Co-morbidity in older patients with COPD—its impact on health service utilisation and quality of life, a community study

J. Yeo1, G. Karimova2, S. Bansal3

1Education Centre, Wansbeck General Hospital, Woodhorn Lane, Ashington, Northumberland NE63 9Jj, UK
2Research & Development Department, City Hospitals Sunderland, Kayll Road, Sunderland SR4 7TP, UK
3Consultant Geriatrician, Geriatrics Department, City Hospitals Sunderland, Kayll Road, Sunderland SR4 7TP, UK

Address correspondence to: J. Yeo. Email: jennyyeo@doctors.org.uk

Abstract

Background: co-morbidity has been shown to be an important consideration in COPD with an estimated prevalence of 84%. In the Netherlands, a weak association between health-related quality of life and lung function has been found, with a closer link to co-morbidity.

Objective: to determine the influence of co-morbidity on quality of life and health service utilisation in older patients with COPD in the community.

Design: observational cohort study.

Setting: general practice in the North East of England that has a list size of 8300.

Participants: 27 patients aged 70 years or above on the practice COPD register.

Measurements: data on age and sex, spirometry to confirm the diagnosis of COPD, questionnaires to assess quality of life, activities of daily living (ADLs) and co-morbidity. Health service utilisation was recorded by the number of primary and secondary care attendances in the previous year.

Results: 10 had mild, 12 had moderate, and 5 had severe disease. Mean age was 76 years. Quality of life (QOL), co-morbidity and health service utilisation measurements were not significantly different between COPD severity groups. There was a significant positive correlation between increasing co-morbidity and poor QOL ($r = 0.45$, $P < 0.05$), and significant negative correlation between co-morbidity and ADL scores (scored inversely), $r = -0.54$, $P < 0.05$. Significant negative correlation was found between co-morbidity and primary care attendances ($r = -0.41$, $P < 0.05$) and significant positive correlation between worsening QOL and secondary care attendances ($r = 0.46$, $P < 0.05$).

Conclusions: co-morbidity has an important part to play in COPD assessment, more accurately reflecting QOL in our population. Health service utilisation did not correlate to forced expiratory volume (FEV$_1$)-defined COPD severity.

Keywords: chronic obstructive pulmonary disease, co-morbidity, elderly, quality of life, health service, utilisation

Introduction

The National Institute of Clinical Excellence (NICE) guidelines for chronic obstructive pulmonary disease (COPD) paint a bleak picture of the scale of the problem [1]. A total of 900,000 people are currently diagnosed with COPD in the UK, and this is thought to represent a substantial under-diagnosis. Prevalence rises with age, with 10% of men over 75 years of age thought to be affected [2]. Health service utilisation is an important issue in COPD, with an estimated use of 1 million in-patient days per year and cost to the NHS of £1 billion per year [1] with this set to rise for the foreseeable future [3].

The NICE guidelines accept that forced expiratory volume (FEV$_1$) provides an incomplete measure of severity and recommend that measures such as body mass index, dyspnoea and health status should be undertaken. They acknowledge that a staging system that offers a composite picture of disease severity is desirable but that none exists.

Co-morbidity is highly prevalent in patients with COPD, with one study reporting 84% of patients with one or more co-morbidities [4]. This also seems applicable to the primary care
population, with one study reporting a 73% prevalence of one or more co-morbidities, compared to 63% of controls [5]. Co-morbidity has been shown to be an important determinant of quality of life (QOL) in COPD, independent of FEV1 [4, 5] and of health service utilisation [3]. Quality of life has also been consistently associated with health service utilisation [6, 7].

The typical COPD patient is older than represented in the studies, and the co-morbidity measures employed have been largely incomplete [5, 8, 9]. Many studies recruit from secondary care [4, 6, 9], therefore excluding the large primary care population. There has also been no research in the UK on this topic to our knowledge. The aim of this study, therefore, was to determine how co-morbidity influenced QOL and health service utilisation in older patients with COPD cared for in primary care.

Methods

The study took place in a general practice in the North East of England, list size 8,300, between October and December 2003. Approval from the Local Research Ethics Committee of England, list size 8,300, between October and December was obtained. All those aged ≥70 on the general practice’s COPD register were invited to participate (n = 50). As this was primarily an exploratory study, no power calculation was carried out, though it was hoped that this study would ascertain parameters for a larger study. This age cut-off was chosen to concentrate on older subjects who are often neglected by the literature and have higher rates of co-morbidity. Four patients were un-contactable and three were deceased. Of the remaining 43 patients, 14 refused and 2 were withdrawn due to non-diagnostic spirometry. Refusals were more common in women (57%), but there was no difference in age. Twenty-seven patients were entered into the study. Written informed consent was obtained from all participants.

The St George’s Respiratory Questionnaire (SGRQ) was used to assess disease-specific QOL [10–12]. This consists of 50 questions, divided into three subscales of symptoms, activity and impact. The score ranges from 0 to 100, where 0 indicates no QOL impairment. We measured co-morbidity using the co-morbidity symptom scale which provides a patient-centred measure of the number and severity of co-morbidities present [13] and which has been validated in an in-patient and out-patient setting in elderly patients, though not specifically in COPD (see Discussion). This questionnaire consists of 23 items which assess the presence of a condition and also its severity in terms of symptoms (scored from 0 to 4), giving a maximum score of 92, representing maximal co-morbidity, and attempts to distinguish between cardiac and COPD-related dyspnoea via specific stem questions. Manchester Respiratory Activity of Daily Living Score was used to assess ADLs [14]. This is a 21-item self-reported questionnaire and is scored compositely in the range 0–21, with 21 signifying no impairment. British Thoracic Society (BTS) guidelines [15] were used to determine COPD severity. Health service utilisation was recorded retrospectively from the medical notes by the number of primary and secondary care attendances in the previous year. Attendances were split into COPD and non-COPD related for recording purposes.

The data were analysed using SPSS version 11 for windows. Data were expressed in means with standard deviations and one-way ANOVA was used to compare COPD groups. Pearson’s correlation was used to investigate relationships between the variables.

Results

Table 1 summarises the study population demographics and COPD severity groups according to BTS guidelines.

COPD severity (Table 2)

There was a significant difference in mean Manchester ADL scores between moderate and severe groups (13.4 versus 5.20, P<0.05). Quality of life (measured by the SGRQ) showed no significant difference between severity groups, though there was a trend to higher scores in the severe COPD group, indicating poorer QOL. There was no significant difference in health service utilisation between severity groups, though there was a trend to less primary care contact with increasing COPD severity. There was no relationship between co-morbidity and COPD severity.

Co-morbidity and QOL

The mean co-morbidity score was 16 (range 5–32, SD = 7), and the mean number of individual co-morbidities this represented was 8.0. The most common co-morbidities are listed in Table 1, with sensory impairment and arthritis/mobility problems the most prevalent.

There was a significant positive correlation between increasing co-morbidity and poor QOL (r = 0.45, P<0.05) illustrated in Figure 1, and significant negative correlation between co-morbidity and Manchester ADL scores (scored inversely), r = −0.54, P<0.05. A significant negative correlation was found between co-morbidity and primary care attendances (r = −0.41, P<0.05) and significant positive cor-

Table 1. Study population demographics and co-morbid conditions

<table>
<thead>
<tr>
<th>Sex</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>11</td>
</tr>
<tr>
<td>Mean age</td>
<td>76 years (range 70–83, SD 4.36)</td>
</tr>
<tr>
<td>Severity of COPD</td>
<td></td>
</tr>
<tr>
<td>FEV1 60–79% = mild</td>
<td>10 (37)</td>
</tr>
<tr>
<td>FEV1 40–59% = moderate</td>
<td>12 (44)</td>
</tr>
<tr>
<td>FEV1&lt;40% = severe</td>
<td>5 (19)</td>
</tr>
<tr>
<td>Common co-morbid conditions</td>
<td></td>
</tr>
<tr>
<td>Cardiac breathlessness</td>
<td>14 (52)</td>
</tr>
<tr>
<td>Angina</td>
<td>10 (37)</td>
</tr>
<tr>
<td>Arthritis</td>
<td>20 (74)</td>
</tr>
<tr>
<td>Mobility impairment</td>
<td>20 (74)</td>
</tr>
<tr>
<td>Unsteadiness, falls and syncope</td>
<td>12 (44)</td>
</tr>
<tr>
<td>Urinary problems</td>
<td>12 (44)</td>
</tr>
<tr>
<td>Hearing problems</td>
<td>19 (70)</td>
</tr>
<tr>
<td>Visual impairment</td>
<td>26 (96)</td>
</tr>
<tr>
<td>Medication side effects</td>
<td>18 (67)</td>
</tr>
</tbody>
</table>

COPD, chronic obstructive pulmonary disease; FEV1, forced expiratory volume. Values are expressed as n (%).
relation between worsening QOL and secondary care attendances ($r = 0.46$, $P<0.05$).

**Discussion**

We found that co-morbidity, QOL and health service utilisation had no significant relationship with FEV$_1$-defined COPD severity. Increasing co-morbidity was associated with deteriorating QOL, represented by increasing total SGRQ scores and decreasing Manchester ADL scores. Health service utilisation in primary care decreased with increasing co-morbidity, though there was not a corresponding rise in secondary care use.

We found a heavy burden of co-morbidity in our study population which may reflect the age of the participants but...
also that we used a more comprehensive measure of co-morbidity than other studies [5, 9]. There have been several problems measuring co-morbidity in the literature. Studies often rely on case-note review [9], lack severity information [5, 8, 9] and address only limited co-morbidities [9]. We therefore chose to use the co-morbidity symptom scale [13] which is self-reported and identifies the presence and quantifies the severity of an extensive range of co-morbid conditions.

The relationship between FEV1 and QOL, represented by the SGRQ score, has previously been well established in the literature [11]; however, other studies have shown stronger relationships with co-morbidity [4, 5]. This study supports the importance of the relationship between QOL and co-morbidity in COPD but failed to demonstrate any relationship with FEV1-defined severity. This may partly reflect that previous studies have predominantly looked at a much younger population [10–12] and may mean that our efforts to improve the overall health and functioning of older patients should be directed at these areas rather than COPD alone. It also casts doubt on the generalisability of studies which fail to take co-morbidity into account or actively exclude it, echoing a recent study which showed current inclusion criteria for COPD studies mean that ‘evidence’ is based on a highly selective subgroup, particularly as co-morbidity alone excludes 66% [16].

Health service utilisation did not correlate to FEV1-defined COPD severity in contrast to a recent study which demonstrated higher resource use in those who had a lower FEV1% predicted [3]. This may be due to the prevalence of co-morbidity in our population as a confounding factor; however, a mixed picture was found when looking at QOL and co-morbidity in relation to health service utilisation. Poor QOL correlated with higher secondary care use and high co-morbidity correlated with less primary care use. The reasons for this remain unclear. This could represent closer ties to secondary care, for those with more co-morbidity and poorer QOL, but could also be an example of the inverse care law. Quality of life has been shown to be an important determinant of resource use [6] and of hospitalisation [7]; however, the extent to which these studies can be extrapolated to the UK with its very different health care system is unknown. Co-morbidity has been shown to be an important determinant of resource use in the Netherlands [3] but not in Spain [7]. It would seem clear that a large-scale study in the UK on this topic is required.

The study obviously has several limitations. We had only small numbers of patients, which was partly a consequence of a high number of refusals during recruitment and may reflect the frailty of this population. We chose to recruit from only one general practice for practical reasons, which limited our potential numbers. We did, however, recruit from primary care, rather than a secondary care clinic population as in some other studies [4]. This should have ensured that our participants were more representative of patients with COPD in the community. We recruited participants from the practice’s COPD database, with the consequence that patients who had not been diagnosed with COPD at the time of the study would not have been identified. We also relied on retrospective data for health service utilisation which required medical notes to be accurate and up-to-date. However, as we were simply looking at the number of attendances, we did not anticipate this to be an issue. We chose to include no generic measure of QOL, instead concentrating on the respiratory specific measure, the SGRQ. This was used as generic measures may be less sensitive to pulmonary symptoms than the SGRQ, and to limit the number of questionnaires a frail population was expected to complete. We also performed spirometry on all patients, which has been lacking in some other studies [6].

This study attempted to examine the influence of co-morbidity and QOL in older patients with COPD. We found no statistically significant relationship between the traditional measurement of COPD severity, FEV1 and QOL or health service utilisation. Co-morbidity however appeared to be important in our population, significantly correlating to QOL and showing a variable relationship with health service utilisation. This study’s findings support NICE’s conclusion that FEV1 alone is an incomplete measure of severity and that another tool is required [1] which includes QOL and co-morbidity. Assessment of these two factors should be addressed during COPD assessment, particularly in older patients.

As a small study, this research raises the issue of co-morbidity in COPD for the first time in the UK. Further research in this area is needed.

Key points
- Co-morbidity is important in COPD assessment in older patients.
- Neither health service utilisation nor QOL correlated to FEV1-defined COPD severity.
- FEV1 is an incomplete measure of severity in COPD and development of other tools is needed.

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Conflicts of interest
None.

References
1. National Institute of Clinical Excellence (NICE). Chronic obstructive pulmonary disease: national guidelines for the man-
Low bone mineral density measurements in care home residents—a treatable cause of fractures

TERRY J. ASPRAY1, PAMELA STEVENSON1, SHARON E. ABDY1, DAVID J. RAWLINGS2, TOM HOLLAND1, ROGER M. FRANCIS2

1Institute for Ageing and Health, Newcastle General Hospital, Newcastle upon Tyne, UK
2Musculoskeletal Unit, Freeman Hospital, Newcastle upon Tyne, UK

Address correspondence to: T. J. Aspray, Department of Geriatric Medicine, Newcastle General Hospital, Westgate Road, Newcastle upon Tyne NE4 6BE, UK. Tel: (+44) 191 273 666x22675. Fax: (+44) 191 219 5049. Email: t.j.aspray@newcastle.ac.uk

Abstract

Purpose: to assess predictors of fracture risk and treatment for osteoporosis among elderly care home residents.

Subjects and methods: Design: cross-sectional survey; Setting: residents of care homes in Newcastle upon Tyne, UK; Participants: representative sample from residential care (87), nursing homes (105) and specialist homes for elderly people with dementia (elderly mentally infirm (EMI)); residential (124) and nursing (76); Main outcome measures: dual-energy X-ray absorptiometry bone mineral density (BMD) at calcaneum; functional assessments, including cognition, using Mini-Mental State Examination...