

Short communication

Links between hospital diagnoses of bronchiectasis and asthma

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In view of the conflicting notions of the relationship between bronchiectasis and asthma, we have analysed the use of hospital services by bronchiectasis and asthma patients and evaluated the links between these diseases, employing data from the Finnish Hospital Discharge Register of over 21 million hospitalization periods recorded in 1972–92. We conclude that asthma is common in hospitalized bronchiectasis patients and appears to be consequent upon this disease.

O. Säynäjäkangas^{1,2}, T. Keistinen¹,
T. Tuuponen¹, S.-L. Kivelä^{1,3}

¹Department of Public Health Science and General Practice, University of Oulu, Oulu;

²Department of Pulmonary Diseases, Lapland Central Hospital, Rovaniemi; ³Unit of General Practice, Oulu University Hospital, Oulu, Finland

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Dr Olli Säynäjäkangas
Lupputie 1
FIN-96200 Rovaniemi
Finland

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Although there are reports dating back to the 1930s on the significance of allergy and asthma for the pathogenesis of bronchiectasis (1), conflicting ideas still exist on the subject (2, 3). This paper aimed to explore the connection between asthma and bronchiectasis in the light of data from the Finnish Hospital Discharge Register.

Material and methods

The National Research and Development Centre for Welfare and Health is provided with accurate registration data on all patients treated in hospital in Finland, including their diagnoses (4). The resulting national register of patients discharged from hospital contains data on a total of 21 217 115 hospitalization periods for the years 1972–92, during which Finland had a mean population of 4.8 million. For the present purpose, data were extracted on the entire set of 25 208 treatment periods assigned a primary or secondary diagnosis of bronchiectasis (rubric 518, *International Classification of Diseases (ICD)*, 8th Revision to the end of 1986, and 494, *ICD*, 9th Revision thereafter) and the 480 220 periods with a primary or secondary diagnosis of asthma (493, *ICD*, 8th and 9th Revisions). Secondary diagnoses were used in 49% of treatment periods with a primary diagnosis of bronchiectasis, and in 40% of those with a primary diagnosis of asthma.

A bronchiectasis or asthma patient was designated as a new case if the respective primary diagnosis was listed for the first time on 1 January 1978 or later.

Results

A total of 2159 new bronchiectasis cases were recorded in 1978–86, of which 410 (19.0%) also had a treatment period with a primary or secondary diagnosis of asthma and 203 (9.4%) a primary diagnosis of asthma during the period 1972–92. Correspondingly, a total of 45 209 new cases of asthma were recorded in 1978–86, of which 836 (1.8%) also had a treatment period with a primary or secondary diagnosis of bronchiectasis, and 220 (0.5%) a primary diagnosis of bronchiectasis during the period 1972–92.

The mean interval between a new bronchiectasis patient's first treatment with this as the primary diagnosis and the beginning of his or her first treatment period in 1972–92 with asthma as the primary diagnosis was 1.5 years (95% confidence interval 0.6–2.3, one sample *t*-test with test value = 0); i.e., asthma tended to be the second of the two conditions to be diagnosed. Likewise, the mean interval between a new asthma patient's first treatment with this as the primary diagnosis and the beginning of his or her first treatment period

in 1972–92 with bronchiectasis as the primary diagnosis was -1.0 years (95% confidence interval -1.9 to -0.2); i.e., again asthma tended to manifest itself after bronchiectasis (Fig. 1).

Discussion

This set of data excludes mild attacks of bronchiectasis and asthma that were not treated in hospital at all during the period in question, an exclusion which may introduce some degree of bias into the evaluation of the relationship between the two diseases. On the other hand, the diagnosis of asthma is usually based on hospitalization periods of at least 1 week, a fact which improves their reliability. The data also exclude a number of asthma diagnoses reached at outpatient departments, so that it is possible that asthma occurred more frequently in the present bronchiectasis cases than these figures would lead us to believe. The numbers of bronchiectasis diagnoses may be regarded as more reliable in this respect, as most cases were confirmed by bronchography and even 80% of new bronchiectasis patients were diagnosed in pulmonary departments. The HRCT technique was introduced into Finland in 1989 and adopted for the diagnosis of bronchiectasis in the early 1990, beginning in the university hospitals.

Because asthma and chronic bronchitis are difficult to distinguish, we examined utilization data for asthma. During the 21-year follow-up, 9.6% of new asthmatics had a treatment period with a primary diagnosis of chronic bronchitis or emphysema. This overlap was a bit more than Osborne et al. found in their study, in which the follow-up was 9 years (5).

Our observations suggest that asthma diagnoses are numerous among hospital-treated bronchiectasis patients, whereas it is less common for asthma patients treated in hospital to have a previous diagnosis of bronchiectasis or for this disorder to manifest itself later. One may claim that asthma is common in patients treated in hospitals; therefore, we selected another diagnosis to process. During our study, secondary diagnoses were used in 52% of treatment periods for pneumonia; of those, the proportion of asthma was 3.2%. It is also known that asthma patients have a fourfold risk of pneumonia (6). Earlier research has shown the prevalence of asthma to be 3–4% in Finnish rural and urban populations during the investigation period (7). In bronchiectasis patients, the occurrence of asthma varied between 2.7% (3) and 27% (2).

These records of over 21 million treatment periods show that a diagnosis of asthma tends to follow one of bronchiectasis. The true time lag in the development of the two diseases may indeed be

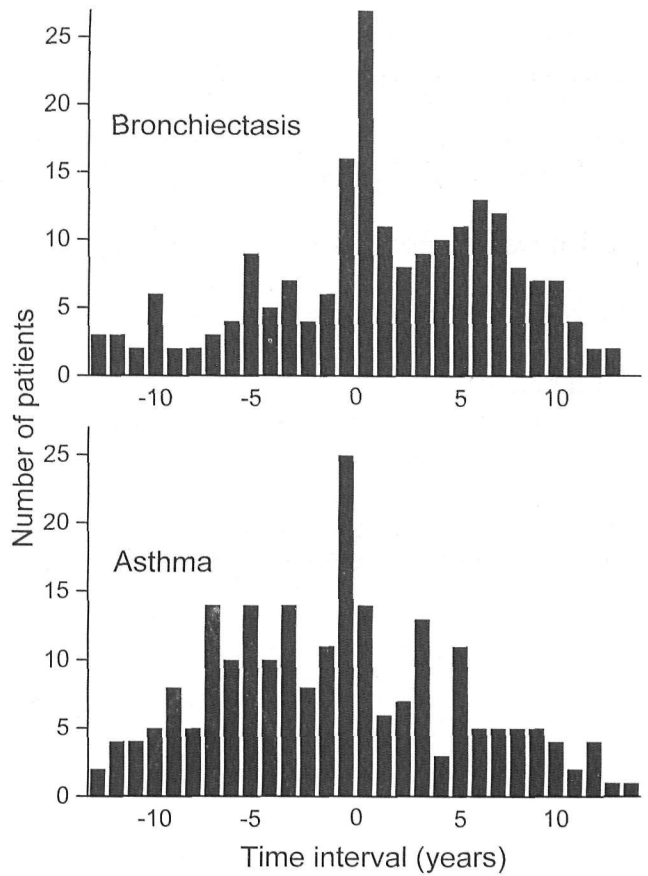


Fig. 1. Number of bronchiectasis ($n=203$) and asthma patients ($n=220$) in different time categories. These categories represent time interval in full years between first treatment period for bronchiectasis and that for asthma (upper graph) and vice versa (lower graph). Upper graph shows distribution skewed to right and lower graph to left, meaning that diagnosis of asthma tends to follow one of bronchiectasis.

somewhat greater than that indicated here, as bronchiectasis is usually more difficult to recognize than asthma and tends to be diagnosed at a later stage. After the initial insult, a “vicious cycle” of inflammation and airway damage develops gradually in many bronchiectasis patients (8), and diagnosis may be delayed for 10 years or more.

Bronchiectasis is also known to occur as a complication of allergic bronchopulmonary aspergillosis (9), and it has become evident in the last 20 years or so that many other fungi can also cause the allergic bronchopulmonary syndrome. Inadequately treated atopic asthma can cause damage to the bronchial mucosa and lead to bronchiectasis (10). At the same time, the deformation of the airways, impairment of clearance of the bronchial tree, and increased epithelial permeability associated with bronchiectasis are liable to enhance colonization and penetration by microorganisms and thereby increase sensitization to asthma.

Therefore, asthma is common in bronchiectasis patients and appears to be consequent upon the latter disease. Thus, the possibility of asthma should be taken into account when treating such patients and medication for it should be considered at an early stage.

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