Hospitalisations due to exacerbation of asthma and COPD

Summary

Background. Patients with exacerbation of asthma and COPD often need instant treatment, and acute hospitalisation may be necessary. The aim of the study was to determine what sort of contact with doctors patients had had and what sort of treatment they received prior to hospitalisation due to exacerbation.

Material and method. A questionnaire was distributed to patients aged over 18 who were hospitalised because of asthma or COPD exacerbation in Helgeland Hospital and the University Hospital of North Norway, Tromsø, between January 2010 and January 2011. The patients answered questions on the duration of the exacerbation, their contacts with doctors and their medical treatment prior to hospitalisation.

Results. Data received from 100 of the 122 patients were analysed. The median duration of illness prior to the initial contact with a doctor was four days. 52 of the patients had contacted their primary doctor first, 40 contacted A&E first, while eight contacted the hospital directly. The initial contact with a doctor resulted in the hospitalisation of 56 patients: 21 (40 %) of those who contacted their primary doctor and 26 (70 %) of those who contacted A&E. 41 patients were hospitalised without being clinically examined by the admitting doctor the same day, and 32 after a telephone consultation with their primary doctor or an A&E doctor. Patients aged over 70 were admitted more frequently without a clinical examination, as were patients who had been hospitalised previously.

Interpretation. Patients with asthma or COPD exacerbation are often hospitalised directly after a telephone consultation with their primary doctor or an A&E doctor.

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Chronic obstructive pulmonary disease (COPD) is characterised by a permanent, non-reversible reduction of lung function and results in impaired function and increased mortality (1). The diagnosis is a collective term for the obstructive lung diseases emphysema and chronic bronchitis. Patients with asthma may develop COPD, which makes the COPD patient group even more heterogeneous (2).

Acute exacerbation of COPD is accompanied by increased shortness of breath and reduced quality of life and is often the reason for hospitalisation (3). A history of illness with frequent exacerbations increases the risk of this also happening in the future (4) and gives a poorer prognosis (5). An important aim in the treatment and follow-up of COPD is therefore to reduce the number of exacerbations. The Global Initiative for Chronic Obstructive Disease (GOLD) publishes guidelines for health-care personnel who treat patients with COPD (1). According to GOLD, assessing the degree of severity can require tests that are normally only carried out at hospitals, such as X-rays and blood gas analyses.

The aim of this survey was to determine what sort of contacts with doctors, tests and treatment patients hospitalised with asthma and COPD exacerbation had had immediately prior to hospitalisation. We were particularly interested in finding out how large a proportion of the hospitalisations were based on a telephone consultation with a primary doctor or an Accident and Emergency (A&E) doctor, and how often the patient had had a clinical examination by a doctor outside the hospital the day before hospitalisation. In order to be able to place our findings in a wider context, we obtained figures from the Norwegian Patients Register on hospitalisations due to asthma and COPD exacerbation.

Material and method

Patients aged over 18 who were discharged from Helgeland Hospital or the University of North Norway between 10 January 2010 and 31 January 2011 with the primary diagnosis of asthma or COPD exacerbation were included. Immediately before their discharge or return home they were asked to complete a questionnaire about the hospitalisation in question. Those who were not mentally capable of completing the form and the critically ill were not asked, and those who were hospitalised more than once during the period were only to respond once. The patients were asked about the duration of the exacerbation, their contacts with doctors and their medical treatment prior to the hospitalisation. Information about age, gender, smoking habits and diagnosis were also requested.

Before the patient was given the form to complete, the doctor at the department had registered three pieces of information from the patient's records: last lung function measurement prior to hospitalisation (forced expiratory volume in one second, FEV_1), C-reactive protein (CRP) on admission and first recorded O_2-saturation (measured by blood gas analysis or pulse oximetry, as a rule in atmospheric air) after admission to the hospital.

Patients were offered help in the wards to complete the form, which most of them took

Main points

- In many cases, patients with asthma and COPD exacerbation are hospitalised without a clinical examination by the admitting doctor the same day
- Hospitalisation as a result of a telephone consultation was more common in patients who had been admitted with the same diagnosis previously

Table 1 Initial contact with doctor and treatment of 100 patients hospitalised because of asthma and COPD exacerbation

		Hospitalised in connection with initial contact		Not hospitalised as a result of initial contact		
				Treated with antibiotics and/or prednisolone	Only increased daily dose of regular medication	Unchanged medication
Initial contact with doctor	No.	No.	(%)	No.	No.	No.
Primary doctor:						
Consultation/home visit	27	10	(37)	9	2	6
Telephone contact	25	11	(44)	6	3	5
A&E						
Consultation/home visit	21	16	(76)	3	1	1
Telephone contact	19	12	(63)	3	1	3
Hospital doctor	3	2	(67)	1	0	0
Went straight to hospital	5	5	(100)	0	0	0
All	100	56	(56)	22[1]	7	15

[1] Six were treated with antibiotics, eight with prednisolone and eight with both. Three treated themselves with medicines they had been prescribed earlier

advantage of. Some patients had the form sent home to them by post after their discharge (a number of the patients from the hospitals in Mosjøen and Mo i Rana) and they returned it in a pre-stamped and addressed envelope.

The differences between sub-groups of patients were tested statistically by means of the chi-squared test and Mann-Whitney's test. The software SPSS 17.0 was used in the analysis, and a significance level of 5 % was chosen. No personally identifiable information was recorded, and FEV_1, CRP and SpO_2 were recorded in intervals. The survey was assessed by the Regional Committee for Medical and Health Research Ethics as being anonymous (after CRP, pO_2 and FEV_1 were specified in intervals) so that it could be conducted without approval.

Information about admissions in 2009 and 2010 to Norwegian hospitals with diagnostic codes J44.0, J44.1, J44.9 or J46 (ICD-10) were obtained from the Norwegian Patients Register and compared with figures from Statistics Norway's *Statistisk årbok* [Statistical Yearbook] 2011 (6).

Results

There were 122 patients who satisfied the inclusion criteria and who were asked to complete the questionnaire. The form was completed by 102 patients. Of these, 100 had responded to key questions about contact with doctors prior to hospitalisation, and the analysis is based on these 100. There were 50 women and 50 men. 50 of them were treated at the University Hospital of North Norway, in Tromsø, and 50 at Helgeland Hospital. The median age was 73 years. 74 patients had been hospitalised previously for the same disease. The median duration of the exacerbation by the time of the initial contact with a doctor was four days; the median duration of hospitalisation was seven days. The CRP level (recorded for 98 patients) was elevated (> 10 mg/l) in 73 (74 %); 32 (33 %) had a CRP level of 80 mg/l or more. SpO_2 was measured for 97 patients and was < 92 % in 47 (48 %).

The initial contact with a doctor during the exacerbation was with the primary doctor for 52 patients; 40 contacted A&E first and eight contacted the hospital directly (Table 1). A total of 56 were admitted after the initial contact, less often when the primary doctor had been contacted (40 %) than when an A&E doctor had been contacted (70 %). Of these 56, 30 were hospitalised without a clinical examination by the admitting doctor (Table 1). Of the 44 who were admitted at a later time, 33 were admitted after an examination by a primary doctor or an A&E doctor, nine after a telephone consultation with the admitting doctor, while two went straight to the hospital. A total of 41 patients (41 %) were thus hospitalised without undergoing a clinical examination by a doctor the same day. Admissions without a clinical examination were more common at Helgeland Hospital (52 %) than at the University Hospital of North Norway in Tromsø (30 %, p = 0.03), in patients over 75 years old compared with younger patients (51 % versus 26 %) and in those who had been hospitalised previously compared with those who were hospitalised for the first time with the diagnosis in question (50 % versus 18 %, p = 0.003).

In 2010, asthma or COPD exacerbation was the main cause of 9 752 hospitalisations in Norway, representing 6 256 patients (7), in persons aged over 18. The number of patients was probably a little lower than the number recorded, as those who were hospitalised at more than one health enterprise during the period were registered more than once. 53.3 % of those who had been hospitalised were women, and 72 % of them were aged over 65. As at 1 January 2011, there were 3 804 million people over the age of 18 resident in Norway (15). The annual frequency of persons hospitalised because of asthma or COPD exacerbation is thus of the order of 6 256/3 804 000≈ 1.6 per 1 000 inhabitants over 18 years old.

At Helgeland Hospital, 113 admissions were registered in 2010 and at the University Hospital of North Norway 335 were registered (7). We can assume that half of the admissions at the University Hospital of North Norway were at the hospitals in Narvik and Harstad. After deducting these, there were a total of some 300 hospitalisations for asthma or COPD exacerbation at Helgeland Hospital and the University Hospital of North Norway in the period in question. However, about a third of these were re-admissions. In other words, about 200 patients could be considered for inclusion in this study. 100 of them were included.

Discussion

The study shows that hospitalisation of patients with serious asthma or COPD often takes place after a telephone consultation with a doctor, or by the patient going directly to the hospital. In our material, only 59 of the admissions (59 %) were based on a recent clinical examination. Patients who had previously been hospitalised with COPD or asthma exacerbation were more often admitted following a telephone consultation than patients who had not previously been hospitalised with these diagnoses (data not shown). This may indicate that those who have previously been hospitalised for exacerbation are more often convinced from their own experience that hospitalisation is called for. The high frequency of telephone consultations may also be an indication that clinical examination and the tests available to the primary doctor are not attributed much weight in the decision to hospitalise. It is likely that both patient and doctor feel that examination at a doctor's office or

A&E will not contribute substantially or constructively and only lead to detrimental delay of the hospitalisation.

Admission to hospital following a telephone consultation was more common in Helgeland than in Tromsø. This may be due to variable availability at the municipal A&E units and different procedures with respect to requiring that the primary doctor verify hospitalisations. It may also be due to large variations in distance to doctor's office and hospital. The likelihood of patients being hospitalised after a telephone conversation rose with increasing age. The doctors' decisions were doubtless well founded when the patient was well known or clearly seriously ill. But when this happens as frequently as this study indicates, one may wonder whether some patients might be served equally well by an option of treatment outside hospital.

Telephone contact can also be a source of good advice. A survey from the UK has shown that ready access to telephone consultations for COPD patients may contribute to reducing the number of hospitalisations (8).

One may wonder how representative our findings are. There were about 200 admissions to Helgeland Hospital and the University Hospital of North Norway that could be considered for inclusion in the study. If we exclude those who died and those who were too sick or too mentally incapacitated to answer the questionnaire, there were probably not many more than the 122 to whom the questionnaire was distributed who could have been included. Since responses from 100 (82 %) of these could be analysed, we can assume that the results are relatively representative for the hospitals that participated.

The age and gender composition of the material corresponds to the national figures. However, there may be differences from one part of Norway to another with respect to how the doorkeeper function of the primary doctors is practised for this kind of patient. The completion of the questionnaire survey may also represent sources of error. Although patients were asked about events in the recent past, some may have responded incorrectly nonetheless because they do not remember details of the course of events or because questions were misinterpreted.

In this study we see reality from the perspective of a hospital. The picture would have been different if we had taken all patients with asthma or COPD exacerbation as our starting point and investigated how many contact doctors and what treatment is given. We would probably then have had a patient material where a minority would have been hospitalised.

In this material, those who initially contacted their primary doctor had to wait longer on average for hospitalisation than those who contacted A&E (data not shown). This may reflect the fact that those who contact A&E are sicker than those who contact their primary doctor. Primary doctors may also be more confident about treating the patient outside hospital than A&E doctors, as it is easier for them to provide close follow-up.

Doctors in the primary health-care service do not have unambiguous guidelines to follow in connection with asthma and COPD exacerbations. Spirometry can reveal whether the patient's respiration has become more obstructive; CRP measurement can provide information about the severity of the exacerbation and the probability of bacterial infection (9, 10), and pulsoximetry that shows reduced SpO2 can also say something about severity and indicate whether oxygen treatment should be given. However, the usefulness of these tests has not been evaluated to any great extent in connection with asthma and COPD exacerbations in general practice, and pulsoximetry is the only one that is recommended in international guidelines (1, 11, 12).

Doctors are in need of tools of this kind when deciding on treatment of exacerbations, as well as a sound knowledge of the severity of the disease, previous exacerbations and any comorbidity the patient may have. A clinical examination remains important for determining how ill the patient is and whether anxiety is contributing to their breathing problems. In many cases, primary doctors, with their knowledge of the patient, will be in a better position to make a good clinical assessment than the A&E doctor.

Primary doctors have two main options today when it comes to asthma and COPD exacerbation: hospital treatment and treatment at home. If it were also possible to admit the patient to an infirmary with access to blood gas measurement, X-rays and non-invasive respiratory support, primary doctors would have to expand their basis for decision-making and a thorough prehospital examination would be even more relevant. In other Western countries there has been fruitful testing of treatment at home, by hospital personnel, of patients with COPD exacerbation who had first been examined in Reception with a view to admission. This treatment has been regarded as suitable for about a quarter of the patients (13).

Recent COPD research indicates that it will be appropriate to divide COPD into subgroups that are to receive different treatments (4, 14). This will also have a bearing on handling of exacerbations. It will entail a need for continuing professional development, also for GPs, and development of routines that instil confidence in both primary doctors and patients.

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