LONG-TERM HOSPITAL TREATMENT FOR PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Lampela P.[1], Säynäjäkangas O.[2], Keistinen T.[3],

[1]Department of Public Health Science and General Practice, University of Oulu, and Rovaniemi Health Center, Rovaniemi

[2]Lapland Central Hospital, Department of Pulmonary Diseases, Rovaniemi

[3]Department of Public Health Science and General Practice, University of Oulu, and Vaasa Health Care Region Vaasa, Finland

SUMMARY

The aim of this study is to describe the long-term hospital treatment provided for chronic obstructive pulmonary disease (COPD) patients in Finland in 1972-2001 and changes over that period. Data on all treatment periods for persons aged over 45 years with a primary or secondary diagnosis of COPD (International Classification of Diseases – ICD 8: 491 and 492, ICD 9: 491, 492 and 496, ICD 10: J41-J44) beginning in the years 1972-2001 were gathered from the treatment register of the Finnish National Research and Development Centre for Welfare and Health and examined particularly with respect to long treatment periods (over 90 days).

A total of 10,176 long treatment periods were recorded as having begun during the years in question. The number of treatment periods for men dropped by 65.8% over the time interval 1972-2001, while that for women increased by 4.7%. The number of treatment periods in university and central hospitals dropped by 97.6%. The total number of hospitalization days in the long treatment periods over the years 1972-2001 was 3,844,521, the men accounting for 82.9% in 1972-1976 and 67.3% in 1997-2001. The number of days required by men dropped by 82.1% and that for women by 57.8%. The number of days in university and central hospitals decreased by 98.4%, and that in health centre hospitals by 47.6%.

COPD is a cause of repeated hospitalization, but it less and less often leads to long-term hospital treatment nowadays. The number of treatment days required for men has fallen more rapidly than that for women, and both the lengths and numbers of treatment periods have decreased at all levels of hospital, although with a tendency for treatment to be concentrated nowadays in the health centre hospitals. Long-term treatment for COPD has virtually disappeared from the sphere of specialized health care. The trends observed here are attributable to marked changes in the structure of the health service, with more accent being placed on open care, and a decrease in the numbers of male smokers.

Key words: chronic obstructive pulmonary disease (COPD), long-term care, hospital, open care, service structure, smoking

Address for correspondence: Pekka Lampela, Kivikaudentie 19, FIN-96400 Rovaniemi, Finland. E-mail: pekka.lampela@rova.fimnet.fi

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is one of the most significant causes of morbidity and mortality worldwide, imposing a serious human and economic burden on individuals and society (1). Some 68% of the costs involved arise from treatment in hospital (2). The prevalence of COPD is on the increase, and is at present 12.5% in Finnish men and 3% in women (3). Numerous factors have been shown to influence the need for long-term institutional care on account of COPD, some of which are due to functional deficits while others are demographic, social or attitudinal in character. These include advanced age, living alone, the use of appliances for moving about, the need for help in everyday instrumental functions and psychological incapacitation (4). On the other hand, many investigations have shown that some patients in institutional care need less help than many of those living at home (5–7). In view of the dearth of published work on long-term treatment for COPD, we report here on the situation in Finland in this respect and changes observed over the period 1972–2001.

MATERIAL AND METHODS

Data were gathered on all periods of hospital treatment for patients with a primary or secondary diagnosis of COPD [International Classification of Diseases (ICD) 8: 491 and 492, ICD 9: 491, 492 and 496, ICD 10: J41–J44] recorded in the treatment register maintained by the National Research and Development Centre for Welfare and Health in Finland that began in the years 1972–2001 and lasted at least 90 days. The resulting data set was analysed using SPSS for Windows 10.1.3 (SPSS Inc.). Statistical significance was assessed with the t-test for independent groups.

Treatment of this duration is regarded under the National Health Insurance Act as continuous institutional care for the purpose of determining payment and the benefits available to the patient (8). The demographic data and forecasts were based on information from Statistics Finland. The total population of Finland in 2001 was 5.1 million. For the present purpose the university hospitals and other central hospitals, including hospitals for respiratory diseases, are regarded as forming one level in the health system and approved hospital wards in old people's homes, local hospitals and those attached to health centres as a second level. A third category of "other hospitals" is recognised that in-

Table 1. Numbers of long treatment periods (N) recorded in 1972–2001 and mean numbers of treatment days in hospitals at different levels

	University and central hospitals		Health centre hospitals		Other hospitals	
	N	Mean (SD) treatment days	N	Mean (SD) treatment days	N	Mean (SD) treatment days
1972-1976	902	221 (360)	774	460 (709)	478	830 (1070)
1977-1981	617	216 (276)	1,118	435 (567)	405	702 (886)
1982-1986	611	199 (205)	1,177	420 (526)	352	537 (595)
1987-1991	301	218 (231)	1,075	394 (439)	264	344 (341)
1992-1996	103	186 (271)	964	349 (383)	101	386 (444)
1997-2001	22	143 (78)	833	224 (190)	78	260 (228)

cludes psychiatric hospitals, prison hospitals, regional and military hospitals and institutions for the mentally handicapped.

RESULTS

Treatment Periods

A total of 10,176 treatment periods lasting at least 90 days were recorded in 1972–2001, accounting for 18% of all treatment periods with a primary or secondary diagnosis of COPD during those years. The mean age of the men on the commencement of treatment was 67.0 (SD±9.5) years in 1972–1976 and 76.6 (SD±8.6) years in 1997–2001, the corresponding figures for women being 71.7 (SD±11.0) and 77.8 (SD±9.2) years. Men accounted for 87.0% of the treatment periods in 1972–1976 and 68.7% in 1997–2001. Substantial changes in the age structure of the patient population may be said to have taken place in the interval 1972–2001 (Fig. 1).

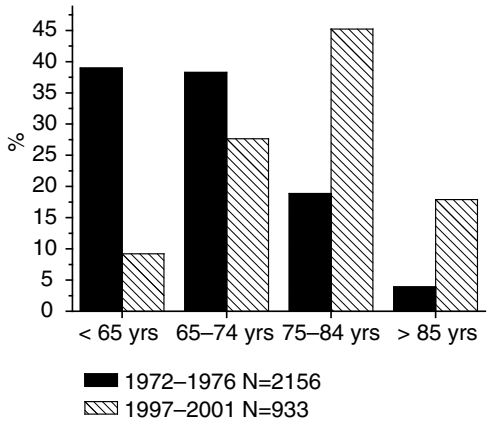

Fig. 1. Changes in age structure of COPD patients between the periods 1972-1976 and 1997-2001.

The same may also be said of the numbers of treatment periods, as 1875 such periods for men were recorded in the years 1972–1976 but only 641 in 1996–2001, a decline of 65.8%, while the figures for women were 279 and 292, respectively, an increase of 4.7%. The most pronounced decrease for men was in the age group under 65 years, 92.8%, and treatment periods among women also decreased in this age group, by 58.7% (Fig. 2).

The number of treatment periods in university and other central hospitals declined by 97.6% over the period in question, and the average numbers of treatment periods in "other hospitals" also declined more markedly than that in health centre hospitals (Table 1), so that the proportion of treatment periods taking place in the latter increased from 35.9% in 1972–1976 to 89.3% in 1997–2001. The mean lengths of the treatment periods for men were 421 (SD±710) days in 1972–1976 and 220 (SD±186) days in 1997–2001, and the corresponding figures for women 582 (SD±881) and 235 (SD±207). The mean length of treatment pe-

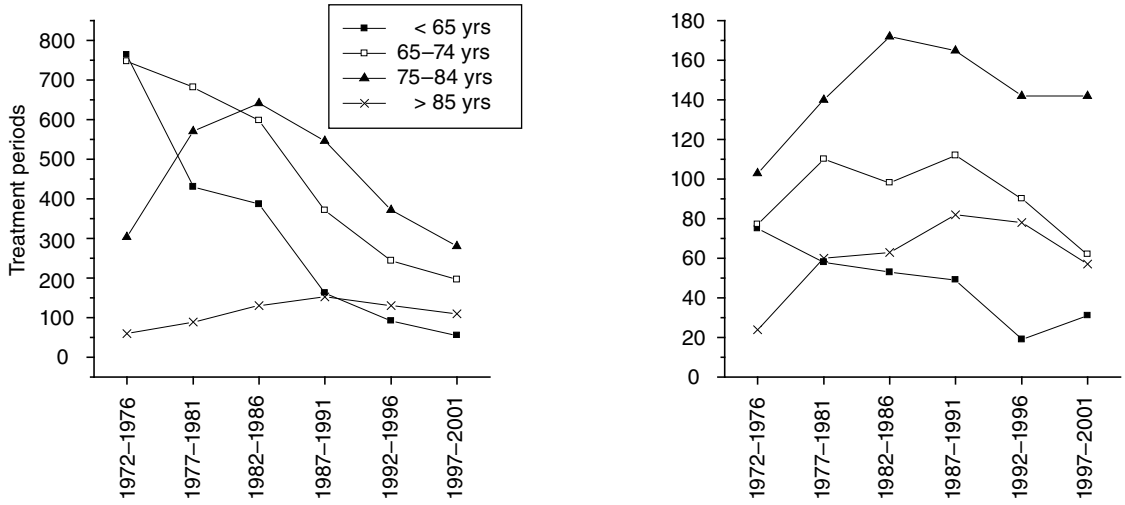

Fig. 2. Numbers of long treatment periods for males (left) and females (right) by age group and five-year period of their commencement, over the interval 1972–2001.

Table 2. *Treatment days for COPD at different hospital levels by five year periods of their commencement, over the interval 1972-2001*

	University and central hospitals Treatment days	Health centre hospitals Treatment days	Other hospitals Treatment days
1972-1976	199,251	355,781	396,957
1977-1981	133,121	485,825	284,443
1982-1986	121,750	494,201	189,011
1987-1991	65,608	423,830	90,751
1992-1996	19,154	335,968	38,959
1997-2001	3,150	186,354	20,251

riod decreased to a much more marked degree among the women than among the men, so that there was no longer a statistically significant difference between them after 1992 (t-test, P=0.42 1992–1996 and P=0.28 1997–2001).

Numbers of Treatment Days

A total of 3,844,521 hospitalization days were recorded in connection with the long-term treatment of COPD in 1972–2001, amounting to 39.6% of all treatment days with this as a primary or secondary diagnosis. The number in 1972–1976 was 951,989 and that in 1997–2001 was 209,755, a decrease of 78.0%. The corresponding decrease in total treatment days for COPD was 45.5%.

Men accounted for 82.9% of the long-term treatment days in 1972–1976 and 67.3% in 1997–2001, the decrease in their number of treatment days being more pronounced than for the women, from 789,625 in 1972–1976 to 141,168 in 1996–2001, or 82.1%, while the number for women dropped from 162,364 to 68,587, or 57.8%. Thus where men had 4.9 times as many long-term treatment days for COPD in 1972–1976 as women, the ratio had narrowed 20 years later to 2.1. The most pronounced decrease was in the number of treatment days for the age group under 65 years, by 96.9% for the men and 82.0% for the women (Fig. 3).

The number of treatment days in university or central hospitals decreased by 98.4% over the interval 1972–2001 (Table 2), that in the group of ”other hospitals” by 94.9% and that in health centre hospitals by 47.6%. Thus the number of days of specialist care declined more markedly than that of basic care and the contribution of the health centre hospitals gained in importance, i.e. where these hospitals accounted for 37.4% of the hospitalization days at the beginning of the period studied, the figure was 88.8% by the end.

DISCUSSION

The hospital treatment statistics may be regarded as reliable. In the assessment carried out by Keskimäki (9) the dates of admittance and discharge were both shown to be recorded correctly in 96% of cases. The primary diagnosis was indicated correctly to an accuracy of three digits in 94.1% of cases of respiratory diseases, and the accuracy of the second and third diagnoses was 76%. One factor that may have affected the results is that three versions of the ICD were in use during the period in question.

COPD creates a need for repeated hospitalization, but nowadays less and less frequently leads to long-term hospital treatment. The number of treatment days required has diminished more rapidly in men than in women, and treatment periods have become shorter and their numbers fallen at all levels of hospital, although with a tendency for the remaining treatment periods to be concentrated in the health centre hospitals. The long-term treatment of COPD has virtually disappeared from specialized hospital care.

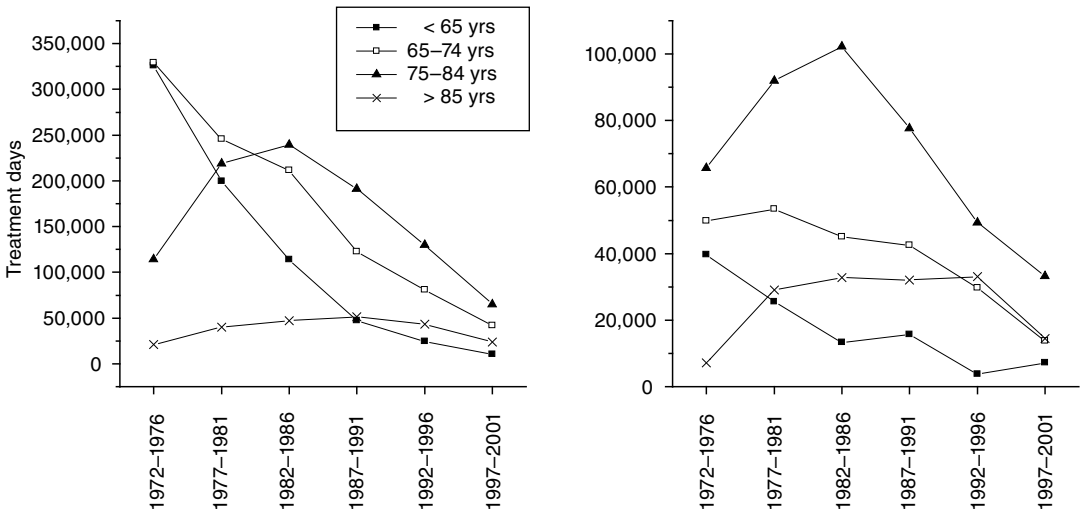

Fig. 3. *Treatment days for males (left) and females (right) by age group and five-year period of their commencement, over the interval 1972-2001.*

Finnish health care has been regarded as heavily institutionalized, and it was only in the 1980's that strategic decisions were made to develop open care facilities and to reduce institutional care (10,11). Thus the numbers of hospital places decreased from 12.4 beds per 1000 inhabitants in 1986 to 8.3 per 1000 in 2000 (12). Correspondingly, the number of days of long-term treatment provided for somatic diseases declined by 97% between 1988 and 1996, while a corresponding rise of 22% occurred in the number provided in health centre hospitals (13). The use of sheltered homes by the chronically ill increased dramatically in the 1990's, while the services provided for people living at home were cutback, and targeted people who were less able to manage by themselves (14). In fact, the most pronounced decreases in numbers of treatment periods and hospitalization days took place in conjunction with this change.

The age structure of the population also altered markedly over the period examined here, so that where 27.7% of males were over 45 years of age in 1972, the proportion was 39.9% in 2001, the corresponding figures for females being 35.0 % and 44.9 %. Similarly, life expectancy increased by 6.1 years for men, to 74.6 years, and by 4.3 years for women, to 81.5 years (12). The total number of days of long-term treatment for COPD nevertheless decreased over the same period, in spite of this change in age structure.

The main risk factor for COPD is smoking, which has approximately doubled in frequency among women over the last 50 years, so that nowadays about 20% of all women are smokers, whereas it has decreased among men, to slightly under 30% (15). These changes in smoking habits are reflected in the results, in that the number of hospitalization days for men declined more markedly than that for women over the period studied here, the trend among the women presumably being held back by their increased smoking. There are also some indications that female smokers may develop COPD more readily than male smokers (16).

Oxygen therapy, which was commenced in Finland in the early 1980's, has undoubtedly made it easier to treat patients while they are living at home. A survey carried out in 1993 showed that there were about 1000 patients in Finland receiving oxygen therapy, 97% of whom were breathing it through an oxygen enricher (17), and 75% of these had COPD. The disease as such is regarded as being resistant to treatment, and the changes that have taken place in the medication available cannot in themselves be held to explain the change in the pattern of institutional care, even though recent results obtained with a combination of budesonid and formoterol (18) and with tiotropium (19) suggest that these are capable of reducing the number of exacerbations of COPD, and thereby the need for hospitalization, and that they improve lung function.

A similar tendency for a reduction institutional care can probably be demonstrated in the case of many other diseases. At least the reductions in the mean duration of hospitalization periods and the higher ages on admission to long-term institutional care points out that patients are able to cope for longer on the strength of open care. It is also the hope of most elderly people themselves that they will be able to manage at home for as long as possible (14). Although open care is generally regarded as a cheaper alternative for the health service, it should be noted that if an elderly patient has functional difficulties and needs a lot of help this alternative may be equally expensive (20).

It is very likely that the numbers of hospitalization days taken up by long-term treatment for COPD will continue to decline in the future, for both men and women, in spite of major changes in the age structure of the population, and that the decline will continue to be more pronounced for men. On the other hand, quite significant changes in treatment modalities may occur, and the national programmes for the prevention and treatment of chronic bronchitis and COPD (21) may have an impact on the situation, as did the asthma programme (22). The pronounced change in demographic structure in the coming years will nevertheless pose new challenges for the development of treatment strategies with respect to many diseases. Promising experiences have been reported with the "hospital at home" model for the treatment of acute exacerbations of COPD (23), and this strategy may be one factor leading to a further reduction in long-term hospital treatment for patients suffering from COPD or other serious chronic diseases.

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