Age Distribution of Patients treated in Hospital for Chronic Obstructive Pulmonary Disease

SIRKKU VILKMAN, TIMO KEISTINEN, TUILI TUUPONEN, SIRKKA-LIISA KIVELÄ

Summary
A discharge register maintained by the National Research and Development Centre for Welfare and Health was employed to study the use of hospital services, attributable to chronic obstructive pulmonary disease (COPD), in Finland. From a total population of 5 million COPD caused 113,016 hospital treatment periods during 1983–92 of persons aged 35 years or over. In men the need of hospital treatment for COPD started to rise sharply after the age of 50. Men aged 73 had the highest amount of admissions (3962 admissions per 10-year period). Women aged 68 had the highest amount of admissions (802 admissions per 10-year period). The highest admission rate per 1000 inhabitants was found for men at the age of 82 (37.0 admissions per 1000 population/year) and for women at the age of 77 (3.8 admissions per 1000 population/year). During the 10-year period a total of 27,008 new COPD patients aged 35 or over received hospital care. The highest number of new admissions occurred among both sexes at the age of 71 (750 admissions per 10-year period in men and 233 admissions per 10-year period in women). This means that most of admissions are due to elderly COPD patients seeking treatment repeatedly. As the populations in the developed countries are ageing, the significance of COPD for the health care system is growing.

Introduction
Respiratory symptoms are common in older people. In a study of persons aged 65 or over, 28% reported wheeze and 20% reported dyspnoea at rest within the preceding 12-month period [1]. In a recent report the prevalence of lung disease in current smokers aged over 65 was 8% of men and 7% of women with chronic bronchitis and 14% of men and 5% of women with emphysema [2]. It was also noted that undiagnosed airways obstruction was most likely in women and those with lower income, and was associated with current and former smoking.

Chronic obstructive pulmonary disease (COPD) is primarily a smokers’ disease which clusters in families and worsens with increasing age. The disease causes progressive loss of lung function and finally disables the patient. COPD has a long, relatively asymptomatic phase of measurable accelerated decrease in pulmonary function before individuals seek medical attention because of dyspnoea and related symptoms [3]. COPD is usually diagnosed between the ages of 50 and 60 when FEV₁ is 1–1.5 l/s and after COPD has become symptomatic it has a poor prognosis [4].

Mortality and morbidity trends are parallel to smoking prevalence. Smoking rates appear to be levelling off or even decreasing among men in developed countries but among women the rates are increasing. Smoking rates are higher in groups that are most difficult to reach by health information: the unemployed and blue-collar workers, the less educated, and minorities [5]. COPD and malignant neoplasm (especially respiratory cancers) are the only disorders which have shown an increasing trend in age-adjusted and proportionate mortality between 1950 and 1986 in the USA [6]. The fact that mortality rate 10 years after diagnosis of COPD is greater than 50% [4] confirms that COPD is a very serious disorder and a lot of care (also in hospital) is needed by symptomatic COPD patients.

The amount of treatment and care needed by COPD cases will be largely determined by the proportion of the aged population. Whatever happens to the age-adjusted rates of the disease, in Western countries with increasingly aged populations, COPD in all its forms is likely to be a persistent problem for a considerable time to come.

The aim of the present research was to study the age distribution of hospitalized COPD patients. Special attention was paid to those cases who were admitted to hospital during the study period as new COPD patients. We wanted to find out at what age COPD patients needed hospital resources most. These results can be utilized for medical and public health planning purposes.
Materials and Methods
The National Research and Development Centre for Welfare and Health is provided with registration data including diagnoses on all patients treated in hospital in Finland. All treatment periods from 1972 to 1992 for which the main diagnosis was COPD (International Classification of Disease codes 491, 492 in Eighth and Ninth Revision and 496 in Ninth Revision) were collected from the register. Altogether, 211 709 COPD-related treatment periods were recorded between 1972 and 1992.

A COPD patient who had no recorded COPD-related hospital treatment periods between 1972 and 1982 and was first treated in 1983 or later was considered as a new patient. During the study period of 10 years (1983–92) all admissions and new admissions were collected according to age and sex in the population aged 35 or over. The rates of all admissions and new admissions were calculated by sex and age in relation to the total population at the end of each year. At the end of 1992 the total population in Finland was 5 054 982.

The computer files were processed at the Department of Public Health Science and General Practice, University of Oulu. The population data were based on information provided by the Central Statistical Office of Finland.

Results
Treatment periods: Altogether 113 016 hospital treatment periods for COPD were recorded for Finns aged 35 years or over between 1983 and 1992. Most (81.2%) hospital treatment periods were used by men (Figure 1). The proportions of men in different age groups were 70.5% (35–54 years), 82.4% (55–74 years) and 81.6% (75 years or over).

Admissions among men started to rise sharply after the age of 50 years and reached the highest number between 65 and 74 years. Men aged 65–74 years used 33.0% of all treatment periods and 40.6% of treatment periods among men. Admissions among women increased clearly after the age of 50 but the rise was more moderate than in men. The highest number of admissions occurred among women between 65 and 74 years. Women aged 65–74 used 6.7% of all treatment periods and 35.5% of treatment periods in women.

The population-related rate increases with age (Table). The highest age-specific admission rate was found among 82 year-old men (37.0 admissions per 1000 population/year). In women the highest rate was found among those aged 77 (3.78 admissions per 1000 population/year).

New COPD treatment periods: Altogether 27 008 new COPD patients were recorded among Finns 35 years or over between 1983 and 1992. Men comprised 73.8% of these new cases (Figure 2). Most of the new cases of COPD occurred at the age of 71 in both sexes (750 new admissions per 10-year period in men and 233 in women at this age). Men aged 65–74 years generated 25.6% of all new treatment periods and 34.6% of all new treatment periods among men. Women in the same age group used 8.0% of all new treatment periods and 30.5% of all new treatment periods among women.

The proportion of new admissions was 23.9% (21.7% in men and 33.4% in women) among all admissions among 82 year-old men (37.0 admissions per 1000 population/year). In women the highest rate was found among those aged 77 (3.78 admissions per 1000 population/year).

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Figure 1. Hospital treatment periods for COPD during 1983–92 according to age and sex in Finland.

Figure 2. Number of new COPD treatment periods during 1983–92 according to age and sex in Finland.
during the study period 1983–92. This proportion diminished with advancing age; at the age of 35 new admission accounted for 61.4% in men and 72.0% in women while at the age of 75 only 19.6% of admissions were new in men and 29.2% in women.

In both sexes the rate of new COPD cases per 1000 population/year increased with age. The highest age-specific rate in the occurrence of new COPD cases was found among men at the age of 82 years (8.09 new cases per 1000 population/year). In women the highest age-specific rate was found at the age of 89 (1.35 new cases per 1000 population/year).

Discussion

The discharge register maintained by the National Research and Development Centre for Welfare and Health is an extensive one, covering all private, public, general and mental hospitals in Finland. All the hospitalized COPD patients in a whole population during 1983–92 are presented in our results. The reliability and validity of the register information are good [7].

Asthma (ICD code 493) is excluded because asthma and COPD are two different disease entities both aetiologically and epidemiologically [4]. It is, however, quite obvious that some old people with asthma, having progressed to the irreversible obstructive stage, have been diagnosed as suffering from COPD. Under-diagnosis and under-treatment of asthma is common in the elderly population [8, 9]. One explanation for this might be that aged people may feel that dyspnoea and wheeze are unavoidably consequences of ageing and perhaps of their social habits such as smoking. Thus patients themselves and/or their doctors ignore these symptoms. The delay before asthma is recognized in elderly patients can be as long as almost 10 years [10]. During this delay irreversible changes in the airways may have progressed and medication introduced in a late stage will not have its best effect. A perception that therapy for old people's bronchial obstruction is futile is also not uncommon. Our material includes undiagnosed asthma which has 'progressed' to COPD to some extent. On the other hand, some authors include it as a subset of COPD [11].

COPD is a serious, disabling, and expensive condition. According to the National Health Interview Survey in the USA, COPD cases are twice as likely as the general population to rate their health as being only fair or poor, nearly twice as likely to report recent limitations in their usual activities and a much higher proportion of them report frequent visits to physicians. Their average number of short-stay hospital days during the year is 50% greater than the general population, they experience nearly twice the rates of restricted activity days and they report more than twice as many bed-disability days per year [12].

The fact that these patients, especially those treated in hospital, are old brings even more disadvantages. Elderly COPD patients often have other disabling diseases and may lack supportive social networks which would enable home care and diminish readmissions [13, 14]. In our study the proportion of new treatment periods was only 24% of all periods meaning that most of the affected patients seek hospital care repeatedly. Because of the severe nature of the disease and the late stage at which the patients first enter the health care system, COPD cases may be in such a poor condition that they cannot cope with longer periods at home. In a study of factors predicting readmission, approximately 43% of readmitted older general medical patients had a principal diagnosis of COPD or congestive heart failure [13]. The fact that the age distribution of newly hospitalized COPD patients was almost the same as in all the others indicates that these patients begin to use hospital treatment in a late stage of the disease.

Hospital admissions cannot express prevalence or incidence of a disease but some estimates are possible from identification of the new admissions in our study. In the USA, annual hospitalization rates for COPD (including asthma) were about 1/10 of the point prevalence which is in the range of 10–12% [12]. In Finland, according to a recent study, the prevalence of COPD among elderly people is 12.5% for men and 3.0% for women [15]. Using these figures we can calculate that the annual incidence of new patients aged over 64 years hospitalized with COPD in our study was about 1/20 the prevalence (5.5 new cases/1000 population/year) in men and 1/30 (1.0 new case/1000 population/year) in women. Thus one of 20 prevalent COPD men and one of 30 prevalent COPD women have such severe problems that they have to be taken to hospital as a new patient.

The burden of treatment caused by COPD will increase in future owing to the increasing number of old people. During our study period 1972–92, the number of people aged 65 or over doubled. Because smoking remains a major negative health habit in developed countries, this will also increase or maintain the need of medical treatment for COPD for many years to come [16]. In the USA, for men death rates and hospitalization rates relative to prevalence, rise with age indicating that COPD becomes a more serious health problem as people age. For women, hospitalization rates parallel the prevalence rates, but while among men the prevalence rates have been level, among women they have shown a 35% increase since 1975. This is consistent with increasing smoking by women in the USA and in all developed countries. The overall trend pattern for women is considerably more pessimistic than it is for men [12].

In instituting and evaluating treatment strategies and resources for COPD, the most important factors will be the old age of the patients and the severe nature of the disease. The number of COPD patients needing hospital care increases rapidly as the populations in Western countries age.

References

1. Dow L, Coggon D, Osmond C, Holgate ST. A population

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