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EDITORIAL

Revision of the European Community for Coal and Steel Questionnaire on Respiratory Symptoms

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Are questionnaires as useful in 1990 as in 1960?

The introduction of the British Medical Research Council (MRC) Questionnaire on Respiratory Symptoms in 1960 [1] was a major advance in the investigation of the epidemiology of chronic respiratory disease. The emphasis on standardization and validation of the questions and the attempts to control observer bias [2] brought rigour to what had previously been a chaotic field. The European Community for Coal and Steel (ECCS) Questionnaire for studying chronic bronchitis and emphysema first appeared in 1962 and was followed by several other questionnaires [3, 4], which were originally largely based on the British MRC model. However "anonymous" and authoritative these documents appear, in fact they reflect individual contemporary opinions about the important features of chronic respiratory disease. If the standardization of questionnaires is not to impose penalties which outbalance their benefits, they must evolve in parallel with changes in our understanding of these diseases. The latest revision of the ECCS questionnaire published in the February 1989 issue of the European Respiratory Journal [5] provides an opportunity to review the evolution of questionnaires over the last 30 yrs.

The major questions included and validated in the original questionnaires were related to cough, sputum production, dyspnoea and infective chest illnesses. Less emphasis was placed on questions on wheezing and asthma, partly, no doubt, because of the difficulty in framing questions which could be validated. But an equally important factor was that, at that time, the major research focus was on the overwhelming morbidity and mortality due to largely irreversible disease, chronic bronchitis and emphysema in the general population and pneumoconiosis in the occupational field. Since these original questionnaires were produced, the importance attached to the diagnostic and prognostic information provided by lung function tests has greatly increased, while that attached to the presence of chronic cough and phlegm has declined. Furthermore, the perceived importance of asthma as a cause of chronic respiratory disease both in the general population and in certain occupations has increased, while the prevalence of other forms of chronic respiratory disease due to smoking, environmental and occupational factors has declined in some countries.

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Reduction in the prognostic importance of chronic cough and expectoration

The original emphasis on the importance of chronic cough and expectoration arose from the "British hypothesis" which proposed that disabling airflow obstruction in smokers was a consequence of damage caused to the airways and alveoli by repeated acute bronchopulmonary infections. Because such infections were associated with the presence of chronic cough and sputum production, these were regarded as the forerunners of breathlessness and disability. However, in 1976 FLETCHER and co-workers [6, 7] found that recovery of lung function after acute bronchopulmonary infections was almost always complete. Although they found the expected associations between mucus hypersecretion, increased frequency of infection and lower absolute levels of forced expiratory volume in one second (FEV_1) they concluded that neither mucus hypersecretion nor bronchial infection caused FEV_1 to decline more rapidly, because after adjusting for age, smoking and FEV_1 level, there was no independent correlation between indices of mucus hypersecretion or bronchial infection and annual decline in FEV_1. They therefore proposed that the hypersecretory and obstructive components of smoking-induced chronic lung disease should be regarded as "largely unrelated conditions, chronic phlegm production being much less important". Indeed in their study FLETCHER and co-workers [7] found that about 20% of male smokers with chronic bronchitis had a completely normal FEV_1 at age 50 yrs, whilst a further 25% of smokers with definitely reduced FEV_1 denied chronic productive cough. The proposed distinction between the hypersecretory and obstructive disorders was subsequently confirmed by a large 20 yr follow-up study by PETO and co-workers [8], which showed that after adjustment for initial lung function, the relative risk of chronic phlegm production for mortality from chronic lung disease was not statistically significant.

The same dissociation between the processes responsible for chronic mucus hypersecretion and progressive airflow obstruction has also been postulated for some occupational diseases [9] and for chronic childhood respiratory disease [10].

Additional factors dissociating chronic cough and persistent airflow obstruction in the population include reduction in the tar content of cigarettes (which reduces expectoration without definitely reducing the tendency

to progressive airflow obstruction [11]) and an increasing number of ex-smokers who typically produce less phlegm but retain any airflow obstruction which developed during their smoking years. Reduction in environmental air pollution may also result in reduced phlegm production.

Increasing importance of pulmonary function tests for diagnosis and prognosis

With increasing recognition of the distinction between the hypersecretory and obstructive types of smoking-related chronic lung disease, the importance of testing lung function in epidemiological surveys has increased. Apart from defining the presence of impairment of ventilatory function, spirometric tests also have considerable prognostic value, at least in middle-aged males. FLETCHER and co-workers [6, 7] found the annual rate of decline in FEV_1 over 8 yrs was related to the level of FEV_1 which suggested that susceptible smokers could be identified by reduction in FEV_1 by early middle-age. For this to be true, individuals in the top or bottom percentiles for FEV_1 have to "track" in the same percentile over many subsequent years. "Tracking" was supported by a 20 year follow-up study of 2,718 men whose pulmonary function was assessed between 1954 and 1961, in whom the risk of death from chronic airflow obstruction was more than 50 times greater in men whose initial FEV_1 was >2 SD below average values, than in men whose initial FEV_1 was above average [8]. Most of these men were studied initially in middle-age, during their working life, at a time when there were only minor abnormalities in FEV_1.

Distinction of asthma from chronic obstructive pulmonary disease (COPD) as causes of persistent airflow obstruction

In the last thirty years the relative importance of smoking, environmental and occupational factors thought to be responsible for COPD has declined in many countries, while there have been possible increases in asthma prevalence (possibly related to other environmental and occupational factors). Consequently a major current interest of epidemiologists is in the development of questionnaires and objective tests for studying the prevalence of asthma in different communities [12–15]. Although tests of spontaneous or induced changes in airway function, supported by objective tests of allergic status, play an increasing part in the diagnosis of asthma, it has become obvious that asthma is not synonymous with bronchial hyperresponsiveness or any other simple objective test. Thus, objective tests still need to be supported by questions about the age of onset, variability in symptoms, nocturnal waking with breathlessness and even self- or physician-based diagnosis of asthma. In view of the exceptional difficulty experts have had in agreeing a definition of asthma, it seems likely that a combination of questions and objective tests will continue to be needed to establish a working diagnosis of asthma for some time yet!

Conclusions

All of these changes modify the role of the questionnaire but certainly do not make it redundant. Obvious advantages of questionnaires are their cheapness and that they can be self-administered; disadvantages are the wide range of biases (linguistic, social, etc.) that may influence the replies given to a particular question. Words such as wheezing have proved difficult to translate. Questions as simple as "do you have asthma?" or "has a physician ever diagnosed you as having asthma?" are useful in some communities [16] but cannot be safely transferred to others [13, 14]. Because validation of questions is tedious it is sensible, where possible, to retain the central core of previously validated questions. Most questionnaires were developed for epidemiological use on large numbers of subjects where simplicity, brevity and repeatability often outweigh the occasional misinterpretation by individuals. Sometimes clinical investigators appear to be over-zealous in their adherence to the original epidemiological definitions of chronic bronchitis.

When studying smaller numbers of subjects, it is often useful to add more detailed (but validated) questions such as the cough score developed by FIELD [17]. Specially developed questionnaires may also be needed to detect short-term change with treatment in individuals [18], to assess the effect of treatment on quality of life in patients with chronic lung disease [19], or to investigate the all-important symptom of breathlessness [20]. Any new questions need to be carefully defined, validated and examined for ambiguities and shown to be repeatable. Some local validation is required because results may be influenced by technical inexperience, linguistic problems or genuine ethnic differences. It is almost always useful to support questionnaires with objective data [15, 21]. Although, by their very nature, questionnaires must have a long life, in common with other methods of investigation they need to be updated, criticized and re-validated if they are to remain useful probes for innovative research.

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