“Invalidity” due to chronic bronchitis and emphysema: how real is it?

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ABSTRACT Hospital discharges and deaths attributed to chronic bronchitis and emphysema have fallen in recent years while the number of those receiving invalidity benefit for these conditions has remained constant. One hundred and fifty seven such persons were invited to take part in this study, in which the diagnosis, degree of respiratory impairment, and other factors contributing to disability were reviewed. The scope for rehabilitation was considered. One hundred subjects agreed to take part; 96 were men and 70 were over 60 years. In only 67 was the main diagnosis chronic bronchitis and emphysema. There was a bimodal distribution of functional impairment, most being severely disabled, but in 20 the FEV1 was within the normal range. Among these asthma was more common and psychological factors were important. Economic factors contributed to “invalidity,” especially among those with a normal FEV1. For 32 of the 57 who had declined to take part some information was available from hospital records. The findings in this group were similar. There was little scope for rehabilitation in the group as a whole as motivation was poor. Less than half had ever seen a chest physician. Specialist assessment before invalidity benefit is claimed is probably desirable.

Chronic respiratory disease is a major problem in the United Kingdom and accounts for 10% of working days lost. In 1982 60 000 men and 5000 women were in receipt of invalidity benefit on account of respiratory disorders. Over the last 15–20 years the number of deaths and hospital discharges attributed to chronic bronchitis and emphysema has fallen considerably, yet the number of claimants for invalidity benefit on account of these conditions has remained relatively constant. It was suggested by a Royal College of Physicians report that the reasons for this should be examined and the possible scope for rehabilitation assessed. This paper reports the results of such a study of subjects drawn from one health district in the North of England.

Subjects and methods

All persons in the chosen health authority district who were in receipt of invalidity benefit for chronic bronchitis and emphysema in February 1983 were approached by the Department of Health and Social Security (DHSS) and invited to take part in the study. Undertakings were given on continuity of benefit and confidentiality of results. General practitioners were informed of the study and subsequently of the results relating to their patients. Persons who agreed to take part were visited at home by one of us (VP). The Medical Research Council (MRC) questionnaire on respiratory symptoms, with additional questions on angina, atopy, current treatment, occupational history, and reasons for “going on invalidity” was completed. Simple spirometric tests were carried out. Breathlessness was graded according to an extended Fletcher Scale, a portable bellows spirometer being used. Those who were willing subsequently attended hospital for clinical examination, chest radiography, and measurement of single breath carbon monoxide transfer factor and of lung volumes by helium dilution (Morgan Transfer Test B). In the absence of contraindications a three index progressive exercise test was performed on a cycle ergometer. The test entailed measuring the ventilation, oxygen uptake, and cardiac frequency during progressive exercise. The procedure is described elsewhere. From weight and height the body mass index (weight divided by

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height squared) was calculated; the reference values were those of Garrow (personal communication, 1983). Reference values for the indices of lung function were taken from a standard source. Chronic bronchitis was diagnosed from answers to the MRC questionnaire and emphysema on the basis of increased total lung capacity and reduced carbon monoxide transfer factor and Kco. In practice these conditions overlap and we have considered them together, in common with the DHSS. On the basis of all available information a clinical assessment of the main factors causing disability in each subject was made by one of us (SJP) and a report was sent to the general practitioner, who was invited to refer the subject back for further investigation or treatment if indicated, usually for a trial period of steroid treatment. The variables were submitted to multiple regression analysis. The linear regression of grade of breathlessness on forced expiratory volume was compared with that for patients with chronic lung disease reported previously and for men aged 50–69 years (present and former shipyard workers) studied in the course of an occupational respiratory survey. For interpretation of the results the 5% level of probability was taken as significant.

Limited information was available from the hospital records of some of those who had declined to take part.

Results

One hundred subjects (96 men, four women) agreed to be visited at home and 76 of these attended the hospital. The remainder regarded themselves as too old or ill or as having domestic commitments preventing their attendance.

Most subjects were over 60 years (fig 1). The main occupation of 70 subjects before limitation by disease was coalmining or other heavy manual work. Twenty two were engaged in less heavy manual or skilled work, while seven had supervisory or clerical jobs. One was mentally subnormal and had never worked. Sixty one were smokers, 35 ex-smokers, and four non-smokers. Among the 96 smokers and ex-smokers 65 had at some time smoked more than 20 cigarettes daily.

There was a strong tendency to obesity, 57% having a body mass index greater than 25 (normal range 20–25: JS Garrow, personal communication, 1983). Clinically obesity appeared to be an important problem but for the group as a whole the mean value and distribution of the body mass index did not differ significantly from the reference values. Most subjects had quite severe ventilatory impairment as judged by a reduced forced expiratory volume (FEV1), but in 20 subjects the FEV1 was within 1.64 SD of the predicted value and regarded as normal (fig 2).

The main cause of disablement in each subject is shown in table 1. Where this was non-respiratory disease there was usually associated chronic productive cough, with or without mild airways obstruction, not thought to be contributing appreciably to the subject's disability.

Among those with a normal FEV1 there was less chronic bronchitis and emphysema but more asthma

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**Fig 1** Distribution of subjects by age group.

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**Fig 2** Subjects distributed by grade of ventilatory impairment. 0 = ≤ 1.64 SD below predicted; 1 = ≥ 60% predicted; 2 = ≥ 40% predicted; 3 = < 40% predicted.
Three in this group were considered to be suffering mainly from psychological problems (anxiety, depression, low motivation). In a further three subjects psychological factors were considered to make a major contribution to disability. In about a third of this group therefore psychological factors were an important cause of disability. For 32 of the 57 non-participants relevant hospital records were obtained. This group appeared not to differ in a major way from the participants.

The grade of breathlessness was correlated negatively with the FEV₁ and transfer factor and positively with the minute ventilation, respiratory frequency, and cardiac frequency under standard conditions of submaximal exercise. These indices were to varying degrees intercorrelated and on multiple regression analysis the physiological variation was best described by the partial regression coefficient on FEV₁; when this was included the other indices did not significantly reduce the variance. The regression coefficient of grade of breathlessness on FEV₁ did not differ significantly from that for the control groups. At all levels of FEV₁, the present subjects had a significantly higher grade of breathlessness than those in the control groups, which did not differ significantly from each other (clinical grade = 4.27 + 1.37 (on IB) − 0.82 FEV₁ (l) (SEE = 0.485; IB = invalidity benefit).

Sixty subjects regarded chest disease as the main reason for "going on invalidity." Opportunities for early retirement (in the mines at 58 years) or redundancy were clearly important (table 2). For 15 of the 20 with a normal FEV₁, factors other than respiratory disease accounted for their stopping work.

Twenty seven participants were considered to merit further investigation with a view to improving treatment. When this was suggested to the general practitioners only 13 subjects (48%) took up the offer. In 10 of these cases treatment was modified with some benefit. Where breathlessness and disability was clearly out of proportion to functional impairment the possibility of exercise training was raised but rejected in every case. Forty two had never had a specialist opinion on their respiratory disease. The severity of their functional impairment did not differ significantly from that of those who had such an opinion.

**Discussion**

Invalidity benefit replaces sickness benefit when a person has been unable to work for 28 weeks or more. It is payable until 70 years of age and has financial advantages over unemployment benefit, which is the usual alternative. In this study the subjects were predominantly from occupations entailing physical exertion and from socioeconomic groups where heavy smoking was the rule. These factors are likely to have contributed to the early development of breathlessness. The tendency to obesity that they showed did not appear on statistical analysis to be related to breathlessness, although it was undoubtedly a major factor in a few individuals. The prevalence of this problem in the group as a whole may have masked its contribution to breathlessness.

The bimodal distribution of ventilatory impairment was interesting, revealing a subgroup with normal ventilatory capacity. Asthmatic individuals partly accounted for this, with their better basic lung function. Optimum control of asthma might have prevented some of these people from stopping work. Psychological problems and poor motivation were also conspicuous in those with a higher FEV₁. In recent longitudinal studies, however, there was no significant correlation between changes in psychiatric morbidity and breathlessness, so the present association was not necessarily causal.

A large number (28%) mentioned economic factors rather than their physical condition as the main reason for stopping work. In some cases this seemed to reflect opportunism in the context of a high local unemployment rate and many compulsory redundancies, and in different circumstances these individuals might have worked longer. In others there is no doubt that the chance of stopping work on

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**Table 1 Principal diagnoses of participants**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Normal No (%)</th>
<th>Reduced No (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic bronchitis and emphysema</td>
<td>8 (40)</td>
<td>59 (74)</td>
<td>67</td>
</tr>
<tr>
<td>Asthma</td>
<td>5 (25)</td>
<td>10 (12)</td>
<td>15</td>
</tr>
<tr>
<td>Bronchiectasis</td>
<td>0</td>
<td>5 (6)</td>
<td>5</td>
</tr>
<tr>
<td>Pneumocociosis</td>
<td>1 (5)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Non-respiratory disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac disease</td>
<td>2 (10)</td>
<td>3 (4)</td>
<td>5</td>
</tr>
<tr>
<td>Neurological disease</td>
<td>0</td>
<td>1 (1)</td>
<td>1</td>
</tr>
<tr>
<td>Obesity</td>
<td>1 (5)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Psychological problems</td>
<td>3 (15)</td>
<td>2 (2.5)</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>

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**Table 2 Reasons for "going on invalidity"**

<table>
<thead>
<tr>
<th>Reason</th>
<th>Normal No (%)</th>
<th>Reduced No (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest disease</td>
<td>5 (25)</td>
<td>55 (69)</td>
<td>60</td>
</tr>
<tr>
<td>Retirement or redundancy</td>
<td>12 (60)</td>
<td>16 (20)</td>
<td>28</td>
</tr>
<tr>
<td>Non-respiratory disease</td>
<td>0 (0)</td>
<td>5 (6)</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>2 (10)</td>
<td>2 (2.5)</td>
<td>4</td>
</tr>
<tr>
<td>No information</td>
<td>1 (5)</td>
<td>2 (2.5)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>
favourable terms came just as they were exhausting their respiratory reserve.

It was disappointing that only 42% of those for whom further assessment was recommended returned for this, that 48% had never had a specialist opinion and probably never had even the simplest test of lung function. This is thought to be due to a generally negative attitude towards potential for improvement in chronic airways obstruction on the part of both patients and doctors. It is arguable that before a man or woman leaves work on health grounds a specialist opinion should be sought. While a few might then not be granted invalidity benefit, others who wish to work might be enabled to do so. Motivation falls with duration of unemployment and ill health and, if offers of further investigation or rehabilitation (including exercise training, which has been shown to improve performance in chronic respiratory disease) had been made at an earlier stage, a more positive response might have been obtained. The possible scope for this would, however, need to be assessed separately. The results of this study might have been different in an area with less unemployment and more non-manual work.

A copy of the questionnaire supplementing the MRC questionnaire has been lodged with the editor; further copies are available from the authors on request. We are grateful to the Chief Scientist of the Department of Health and Social Security, who arranged introductions to the subjects. We also thank Mrs T Curtis, who made many of the physiological measurements, and Mrs J Marshall for secretarial help. The study was financed by the Northern Regional and Newcastle Health Authorities.

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