps femoris and calf muscles is often a striking feature.

Dr Schols and his colleagues suggest that a compromised nutritional state may contribute to impaired performance, and that muscle mass determines exercise performance. Unwary readers may be led to conclude that patients do badly because of malnutrition, or even that improved nutrition might be beneficial. This is not necessarily so. Correlation does not indicate cause and effect: even if there is such a relationship, which is cause and which is effect may not be self evident.

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AUTHOR’S REPLY

Nutritional depletion commonly occurs in patients with COPD. It is well established that body mass depletion exerts detrimental effects on both respiratory and skeletal muscle function. In this article we also found a strong negative effect of body mass depletion, measured by body weight and fat free mass, on exercise performance in a group of patients with COPD, including a substantial proportion of underweight patients.

Dr Drummond suggests in his letter that independently of body mass depletion a selective loss of mass and strength of the lower limb muscles, irrespective of respiratory muscle function and due to inactivity, may be an important reason for exercise impairment in these patients.

We recognise that inactivity may adversely influence muscle mass and function in COPD. Our findings, however, do not confirm that muscle wasting in the patients was confined to the lower limb muscles.

1. Arm muscle circumference and fat free mass were significantly interrelated (r = 0.51, p < 0.001).
2. The mean value of arm muscle circumference in the whole group was below normal (90% of the reference values). Although inspiratory mouth pressure in COPD may partly be influenced by a mechanical disadvantage, inspiratory mouth pressure reflects only respiratory muscle weakness.

The strong positive association between fat free mass and walking distance in the subgroup of underweight patients indicates that only when fat free mass drops to very low values is it critical for exercise performance. The results further suggest that in these patients nutritional measures (in combination with reactivation) may enhance physical performance.

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Effect of positive expiratory pressure breathing in patients with cystic fibrosis

We read the study of positive expiratory pressure (PEP) breathing in patients with cystic fibrosis by Dr C P van der Schans and his colleagues in the April issue of Thorax with interest. In their penultimate paragraph the authors speculate on high pressure PEP mask physiotherapy, a technique we have developed and investigated. Although we are inclined to agree with some of his speculations, we are surprised by his unsubstantiated statement that high pressure PEP may cause complications. We have considerable clinical experience of this method and believe that this speculation is wrong; unfortunately, such statements carry the risk of discouraging other centres to adopt an effective and well studied technique.

Since we developed this technique in 1982 our accumulated clinical experience adds up to 3866 patients treatment months, mostly in patients with cystic fibrosis. In these nine years there has been one spontaneous pneumothorax in an 11 year old girl, four hours after her morning PEP session. After treatment by tube drainage and pleural sclerosis the child recommenced her high pressure PEP and since then has cleared her lungs exclusively with this technique. This was the only case of spontaneous pneumothorax in our 104 patients with cystic fibrosis, which argues strongly against an increased risk of pneumothorax with high pressure PEP.

Airway distension, due to the back pressure of forcefully exhaling against a resistive load, might impose some stress on airway walls. Although this would theoretically increase the risk of bronchial artery bleeding, we have in fact only had one serious bleeding episode that required bronchial artery embolisation.

Another effect of high pressure on airway walls is evident clinically and has recently been documented in a comparative study of different chest physiotherapy techniques; it occasionally induces bronchospasm in patients with airway hyperreactivity. Nevertheless, such patients frequently prefer to use high pressure PEP because of the technique’s superior speed and efficacy; in such cases we prescribe a bronchodilator.

We conclude of the negative clinical experience with positive pressure ventilators in patients with obstructive airway disease is occasionally and uncritically transferred to high pressure PEP. There are, however, important differences between the two techniques: whereas externally developed positive pressure introduces distending forces across the airways, expiratory muscle contraction against a resistive load increases pressure in the intrathoracic compartments. The pressure gradient is thus determined exclusively by the static elastic recoil pressure of the lung, irrespective of transpulmonary pressure. Another consequence of homogenous intrathoracic pressure is the lack of compression of the alveolar capillary bed, plus an unaltered transmural pressure on the pulmonary arteries.

In summary, there is substantial clinical experience that testifies to the safety of the technique. Speculation on potential complications may be based on ill understood concepts and beliefs rather than on hard data, as collected by controlled investigations and continued analysis of bedside clinical work.

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AUTHOR’S REPLY

We would like to thank Professor Zach and Dr Oberwalderner for their response to our article. Our warnings that high positive airway pressures may cause complications is not based on an “ill understood concept or beliefs,” as they suggest; it is supported by their own statement that the technique is “potentially harmful” (their ref 2). That high expiratory pressure does not cause any complications is based on their observation on the incidence of complications, such as respiratory arrest and bronchospasm, in a group of 64 patients. Moreover, the haemodynamic effects of increased airway pressures, which may in some patients have negative effects, are ignored. The authors claim that a group of 64 patients, most with cystic fibrosis, is too small for a claim that the technique is always safe in all patients.

The supposition that high positive expiratory pressure is “potentially damaging” is interesting, but the introduction of new physiotherapeutic methods should be accompanied by a critical consideration of their effectiveness and possible side-effects, and the type of patient to whom this technique can be safely applied. Comparison between results for different groups of...
patients, or with control measurements, is in these circumstances in our opinion essential.

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Pneumocystis carinii pneumonia complicating low dose methotrexate treatment for rheumatoid arthritides

We read with interest the paper by Dr A Wollner and his colleagues (March 1991; 46:205-7) as we have recently reported two cases of pneumocystis pneumonia in immunocompromised patients with rheumatoid disease.1 A 42 year old woman with severe seropositive rheumatoid arthritis started on oral methotrexate treatment 7.5 mg per week and developed pneumocystis pneumonia after 16 weeks of treatment. Despite a stormy course, requiring ventilation for almost three weeks, she made a full recovery. It is of interest that at the onset of pneumonia her total white cell count was 14.6 × 10^9/L with relative lymphopenia (total) lymphocytes 290 × 10^9/L, 2% of total). Our second patient was a 55 year old man treated with cyclophosphamide 2.5 mg/kg plus prednisolone 40 mg for microscopic polyarteritis nodosa. After eight months of treatment he developed pneumocystis pneumonia. Again, despite a normal total white cell count of 4.9 × 10^9/L, he had profound lymphopenia (1%, 43 × 10^9/L). This patient also required assisted ventilation but responded well to treatment, with complete resolution of symptoms.

With the increasing use of immunosuppression for patients with rheumatoid arthritis and similar conditions, the guidelines on falling total white cell counts would seem to be ineffective. The lymphopenia found in our own patients and in all three of the cases recorded by Dr. Wollner and colleagues would suggest that this makes a substantial contribution to the immunodeficiency resulting in opportunistic infections. We advise that the absolute lymphocyte count should also be monitored in patients treated with cytotoxic drugs and that the dose should be adjusted promptly if profound lymphopenia develops.

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The author's preface states that this book is not intended to compete with comprehensive textbooks but is a series of patient topics and controversies, aimed primarily at MRCP candidates. In this object it only partially succeeds. The book is organised in a standard way. Basic anatomy and physiology covered adequately in the first five chapters; chapter 6 discusses basic investigations, and the middle chapters deal with clinical topics. The coverage is adequate but from the MRCP candidate's viewpoint there are important omissions. Recent developments are popular topics in membership examinations and coverage of these is patchy. For example, discussion of atypical mycobacterial infections is brief, and no mention is made of the recent improvement in the understanding of the genetics of cystic fibrosis or of biphosphonates in the management of malignant hypercalcaemia. The use of antineutrophil antibodies in the diagnosis of Wegener's granulomatosis is not mentioned.

Fine detail on radiographs is difficult to see owing to reproduction on print quality paper. The radiographs of abnormalities and 15.5 look very similar although the attached diagnoses are different. The book concludes with case histories, which are rather brief and would be improved if more information were given and questions were more akin to the "grey" cases posed in the membership examination. The MCQ questions are a useful aid to revision. Thus, although most standard topics are covered well, there are important omissions in diagnosis and management of topical respiratory conditions.—JAR

Immunologically Mediated Pulmonary Diseases.

This multi-author volume deals with a wide range of lung diseases in which immunological processes are thought to play a part in pathogenesis. The authors are exclusively American or Canadian and most are acknowledged experts in their spheres. The topics covered range from asthma, including occupational asthma, occupational lung disease, various disorders in which lung vasculitis is a component (four chapters), eosinophilic pneumonia, granulomatous lung diseases, and diseases characterised by the presence of fibrosing alveolitis. Rarer lung problems, such as pulmonary alveolar proteinosis, pulmonary haemorrhage syndromes, and eosinophilic granuloma, receive comprehensive attention and I welcome the detailed chapter on the complex disorders in which low grade lymphoproliferative processes operate, such as lymphomatoid granulomatosis. The editors' aim has been to integrate advances in the basic sciences with a clinical approach to diagnosis and management and each chapter addresses each of those issues separately. The text is directed mainly at practising clinicians and each chapter has been written, successfully in my view, with this in mind. No major area has been ignored. Each chapter is well referenced numerically, though there are few references more recent than 1989. The quality of the illustrations is somewhat variable. Particularly informative and well written chapters include those on pulmonary com-

applications in collagen vascular disease, lymphomatoid granulomatosis and lymphoproliferative disorders of the lung, pulmonary haemorrhage syndromes, and idiopathic pulmonary fibrosis. This book has achieved its aim of combining basic science with clinical practice in a very readable form. Anyone concerned with the management of pulmonary disease, either as pulmonary physicians or as rheumatologists, clinical immunologists, or other clinicians seeing patients with pulmonary problems, should find much of interest here; and at $95 the book is extremely good value for money. Medical students and staff in training would find this an invaluable source of reference—RMdUB

Asthma—its Pathology and Treatment.

This book comprises several reviews with discussion sections derived from a three day symposium and attempts to cover comprehensively the pathology and treatment of asthma. In the main the book is well written and has drawn on the expertise of several acknowledged experts. Of particular note are the sections on asthma epidemiology and airway epithelium. Occasional chapters suffer from a disproportionate emphasis on the authors' own work. There are one or two subjects that are not covered particularly well, including cytokines, occupational asthma, and certain of the new asthma treatments, such as the potassium channel activators, in addition to some of the more practical aspects of asthma management. It would have also been useful to have an overview chapter, either at the beginning of this sections on asthma treatment or at the end. All things considered however, this book represents a comprehensive review of asthma, which would be a useful addition to the bookshelf of the asthma specialist. It would make a useful reference book for general respiratory physicians, but for this group the price may prove prohibitive.—AK

NOTICES

International meeting on pulmonary mechanics and chest physiotherapy

The Fourth International Meeting on Pulmonary Mechanics and Chest Physiotherapy will take place in Brussels on 30 May 1992. The main topic will be breathlessness and the free communications will relate to this. Details from Professor R Sergysels, Clinique de Pneumologie, Hôpital Universitaire St-Pierre, rue Haute 322, 1000 Brussels, Belgium.

Course on lung pathology

A comprehensive course of lectures on lung pathology and practical, hands on microscopy sessions will be held at the National Heart and Lung Institute from 4-4 June 1992. The course is aimed at pathologists in training and consultant pathologists wishing to update their knowledge. The fee will be £333. Further information from Professor B Corrin, Lung Pathology, Brompton Hospital, London SW3 6NP (Tel: 071-351 8420, Fax: 071-351 8443).