EDITORIAL

Breathlessness and quality of life in old age

Breathlessness is a sensation with which we are all familiar as a normal accompaniment to vigorous exercise. Abnormal breathlessness is usually referred to in Greek as dyspnoea (disordered [dys-] breathing [-pnoea]). But what differentiates 'normal' breathlessness on exertion from abnormal dyspnoea?

Like other subjective sensations (such as pain), breathlessness is difficult to describe. Dyspnoea may be qualitatively as well as quantitatively different from exertion-related breathlessness [1]. The feeling of increased effort of breathing seems to be common to both exertional breathlessness in normal individuals and dyspnoea associated with some lung conditions (such as chronic obstructive pulmonary disease and interstitial lung disease), but other descriptions such as chest tightness and rapid or shallow breathing are used by patients with other pathologies [2].

How do we become breathless? Dyspnoea may result from a mismatch between outgoing motor command from the brainstem to the ventilatory muscles and incoming information from receptors in the airways, lungs and chest wall [3]. However, normal individuals show a wide variation in their rating of dyspnoea at a given level of ventilation [4]. Moreover, studies of patients with lung disease show that the relationship between lung function impairment and intensity of dyspnoea is weak [5]. The reasons for this variation in symptom perception are likely to include physical fitness and the context in which the symptom occurs, as well as psychological factors, emotional state, previous experience and expectations.

As part of normal ageing, structural changes occur in components of the respiratory system [6]. These include loss of elastic recoil of the lung, stiffening of the chest wall, increased anteroposterior chest wall diameter, reduced respiratory muscle strength and decreased alveolar surface area. As a result of these changes, there is a measurable reduction in vital capacity and expiratory airflow rates, and an increase in residual volume with increasing age. Changes in respiratory control also occur: older adults have a diminished ventilatory response to hypoxia and hypercapnia [7], and reduced awareness of both bronchoconstriction [8] and added elastic and resistive ventilatory loads [9].

Do these changes alter awareness of dyspnoea in older adults? The decrease in perception of chemical stimuli and respiratory loads might suggest that dyspnoea should occur later during exercise or in response to a disease process in old than young individuals. However, the ventilatory response to exercise is increased in older people, although arterial blood gas homeostasis is maintained even during vigorous exercise [10, 11]. Healthy older subjects rated their breathlessness during exertion as greater than whole-body fatigue—in contrast to young people, who rated fatigue greater than breathlessness [11]. These data suggest that the effect of ageing on respiratory function may contribute to the dyspnoea experienced by some older people. The fact that ventilatory responsiveness to exercise can decrease after a physical training programme suggests that some of these effects may be reversible or even avoidable [12].

Deconditioning

Other factors that might contribute to an increased prevalence of dyspnoea in older adults include the well-documented age-related increase in cardiopulmonary diseases, such as cardiac failure and chronic obstructive pulmonary disease. In addition, cardiovascular deconditioning secondary to inactivity becomes more prevalent with increasing age. Deconditioning promotes early lactic acid production by skeletal muscles during exercise, which in turn increases the ventilatory response and heightens dyspnoea [13]. Inactivity also results in weight gain and wasting of the leg limb muscles. This can produce a vicious cycle, with breathlessness leading to a reduction in physical activity to avoid discomfort, which in turn leads to deconditioning and muscle wasting promoting further dyspnoea and fatigue [14, 15].

Limitation of activity to avoid breathlessness may be a particularly common response in older people, who may accept the symptom as an unavoidable consequence of ageing (the 'what can you expect at my age?' response).

What is the evidence that dyspnoea is more common in older people? Although numerous epidemiological surveys have estimated the population prevalence of dyspnoea, few have included large numbers of older people. Furthermore, the lack of a standard definition of dyspnoea limits the comparability of some studies. Probably the most widely used rating scale for dyspnoea is the Medical Research Council (MRC) scale, which measures perceived respiratory disability by rating the effect of breathlessness on mobility [16]. A score of 3
(“I walk slower than people of the same age on the level because of breathlessness or have to stop for breath when walking at my own pace on the level”), 4 (“I stop for breath after walking 100 yards or after a few minutes on the level”) or 5 (“I am too breathless to leave the house”) on the MRC scale has been suggested as an indication of clinically significant breathlessness.

**How common is dyspnoea in older people?**

Using this definition, most estimates of the prevalence of dyspnoea in young populations (aged less than 70 years) give a figure of less than 10% [17–20], although prevalences of up to 14% in men and 18% in women have been reported [21, 22]. The few studies of respiratory symptoms in older populations have given widely differing results. In two studies, the prevalence of dyspnoea (MRC grade 3+) in adults aged over 60 years was similar to that reported for younger populations (around 10%) [23, 24]. A further study using the same definition of dyspnoea found a prevalence of 19.4% in adults over the age of 65 [25]. Two reports using different definitions of dyspnoea in elderly populations have given a higher prevalence of symptoms: in one, “breathlessness at rest” was present in 20% of individuals [26], and the other described “exertional breathlessness” in 38% [27]. The reasons for the wide variation in symptom prevalence between different populations may include differences in age range, smoking habit, occupational history, geographical location and exposure to environmental pollution.

In this issue of *Age and Aging*, Ho *et al.* report the results of a cross-sectional population study of 1404 randomly-selected people aged over 70 living at home in Wales [28]. The response rate to the postal questionnaire in this study was excellent, and there was strong agreement between the postal questionnaire and subsequent interview. The prevalence of dyspnoea (MRC grade 3+) was 32.3%, which adds weight to the accumulating evidence that this is an extremely common symptom in older populations.

**Quality of life**

Is it important that up to one-third of community-dwelling old people are significantly breathless? The consequences of dyspnoea have been studied in patients with chronic lung disease, who show a high prevalence of anxiety and depressive symptoms [29]. In addition, dyspnoea leads to exercise limitation and therefore disability [15]. These impacts can be quantified using quality of life questionnaires, which aim to measure the patient’s own assessment of their physical, psychological and social functioning and the effects of any distressing physical symptoms [30]. Using such questionnaires in patients with chronic lung disease confirms marked impairment in quality of life [15]. This impairment is no less in older people, despite the fact that activity levels tend to decrease with age even in the absence of disease [31].

Interestingly, the most important determinants of quality of life impairment seem to be functional activity and emotional status—rather than degree of reduction in lung function [32]. In Ho and co-workers’ study the impact of dyspnoea extended beyond reduced mobility to affect kitchen and domestic tasks and leisure activities as well.

What can be done to reduce the burden of this common and disabling symptom? First, heightened awareness of the impact of breathlessness on day-to-day life may promote investigation to identify potentially treatable causes such as chronic obstructive pulmonary disease and cardiac failure. Secondly, the study by Ho *et al.* clearly illustrates that the management of the breathless patient should not stop at symptom control but extend to address limitation of functional ability and reduction of disability. Finally, promotion of physical activity has an important role to play. Obesity and physical deconditioning are both potent causes of dyspnoea that could potentially be prevented by regular physical activity [12, 14]. Moreover, studies of patients with chronic lung disease show a reduction in exertional dyspnoea and improved exercise tolerance in response to exercise training [33]. Perhaps the time has come to be more pro-active in seeking out the large proportion of older patients at home whose lives are being limited by dyspnoea, and in making participation in regular exercise programmes more enjoyable and accessible for them.

**References**

D. S. Renwick


