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ORIGINAL ARTICLE

Is the treatment of acute COPD exacerbations in Finland shifting to general practitioners?

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Abstract

Objective. To examine changes in the numbers of inpatient episodes and inpatient days and length of stay in acute exacerbations of COPD (chronic obstructive pulmonary disease) by specialization and by age group and sex distribution relative to the total population in the years 1995–2001. *Design*. A register-based study. *Subjects*. Data on inpatient episodes for patients aged 45 years or over with a principal diagnosis of COPD beginning in 1995–2001 and lasting less than 90 days were extracted from the hospital discharge register of the Finnish National Research and Development Centre for Welfare and Health. *Main outcome measures*. Numbers of inpatient episodes and days by age and sex in the specialities of general practice, pulmonary medicine, and internal medicine. *Results*. The annual number of inpatient episodes increased by 10.9% from 1995 to 2001. The number of emergency treatment episodes supervised by a general practitioner increased by 36.8% during the same period and the number of such episodes supervised by a pulmonary specialist by 17.8%. The increase in age-adjusted emergency treatment episodes for men was 0.8% and that for women 18.5%. The average hospital stay shortened from 8.0 (SD 8.0) to 6.5 (SD 6.2) for men and from 8.7 (SD 8.5) to 7.3 (SD 6.8) for women. *Conclusions*. The greater increase in inpatient episodes for exacerbations of COPD in relation to the total population among women than among men may be attributed to differences in smoking habits and ageing between the sexes. Responsibility for COPD cases is clearly shifting to general practitioners. This is due partly to the national programme for the treatment of obstructive pulmonary diseases and the associated in-service training provided for general practitioners and partly to financial reasons. More detailed investigations should be made into the quality of the treatment.

Key Words: *Chronic obstructive pulmonary disease, general practice, general practitioner, hospitalization*

COPD (chronic obstructive pulmonary disease) is a worldwide problem that causes considerable human suffering and economic burdens [1], with hospitalization and emergency room treatment accounting for 73% of the total costs involved [2]. The total expenditure attributable to COPD in Sweden in 1999 was approximately a thousand million euros [3]. The prevalence of the disease among elderly Finns is 12.5% for men and 3% for women [4].

The primary healthcare service provided by 431 local authorities forms the backbone of the Finnish public healthcare system. The local authorities, either alone or jointly, provide primary healthcare services for their citizens at a total of 257 health centres, while 20 larger hospital districts composed of local authorities are responsible for providing

COPD causes repeated hospitalizations.

- The increase in age-adjusted inpatient episodes for men was 0.8% and that for women 18.5% in 1995–2001.
- General practitioners supervised 30.9% of all inpatient episodes for exacerbations of COPD in 1995, while the corresponding percentage was 38.1% in 2001.
- The quality of inpatient episodes should be examined in more detail, especially as regards referral for further treatment, repeated inpatient episodes, and possible differences in mortality following treatment supervised by a general practitioner.

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specialized healthcare. The primary healthcare system also includes health centre inpatient wards managed by general practitioners, who have traditionally been assigned a gatekeeper role with regard to health service costs, although the role of a coordinator might be more appropriate [5]. The Finnish healthcare system departs markedly from those in many other European countries [6], the basic principle being that the patient seeks help initially from the primary healthcare service and is referred for specialist care as required. Nevertheless, if patients do report initially to a specialized unit, their state of health must be evaluated and the appropriate place of treatment decided upon, including direct admission to hospital if necessary. These principles were valid throughout the period studied here. The local authorities are now in the process of moving over to the population responsibility system in which a general practitioner has responsibility for 1500–2500 inhabitants without any specific office hours. In some municipalities general practitioners work regular office hours (37/week). General practitioners tend to prefer this new system to the traditional one in terms of quality, although the distinction does not seem to affect patient satisfaction [7]. Of the physicians working in primary healthcare in 2001, 34% had completed the six-year programme of specialization in general practice [8]. There are considerable challenges facing this system [9]. About 95% of a district's patients will be treated by general practitioners without any referral note [10], and many investigations have shown that it is precisely referrals that contribute most to local authority health costs [11,12]. The cost of a day's treatment for exacerbation of COPD is about twofold in a specialized hospital ward compared with the inpatient ward of a health centre [13]. There are many factors that influence the numbers of referrals, probably the most significant ones being consultations within the health centre and with specialists [14].

The aim here was to study exacerbations of COPD that are treated initially in an emergency room and result in hospitalization, in order to ascertain the changes in the numbers of inpatient episodes and inpatient days and in the duration of inpatient treatment by specialization, sex, and age group in the years 1995–2001.

Material and methods

The data were extracted from the hospital discharge register maintained by the Finnish National Research and Development Centre for Welfare and Health. All inpatient episodes for patients aged 45 years or over with a principal diagnosis of COPD (ICD 9, International Classification of Diseases, codes 491, 492, and 496; ICD 10, codes J41–J44) beginning in 1995–2001 and lasting less than 90 days were included. Particular attention was paid to inpatient episodes of acute exacerbations of this disease. The survey concentrated on the first place of treatment, i.e. the inpatient episodes following the acute exacerbation stage were not included.

The resulting number of inpatient episodes was 56,069, of which 99.4% took place in departments managed by a general practitioner, an internist, or a pulmonary specialist. Only cases treated by such physicians were included in the analysis. The patients were divided into four age groups: under 65 years, 65–74 years, 75–84 years, and 85 years or over. The changes in the number and duration of inpatient episodes were expressed in relation to the total population (per 1000 persons).

In addition to personal details and diagnoses, this register contains information on the specializations responsible for providing treatment in each case, the manner of admission, the source of referral and the institution from which the patient was referred. The discharge data indicate the need for further treatment, the place to which the patient was sent for this treatment and death occurring during hospitalization. Periods recorded as beginning and ending on the same date were counted as one inpatient day. The resulting database was analysed using the SPSS for Windows 10.1.3 software package (SPSS Inc.), and statistical differences between groups were assessed with the t-test for independent samples, taking $p < 0.05$ as the level of significance.

Results

Inpatient episodes

A total of 21,238 patients with exacerbations of COPD identified from the register underwent a total of 55,728 inpatient episodes in the years 1995–2001. These periods increased by 10.9% from 1995 to 2001. The number of inpatient episodes supervised by a general practitioner increased by 36.8% and the number supervised by a pulmonary specialist by 17.8%, whereas the number of episodes managed by an internist decreased by 22.3% (Figure 1).

The increase in age-adjusted inpatient episodes for men was 0.8% and that for women 18.5%. The number for men aged 65–74 years decreased by 21.0% and that for women of the same age by 4.7%. In the other age groups the numbers of inpatient episodes increased (Figure 2).

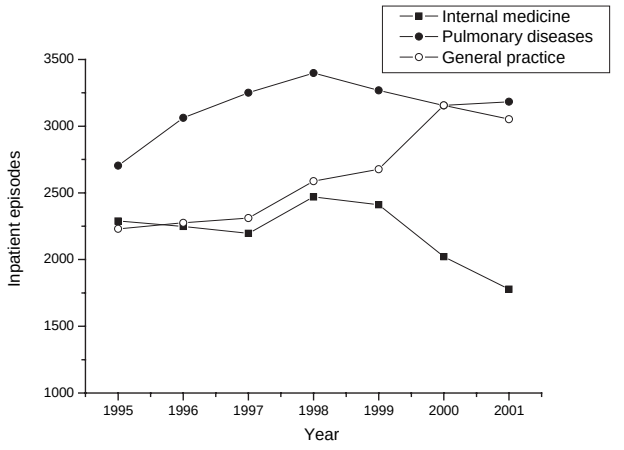

Figure 1. Inpatient episodes for acute exacerbations of COPD, by specialities, 1995–2001.

Inpatient days

The emergency treatment episodes comprised a total of 419,884 days and decreased by 8.5% from 1995 to 2001. The number of inpatient days managed by a general practitioner increased by 25.8% during the same period, whereas that managed by a pulmonary specialist decreased by 17.9% and that managed by an internist by 32.4%.

The number of age-adjusted inpatient days for men in 1995 was 43,629, from which the figure dropped by 19.6% by 2001, and that for women was 15,345 in 1995 and dropped by 0.2% by 2001.

Duration of treatment

The mean length of inpatient episodes over the years 1995–2001 was 7.3 days (SD 7.1) for men and 8.1 (SD 7.7) for women, which is a significant difference ($p < 0.001$). The figure declined from 8.0 days (SD 8.0) in 1995 to 6.5 days (SD 6.2) in 2001 among the men and from 8.7 days (SD 8.5) to 7.3 days (SD 6.8) among the women. This change was statistically significant for both sexes ($p < 0.001$).

The inpatient episodes supervised by general practitioners shortened from 7.9 days (SD 8.5) to 7.3 days (SD 7.8) during the same period (Figure 3). These changes in duration were again statistically significant ($p = 0.005$ for general practitioners and $p < 0.001$ for pulmonary specialists and internists).

Age and sex

The mean age of the men treated by a general practitioner was 73.9 years (SD 8.3) and that of the women 74.6 years (SD 9.3), with corresponding figures of 71.1 (SD 8.3) and 70.2 (SD 9.0) years for those treated by a pulmonary specialist and 72.1 (SD 8.5) and 72.1 (SD 9.3) years for those treated by an internist.

Of the inpatient episodes of the women, a general practitioner was responsible for 22.3% in 1995 and 36.6% in 2001 and a pulmonary specialist for 41.1% and 41.6%, respectively.

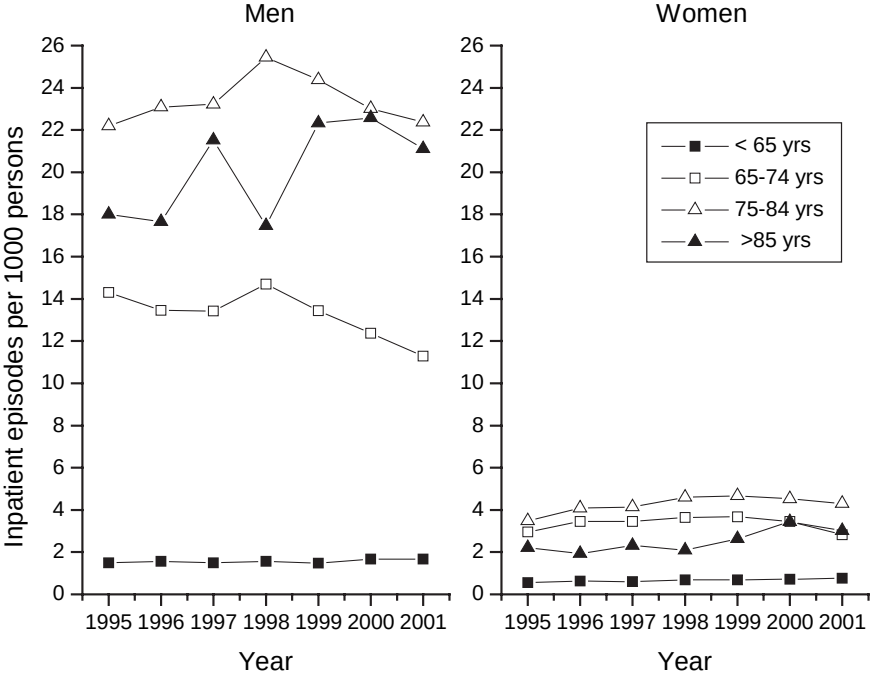

Figure 2. Age-adjusted inpatient episodes for acute exacerbations of COPD, by age group, among men (left) and women (right), 1995–2001.

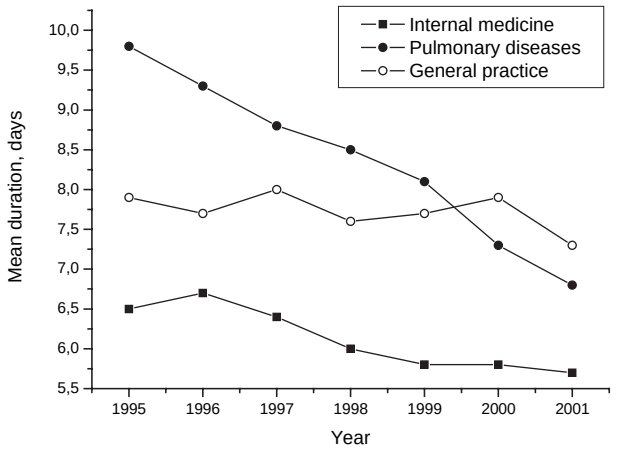

Figure 3. Mean duration of inpatient episodes for acute exacerbations of COPD, by specialities, 1995– 2001.

Discussion

Although the number of inpatient episodes for exacerbation of COPD beginning with admission to an emergency room and resulting in hospitalization increased over the years, the episodes became shorter and the number of inpatient days decreased due to improvements in treatment. At the same time, there was a noticeable shift of responsibility towards general practitioners.

The hospital discharge data can be regarded as reliable. Keskimäki & Aro [15] have shown that the dates of admission and discharge are entirely correct for 96% of inpatient episodes and the principal diagnoses are correct to an accuracy of three digits for 94.1% of respiratory patients. A similar result was also obtained by Pajunen et al. when comparing entries in this register with those in the register of cardiovascular diseases [16]. The diagnoses of COPD made within the Finnish healthcare system can certainly be regarded as reliable, as they are made mainly by pulmonary specialists for the purpose of entitling patients to reimbursement of their medication costs.

Although the number of emergency room admissions for acute exacerbations of COPD increased among both men and women during the study period, the trend was more marked among the women, presumably mainly on account of the change in smoking habits, as smoking is the major risk factor for COPD and exerts its effect with a delay of several decades. The number of Finnish women who smoke has doubled over the last 50 years, while that of men has decreased to a third of what it once was. Thus, by 1999, 30% of adult males and 20% of females in Finland smoked. In addition, female smokers may be more susceptible to the development of COPD than men [17]. On the other hand, although smoking among men in Finland has decreased, the number of inpatient episodes for acute exacerbations of COPD increased during the study period. The reason may lie in the ageing of the population. While there were 90,606 men aged over 75 years in Finland in 1995, the figure was 22.6% higher in 2001. The number of women in this age group increased by 13.9% over the same period.

The marked increase in the number of inpatient episodes supervised by a general practitioner from 1998 onwards and the corresponding decline in the episodes supervised by specialists points to a distinct shift of responsibility for such treatment to general practitioners. This is probably due to their improved capacity for managing acute exacerbations of COPD based on the national guidelines for the prevention and treatment of this disease issued in 1998 [18] and the associated training for health centre physicians in the treatment of COPD.

Inpatient episodes for both sexes and within all specialities tended to become shorter during the study period. This effect was most noticeable among pulmonary specialists, in spite of the fact that they usually deal with the most serious cases. This may be explained by the recent changes in treatment methods, especially the increased use of non-invasive ventilation techniques, which have been shown to reduce treatment times for severe exacerbation [19]. In addition, the number of beds in municipal hospitals was reduced by 16.0% over the years in question [20], which forced the staff to adopt more efficient treatment methods.

It is notable that women had a longer duration of inpatient episodes than men in all age groups and specialities, in spite of their greater readiness to seek treatment, as observed previously at least in the case of asthma [21], which would tend to give them shorter periods of treatment than for men. The general shortening of the duration of inpatient treatment meant that the number of inpatient days decreased during the study period, even though the number of inpatient episodes increased.

There were distinct differences in age between the patients managed by the different specialities, those seen by general practitioners being the oldest and those seen by pulmonary specialists the youngest. One explanation for this is that a diagnosis of COPD is usually made by a pulmonary specialist, and this can take place during the treatment that follows an acute exacerbation, whereas patients who are already diagnosed as having COPD tend to be treated by a general practitioner.

The relative increase in the percentage of female patients seen by a general practitioner over the study period can also be explained by the fact that women are more demanding about their treatment [21]. In fact, therefore, the difference between the sexes may

have levelled off as general practitioners received further training in the management of COPD under the auspices of the national programme.

Responsibility for the treatment of exacerbations of COPD is clearly shifting to general practitioners, partly on account of the national programme for the treatment of obstructive pulmonary diseases and the associated in-service training provided for general practitioners and partly for financial reasons. Further analyses should be made of inpatient episodes supervised by general practitioners, particularly with regard to the quality of treatment, referral for further treatment, repeated inpatient episodes and possible differences in mortality.

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