Bronchiectasis in Finland: trends in hospital treatment

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The incidence of bronchiectasis has probably declined in developed countries in recent years, but no reliable statistical data on this are available. The present paper describes the use made of hospital services by bronchiectatic patients in Finland. Data on a total of 12 539 treatment periods for bronchiectasis that had occurred between 1972 and 1992 were collected from the discharge register maintained by the National Research and Development Centre for Welfare and Health (diagnosis 518 in the International Classification of Diseases up to 1986, and 494 from 1987 onwards). The number of admissions, new occurrences of bronchiectasis and days in hospital were calculated by sex and age in relation to the total population at the end of each year. There were 143 and 87 admissions per million inhabitants in 1972 and 1992, respectively. The admissions, new occurrences and the days in hospital all decreased, at annual rates of 1.3, 4.2 and 5.7%, respectively. Thus, where the number of new occurrences was 50 per million persons in 1977, it was 27 per million in 1992. In summary, bronchiectasis-related hospital treatment declined markedly between 1972 and 1992. Trend is attributed to effective treatment of pulmonary infections and the reduction in tuberculosis.

Introduction

Bronchiectasis is defined as an abnormal and irreversible dilation of one or more bronchi. The spectrum of presumed causes includes inhalation of toxic substances, severe childhood respiratory infection, aspiration, humoral antibody deficiency, mucociliary dysfunction, cystic fibrosis and allergic bronchopulmonary disease, in addition to cases of unknown aetiology (1).

The Finnish National Research and Development Centre for Welfare and Health maintains a register of all patients treated in hospitals in Finland, including their diagnoses. All treatment periods for which the main diagnosis was bronchiectasis [diagnosis 518, International Classification of Diseases (ICD), eighth revision, up to 1986 and diagnosis 494, ICD, ninth revision, from 1987] were collected from the register, including diagnostic visits, acute exacerbation stages and check-up visits. A total of 12 539 bronchiectasis-
related treatment periods were recorded between 1972 and 1992, and the numbers of admissions, new occurrences of bronchiectasis and days spent in hospital were calculated by sex and age in relation to the total population at the end of each year. The population data were based on information provided by the Central Statistical Office of Finland. There were 4.7 million inhabitants in Finland in 1972, rising to 5.1 million by 1992.

A bronchiectatic patient who had had no recorded bronchiectasis-related hospital treatment periods between 1972 and 1976, and was first treated in hospital in 1977 or later, was considered to be a new patient.

All hospital treatment days were counted as days in hospital, the days of arrival and departure making up 1 day. If the duration of treatment exceeded 365 days, these days were excluded from the analysis. There were a total of 22 treatment periods of such duration during the investigation period. The average duration of stay in hospital was calculated by dividing the number of days in hospital by the number of treatment periods.

The relative rate of change was calculated by linear regression on the natural logarithm of the rate of hospital admissions, days in hospital and new occurrences of bronchiectasis per million persons per year (8). The percentage change per year is equivalent to $100(e^\delta - 1)$. The statistical analyses were performed with the SPSS 6.1 for Windows program.

Results

TREATMENT PERIODS

Bronchiectasis-related treatment periods in hospitals amounted to 664 in 1972 (143 treatment periods per million inhabitants) and 439 in 1992 (87 per million inhabitants) (Fig. 1). The annual change in the number of such periods was $-1.3\%$ [95% confidence interval (95% CI) $-2.6$ to $-0.1$]. Forty-five percent of all treatment periods were for males.

NEW TREATMENT PERIODS

A total of 3457 new treatment periods occurred between 1977 and 1992, with 238 in 1977 and 135 in 1992, i.e. 50 per million in 1972 vs. 27 per million (Fig. 2). The annual change during this 16-yr period was $-4.2\%$ (95% CI $-5.4$ to $-2.9$). Forty-five percent of all new treatment periods were for males.

DAYS IN HOSPITAL AND AVERAGE DURATION OF STAY IN HOSPITAL

The total number of bronchiectasis-related days in hospital during this 21-yr period was 152,101, the figures being equivalent to 2716 hospital days per million inhabitants in 1972 and 611 per million in 1992. The days in hospital changed by an average of $-5.7\%$ (95% CI $-6.9$ to $-4.5$). The average duration of stay in hospital decreased during the 21-yr period, from 19.0 days in 1972 to 7.0 days in 1992.

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. The correspondence between its diagnosis data and patient records has been found to be good, as high as 95% (9). Of the new cases of bronchiectasis, 78% were diagnosed in pulmonary departments, mostly confirmed by bronchography. High-resolution computed
tomography (HRCT) began in Finland in 1989 and was gradually introduced for diagnosing bronchiectasis, firstly in the university clinics in the early 1990s. Even now, HRCT is rare in Finnish central hospitals. It is very sensitive, although it may miss cases of cylindrical bronchiectasis (10). Thus, in the present study, bronchiectasis means hospital diagnosis made without HRCT.

The ICD classification changed in 1987 between the eight and ninth revisions, but this is unlikely to have had much influence on the results concerned here. It was found in research into chronic obstructive pulmonary disease (COPD), for instance, that the changes that occurred progressively from the sixth revision to the ninth had only a minimal effect on the trend in COPD mortality (11).

The number of bronchiectasis-related hospital treatment periods, the number of days spent in hospital and the average stay in hospital all decreased during the study period. Svartengren et al., in one of the few investigations into hospital treatment provided for bronchiectatic patients in Western countries, found 771 patients with a diagnosis of bronchiectasis having at least one hospital stay in a register covering all the patients who had been in hospital in the administrative district of Stockholm (1.5 million inhabitants) between 1969 and 1978 (12).

The reduction in bronchiectasis-related hospital treatment may be attributed to a number of putative factors: early, effective treatment of necrotizing pneumonia, control of tuberculosis and the prevention of predisposing pulmonary infections by routine immunization. There was a sharp fall in the incidence of cases of bronchiectasis at children’s hospitals in England between 1950 and 1960, coinciding with the time when broad spectrum antibiotics were introduced (13). The annual incidence of new cases of tuberculosis in Finland has declined markedly during this period on account of the availability of new medication. There were 93-7 new cases of tuberculosis per 100 000 persons in 1972, but only 13-8 per 100 000 persons in 1992. The introduction of effective vaccination programmes has almost eradicated measles and reduced the cases of whooping cough in Finland, and the health care system has also become more effective in reducing the rates of bronchiectasis and shortening the duration of stays in hospital.

The decline in the number of new cases of bronchiectasis during the 16-yr period provides perhaps the clearest evidence that the disease is really decreasing, since these reflect the incidence of the disease, which was at least 27 per million persons in 1992, bearing in mind the mild cases that are not seen in this material because they are not treated in hospitals. This is much less than in the 1960s (4). Thus, bronchiectasis is rare, and even in the Finnish population of 5 million, few new cases were found.

The peak in the rate of admissions and days in hospital in 1979 may be partly attributable to the creation of a national asthma treatment programme, which probably increased the number of asthma cases (14), and aroused interest in research and treatment connected with other pulmonary disease. Thus, more cases of bronchiectasis were found than usual.

Although tuberculosis of the respiratory organs is on the decline in Finland, atypical respiratory mycobacterial diseases are apparently increasing. It is known that bronchiectatic patients often have atypical mycobacterial diseases, and there is evidence that bronchiectasis is not merely a pre-existing condition but can result from atypical mycobacterial infection (15). The existence of such infections may increase the rate of bronchiectasis in the future. Cystic fibrosis is one significant condition predisposing patients to bronchiectasis. However, although it is the most common genetic disorder in Caucasian populations and is common in many Western countries, it is rare in Finland.

In summary, bronchiectasis-related treatment periods, new treatment periods, days in hospital and the average duration of stay in hospital declined markedly between 1972 and 1992. This may be attributed to the effective treatment of pulmonary infections and the reduction in tuberculosis, and the trend is likely to continue.

References


