Quality of Life in Elderly Patients with Chronic Nonspecific Lung Disease Seen in Family Practice

Agnes C. Schrier, M.Sc.; Friedo W. Dekker, M.Sc.; Adrian A. Kaptein, Ph.D.; and Joop H. Dijkman, M.D., Ph.D.

We studied the quality of life of elderly patients with chronic nonspecific lung disease (CNSLD) in family practice. We also investigated the relationship between patients' somatic condition and their quality of life. Seventy patients, aged 40 years or older, with a diagnosis or symptoms of CNSLD completed the Sickness Impact Profile (SIP) and the list of daily activities (DAL). Pulmonary function (FEV₁, IVC) and respiratory symptoms were assessed. The results indicated that patients were more impaired in their physical and psychosocial functioning than healthy control subjects. Most lung function parameters showed no correlation with the SIP scores. The respiratory symptoms of wheezing and dyspnea were related to patients' quality of life. Patients with chronic obstructive pulmonary disease (COPD) were more restricted in their daily functioning than patients with asthma. Since the relationship between patients' somatic condition and their quality of life is weak, we recommend comprehensive care that encompasses psychosocial as well as somatic interventions.

CNSLD = chronic nonspecific lung disease; IVC = inspiratory vital capacity; SIP = Sickness Impact Profile; DAL = list of daily activities

Subjects and Methods

Patient Selection

In three family practices, all patients aged 40 years or older with a diagnosis or symptoms of CNSLD were identified. As CNSLD is an umbrella term, patients with diseases ranging from asthma to chronic bronchitis and emphysema were included. To avoid underdiagnoses, we also recruited patients with symptoms of CNSLD, such as chronic coughing, sputum production, dyspnea, wheezing and/or recurrent acute bronchial infection. Patients were excluded who had significant congestive heart failure, pulmonary diseases unlike CNSLD, or extrathoracic diseases. Also excluded were patients for whom the family physician considered that participation would be too burdensome.

The protocol was approved by the Ethical Committee of the Medical Faculty of the Leiden University Hospital. Informed consent was obtained from each subject who participated in the study.

Assessment Procedures

Patients completed a questionnaire on medical history, translated and modified from the British Medical Research Council (MRC) bronchitis questionnaire. The FEV₁ and the inspiratory vital capacity (IVC) were measured with a dry-rolling seal spirometer (Mijnhardt Voluograph), according to the European Standardization Report. On the basis of American Thoracic Society (ATS) criteria, a senior chest physician (J.H.D.) classified the patients' lung disorders as asthma or COPD, using data of patients' history and pulmonary function results.

Quality of life was assessed with the Sickness Impact Profile (SIP) and the list of daily activities (DAL). The SIP is designed to assess sickness-related behavioral dysfunction. It provides summary scores for physical, psychosocial, and overall behavioral dysfunction, as well as separate scores for 12 categories of activity. The scores are expressed as the percentage of the maximal possible score of dysfunction in that particular category or set of categories. Recently, the SIP has been translated into Dutch. A sample of individuals (N = 291), older than 40 years, from Dutch general
practice population, served as the control group (H.M. Jacobs, Department of Family Medicine, University of Utrecht, The Netherlands, unpublished data).

The DAL, originally developed in the United States, consists of 11 questions concerning activities that are normal for people in good health. The number of responses in the affirmative makes up the DAL score and gives an indication of impairment. Both the SIP and the DAL have been used in several studies on CNSLD.

Statistical Analysis

The significance of differences between participants and nonparticipants was tested using χ² tests and Student's t tests. Since the data of the SIP and the DAL were skewed, the analysis of the relation between somatic parameters and the quality of life was performed on ranked data. An analysis of variance was used for the bivariate analysis of respiratory symptoms vs quality of life. To examine the relation of pulmonary function and diagnosis vs quality of life, partial correlations and analyses of covariance were calculated, controlling for age.

Because SIP data from the Dutch population were available only as summary statistics, we made comparisons between this population and the present population by means of χ² tests and Student's t tests. For the same reason, Student's t tests were used to compare the mean age and the FEV₁ in the IPPB study and in the NOTT study with findings in the present population.

In all analyses, p values below the 5 percent level, two-tailed, were regarded as significant.

Table 1—Characteristics of Patients

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No.</th>
<th>Sex, % M</th>
<th>Age, yr</th>
<th>Current smoker, %</th>
<th>Exsmoker, %</th>
<th>FEV₁, L/s</th>
<th>FEV₁, % predicted</th>
<th>FEV₁/IVC, %</th>
<th>Pulmonary medication, %</th>
<th>Corticosteroids</th>
<th>Treated by chest physician, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70</td>
<td>49</td>
<td>40-84</td>
<td>33</td>
<td>37</td>
<td>0.58-4.45</td>
<td>27.2-118.0</td>
<td>21.0-91.2</td>
<td>26.5-125.1</td>
<td>27%</td>
<td>6%</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

RESULTS

Patients

One hundred twenty-three patients who met the inclusion criteria were identified. Seven patients were excluded because of concomitant disorders; six persons were not invited to participate in the study since it was considered too burdensome for them; one person died before the study began.

In this way, 109 patients were identified as eligible

![Figure 1. Mean Sickness Impact Profile scores for patients (N = 70) and control subjects (N = 291) (Student's t test: *p<0.05; **p<0.01; ***p<0.001).](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21619/)

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for the study, of whom 73 (67 percent) agreed to participate. Sex, diagnosis, and number of referrals to a chest physician did not differ significantly between the participants and nonparticipants. Patients participating in the study were older (t value 3.38, df = 107, p<0.01) and used pulmonary medication more often (χ² 4.25, df = 1, p<0.05) than subjects who did not participate.

Complete quality of life data were available from 70 patients. A selection of demographic and somatic characteristics of these patients is given in Table 1.

A senior chest physician (J.H.D.) judged 26 patients (36 percent) to have asthma and 32 patients (46 percent) to have COPD. For 12 subjects, available data did not allow classification by diagnosis.

**Impairment in Quality of Life in Family Practice**

The SIP responses of patients were compared with the scores of a control sample (N = 291). Patient group and control group did not differ significantly in age (χ² 3.88, df = 2, p<0.25) and sex (χ² 0.60, df = 1, p<0.5). Patients appeared to be significantly more impaired in their overall physical and psychosocial functioning than control subjects (t test and p values, Fig 1) and reported more dysfunction in seven of 12 SIP categories.

As reference material SIP scores of control subjects, the present population, patients in the IPPB study, and the NOTT population are summarized (Table 2). The outpatients in the IPPB trial exhibited significantly lower values of FEV₁ (mean ± SD, 1.10 ± 0.40 L/s) than patients in family practice (t value 7.50, df = 168, p<0.001). Patients in the NOTT group suffered even more severe degrees of CNSLD, as indicated by their FEV₁ (mean ± SD, 0.75 ± 0.35 L/s). Between the present population and the IPPB population, no differences in age were found. The mean (± SD) age of the patients in the NOTT (65.5 ± 8.3 years) was higher than the mean age of the present patient group (t value 2.75, df = 271, p<0.01). Table 2 reveals substantial differences in SIP scores. Our patients in family practice with an average severity of CNSLD were found to be less impaired than subjects in the IPPB study and NOTT.

### Table 2—Mean Sickness Impact Profile Scores for Control Subjects (Unpublished Data), Patients in family practice, Patients in the IPPB study, and Patients in the NOTT study

<table>
<thead>
<tr>
<th></th>
<th>SIP Overall %</th>
<th>SIP Physical %</th>
<th>SIP Psychosocial %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group (N = 291)</td>
<td>4.3</td>
<td>3.6</td>
<td>3.8</td>
</tr>
<tr>
<td>Family practice (N = 70)</td>
<td>6.8</td>
<td>5.6</td>
<td>6.4</td>
</tr>
<tr>
<td>IPPB (N = 100)</td>
<td>17.6</td>
<td>11.5</td>
<td>18.1</td>
</tr>
<tr>
<td>NOTT (N = 203)</td>
<td>24</td>
<td>20</td>
<td>22</td>
</tr>
</tbody>
</table>

Patient responses on the DAL are presented in Table 3. The questions are ranked in order of the percentage of affirmative responses. The mean ± SD DAL score was 2.9 ± 2.6. Seventy-seven percent of the study population gave one or more affirmative answers, while in a study of healthy Dutch blood donors, only 11 percent did.

### Table 3—Percentage of Patient Responses in the Affirmative on the List of Daily Activities Questions (N = 70)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Affirmative Responses %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you need help with eating, dressing, bathing, or using the lavatory because of your health?</td>
<td>3</td>
</tr>
<tr>
<td>Are you in bed or a chair for most or all of the day because of your health?</td>
<td>4</td>
</tr>
<tr>
<td>When you travel around in your community, does someone have to assist you because of your health?</td>
<td>7</td>
</tr>
<tr>
<td>Do you have to stay indoors most or all of the day because of your health?</td>
<td>10</td>
</tr>
<tr>
<td>Does your health keep you from working at a job or doing work around the house?</td>
<td>10</td>
</tr>
<tr>
<td>Are you unable to do certain kinds or amounts of work or housework or do you have to work part-time because of your health?</td>
<td>22</td>
</tr>
<tr>
<td>Do you have any trouble either walking one block or climbing one flight of stairs (without shopping bags) because of your health?</td>
<td>26</td>
</tr>
<tr>
<td>Do you have trouble bending, lifting, or stooping because of your health?</td>
<td>33</td>
</tr>
<tr>
<td>Does your health limit you in any way from doing anything you want to do?</td>
<td>41</td>
</tr>
<tr>
<td>Does your health limit the kind of vigorous activities you can do, such as running or lifting heavy objects?</td>
<td>66</td>
</tr>
<tr>
<td>Do you have any trouble either walking several blocks or climbing a few flights of stairs (without shopping bags), because of your health?</td>
<td>67</td>
</tr>
</tbody>
</table>

### Somatic Condition and Quality of Life

The relationship between the somatic condition of patients and their quality of life was examined. Somatic condition was described in terms of respiratory symptoms, pulmonary function, and diagnosis.

Patients with a chronic cough and/or sputum production showed increased dysfunctioning according to the DAL, not according to the SIP. The occurrence of wheeze was positively related to the degree in which patients were impaired in their functioning. A history of one or more asthma attacks appeared not to be related to the quality of life. Significant connections were found between the degree of dyspnea and the SIP and DAL scores: patients who were more dyspneic reported more restrictions in their functioning (Table 4).

Except for the absolute FEV₁ (L/s), no significant relationships were found between the spirometric data and the SIP results, when controlling for age. The
DAL scores were related to several lung function parameters (Table 4).

The impact of the diagnosis on the quality of life was examined using an analysis of covariance procedure. Age was specified as a covariate. The results revealed that patients with COPD were more impaired in their daily functioning as assessed with the DAL than patients with asthma (F value 7.21, df = 1, p = 0.01). The same tendency was found with regard to the SIP overall score (F value 3.47, df = 1, p = 0.068).

**Discussion**

The patients in this study represent the broad range of degrees of severity of disease found in family practice, as shown by, for instance, their pulmonary function results (Table 1). Both patients with asthma and patients with COPD are included in the present population. We have chosen selection criteria for which no technical equipment is needed in order to enable the family physician to copy our patient selection in his daily work. Therefore, we have not laid down inclusion criteria regarding lung function, since spirometric equipment is not usually available in family practice.

Since data on quality of life from reference groups were available, we have not added a control group to our study population. Statistical comparison revealed no significant differences in age and sex between the patient population and the SIP reference group from Dutch general practice. However, as a matched control sample is lacking in our study design, we communicate our results with some reservation.

In previous studies, quality of life has been found to be diminished in outpatients and hospitalized patients with CNSLD.25,27 Our results reveal that patients in family practice, too, are limited in physical and psychosocial functioning. On the physical, psychosocial, and the overall SIP score, our patients differed significantly from control subjects (Fig 1). They appeared to be particularly affected in the fields of sleep and rest, ambulation, communication, and emotional behavior. This diversity of dimensions illustrates the broad impact CNSLD has on patients' quality of life. The results of the DAL also indicate that patients are impaired in daily functioning (Table 3). One quarter of the patients, for example, reported having trouble either walking one block or climbing one flight of stairs.

As might be expected, patients in family practice are less impaired in their quality of life than outpatients and hospitalized patients as shown by, for instance, the results of the IPPB trial and the NOTT study (Table 2). To rate the impairment in quality of life of the present population at its true value, it is important to note that the highest score of dysfunction obtained by the hypoxemic patients in the NOTT study is 24 percent.

The SIP and the DAL were related to wheezing and to the degree of dyspnea (Table 4), which is consistent with findings in other studies.24,26 Dyspnea showed an especially strong relation with the quality of life measurements, which is an indication of the substantial impact dyspnea has on patients' daily life. However, one methodologic pitfall deserves attention. Sometimes similar expressions have been used to assess the severity of dyspnea (a respiratory symptom) as well as to measure the degree of physical impairments in patients' functioning (their quality of life). This causes an overestimation of the strength of the relationship between dyspnea and quality of life. Guyatt et al27 even consider dyspnea in patients with chronic airflow limitation as a dimension of quality of life itself. Yet, in our study, we have used a definition of quality of life as "normal physical, psychologic and social functioning," which is similar to definitions used by other investigators in this field4,5,9 and encompasses

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**Table 4—Relationship of Respiratory Symptoms and Pulmonary Function to SIP and DAL (N = 70)**

<table>
<thead>
<tr>
<th>Symptoms/Pulmonary Function</th>
<th>SIP Overall</th>
<th>SIP Physical</th>
<th>SIP Psychosocial</th>
<th>DAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic cough and/or expectoration</td>
<td>2.23</td>
<td>1.26</td>
<td>1.14</td>
<td>6.87†</td>
</tr>
<tr>
<td>Wheezing</td>
<td>11.25‡</td>
<td>3.43</td>
<td>13.19‡</td>
<td>8.23‡</td>
</tr>
<tr>
<td>Ever asthma attack</td>
<td>0.59</td>
<td>2.43</td>
<td>0.10</td>
<td>0.52</td>
</tr>
<tr>
<td>Degree of dyspnea</td>
<td>8.14§</td>
<td>7.16§</td>
<td>5.07‡</td>
<td>15.57§</td>
</tr>
</tbody>
</table>

FEV₁, L/s: $-0.29^{†}$ $-0.26^{†}$ $-0.18$ $-0.46^{§}$

FEV₁% predicted: $-0.17$ $-0.12$ $-0.05$ $-0.31^{‡}$

FEV₁/IVC, %: $-0.12$ $-0.10$ $-0.05$ $-0.24^{‡}$

FEV₁/IVC, % predicted: $-0.11$ $-0.10$ $-0.05$ $-0.24^{‡}$

*Respiratory symptoms: analysis of variance F value on ranked data; cough/expectoration, wheezing, asthma: df = 1; dyspnea: df = 4. Pulmonary function: partial correlation coefficient on ranked data, controlling for age. SIP = Sickness Impact Profile; DAL = list of daily activities.

†p<0.05.

‡p<0.01.

§p<0.001.

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the aspects of health defined by the World Health Organization (WHO).26 Since these definitions do not encompass symptoms as an aspect of quality of life, we believe dyspnea should not be considered as a part of it either.

A major finding in our study concerns the fact that pulmonary function is hardly related to the SIP scores in this patient population (Table 4). As the broad range of pulmonary function in our subjects increases the likelihood of high correlations, this finding is all the more striking. As the DAL mainly reflects patients' physical condition, it is connected with patients' lung function. In studies on clinical outpatients, the relation between pulmonary function and quality of life has also been shown to be weak.3,4,7,9 On the other hand, when comparing the SIP scores of patient populations with different degrees of severity of disease (Table 2), it becomes clear that the somatic condition of these populations influences their quality of life. Although patient populations differ in quality of life, we conclude that for the individual patient, other factors moderate the effects of lung function on his daily functioning.

The difference in quality of life in patients with a diagnosis of asthma and with a diagnosis of COPD is interesting. It can be hypothesized that the continuous nature of COPD accounts for the extensive impact of this disease on daily functioning. As there is hardly any literature on quality of life in asthma and on differences in this respect between patients with asthma and patients with COPD, this matter needs further clarification.

We conclude that CNSLD affects the quality of life of elderly patients in family practice. The impairments in daily functioning, both physical as well as psychosocial, are only partly related to patients' somatic condition. Therefore, limitations in daily functioning might be explained by psychologic and/or sociologic factors. Previous studies have indicated that psychologic factors predict CNSLD patients' functioning2,7,8,9 and use of emergency care.30 Sociologic characteristics have also been shown to influence the quality of life.1,4,5,21

For these reasons, it seems necessary that interventions aimed at improving patients' quality of life should encompass psychosocial interventions as well as somatic care. In earlier research, the effectiveness of psychosocial interventions has been demonstrated.2,31-33 We do not believe this to be the exclusive task of psychologists. On the contrary, family physicians and chest physicians seem eminently competent to integrate psychosocial and somatic care for elderly patients with CNSLD.

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