

16.2.18

## Effect of an Asthma Clinic Run by the General Practitioners on Patient's Morbidity in the Health Insurance in Ismailia

MAGED KHATTAB, M.D.; ADEL MISHRIKY, M.D. and  
KHALED MUSTAFA, M.D.

*The Departments of General Practice, Community and Internal Medicine,  
Faculty of Medicine, Suez Canal University.*

### Abstract

The aim of this study was to assess the effect of an asthma clinic run by general practitioners on patients morbidity, process of care and prescribing for asthma. Seventy asthma patients were studied. Comparisons were done before and 6 months after the intervention. Morbidity was measured in terms of frequency of the asthma attacks, night asthma, days off-work lost, as well as the values of Peak Flow Rates measured by the peak flow meter. Results have shown a statistically significantly decreasing trend in morbidity ( $p < 0.001$ ). Also, significant reductions were found in the patients requirement to corticosteroid ( $p < 0.0$ ) and the work-days lost ( $p < 0.0001$ ). Significant improvements in the patients knowledge about asthma and in the inhaler technique were observed after the intervention. Lastly, the use of inhaler bronchodilators and steroids and of prophylactic medication have increased significantly.

### Introduction

**THERE** is an abundant evidence from general practice [1], community surveys [2] and hospital studies [3], that under-diagnosis, inadequate treatment and poor patients education in bronchial asthma are still prevailing. Despite the recent advances in the understanding of the pathogenesis of this disease and the new therapeutics, still its morbidity and mortality are not declining. Much of the unnecessary morbidity has been linked to the under-use of inhaled and oral corticosteroid, in addition to the neglect of the use of objective measurements of severity and inadequate follow-up. More-

over, trends in asthma mortality are rising in several countries [4] and up to 86 percent of the deaths due to asthma may have avoidable factors. Some of these latter relate to the process of delivery of care [5].

Asthma is a disease that can respond dramatically to treatment and it is likely that improved systematic asthma care might well produce reductions in asthma morbidity. Several studies have shown such improvement in primary care or hospital-based asthma clinics [3,6,7].

The aim of Health System Research (HSR) is to assist in the provision of better

care with wider coverage of the population and at the minimum cost possible [9]. Hence, the aim of this HSR intervention study is to evaluate the effect of the establishment of an asthma clinic run by the general practitioners in a health insurance system on the quality of care and the morbidity of the disease.

### Subjects and Methods

The study was carried out on all the Health Insurance asthmatic patients affiliated to the Faculty of Medicine, Suez Canal University polyclinic. The care provided to these patients used to be integrated in the ordinary busy outpatient clinic hours.

The intervention: All bronchial asthma patients (n=70) presenting to the center were recruited to an asthma clinic run on three afternoons per week, from 2 to 5 p.m., by one general practitioner faculty member, two residents from this same department and one nurse. Special problem-oriented records were designed for the clinic, serially numbered and kept in a filing cabinet within the clinic. Each patient was given a serial number which was also registered on his own Health Insurance I.D. for reference and easy retrieval of his clinic record on each visit.

The clinic record consisted of three sheets. The first one was allocated for family information including family tree, any relevant health problems affecting the family members, resources and support systems. History of drug allergy was also recorded on this sheet. On the second one, the drug therapy prescribed on each visit was recorded. The third sheet was concerned with the asthma assessment protocol. On its front page, information regarding the onset, predisposing and precipitating factors of asthma were recorded. These in-

cluded, among others, the age at start, smoking, crowding index, other allergic conditions, the days lost from work, as well as occupational history and results of Pulmonary Function Tests. These latter were evaluated by an occupational medicine specialist to exclude occupational asthma and evaluate reversibility and response to treatment. The back-page consisted of a table where the assessment of the patients was recorded at each visit. The evaluation was based on last month information regarding the frequency of the attacks, night asthma, frequency of use of inhalers, pulse and respiratory rates, pulses paradox, cyanosis and the Peak Expiratory Flow Rate (PEFR) using clinic Wright Peak Flow Meter. Lastly, the doctor's assessment of the grade of asthma was recorded.

Referral to the chest specialist was done according to the guidelines of the British Thoracic Society [9], i.e. patients with doubtful diagnosis or with a problem in management. Objectives for good asthma care were set according to the list of Barritt and Staples [10]. The knowledge and skills of the patients regarding asthma care were assessed. Findings served to tailor health education messages to increase their awareness and promote their skills regarding home care of asthma. Each patient's inhaler technique was revised and graded into good, moderate or poor according to Barritt and Staples criteria [10]. Then, he received a brief explanation of the mechanism of his asthma and the action and proper use of his medications. These were reinforced by health education pamphlets, in addition to smoking cessation messages. Finally, each patient was assigned a self-management plan and instructed to use it. During each monthly follow-up visit, topics such as smoking,

holidays, provoking factors, stress and emergency treatment, were discussed. Patients were advised to consult their physician whenever they wished.

Guidelines of the British Thoracic Society [9] for the use of bronchodilators and corticosteroids in asthma, were followed in the clinic. Assessment of asthma morbidity was done according to the Disability Score (DS) used by Barritt and Staples [10], the Morbidity Index (MI) by Jones et al., [11] and the P.E.F.R. Patients were classified as having mild asthma if their disability score was 20 or below, their morbidity index was 1 and their P.E.F.R. was 70 percent of predicted or above. Patients with DS 21 to 24, MI equal to 2 and PEFR 70 percent of predicted or above, were classified as having moderate asthma. Severe asthma criteria included a DS of 25 or more, a MI of 3 and a PEFR less than 70 percent of predicted.

Comparisons of the patterns of change of morbidity, of the use of inhalers and of the change of awareness, were done using the Chi square test for trend. Because the number of sick-leaves were not normally distributed, they were compared by the non-parametric Wilcoxon rank test.

### Results

Of a total of 70 asthma patients, 27 (38.6%) were females and 43 (61.4%) males. Their age ranged from 25 to 65 years. Most of this population had average to basic education (42.9 and 31.4% respectively), while 25.7 percent were university graduates. The majority were working in the education sector, the largest group of beneficiaries affiliated to the center. The crowding index was above 2 in 54.3 percent of the cases. Sixteen of the patients were cigarette smokers. They were all males, giving a rate of 37.2 percent. Fam-

ily history of asthma was positive in 11.4 percent of the cases, while other allergic manifestations, such as allergic rhinitis, were present in 7 patients (10%). The duration of asthma ranged from 2 to 25 years.

The degree of asthma morbidity was found to have a decreasing trend after the intervention as shown in table (1). This change was statistically significant ( $p < 0.01$ ).

Table (2) shows that the intervention has successfully achieved the set objectives of the clinic. There was a regular use of the Peak Flow Meter for the assessment of morbidity. The knowledge of the patients regarding asthma significantly increased. A statistically significant improvement of the inhaler device technique was observed. Also, a statistically significant decrease in the number of days off work (sick-leaves) was found after the intervention.

In table (3), the prescribing patterns are compared before and after the installation of the clinic. A shift from oral and parenteral therapy to inhaler therapy was observed. This was true both for bronchodilators and corticosteroid. Lastly, the use of prophylactic sodium cromoglycate significantly decreased.

### Discussion

This study was done to test the hypothesis that a general practitioner-run asthma clinic can lead to improvement in the organization of asthma care and patient morbidity. The study results have demonstrated that the clinic had a positive effect on patient morbidity. This is evidenced by the trend of reduction of the percentage of patients with severe forms of asthma after the intervention and the significant increase of the low morbidity category. Improving the

Table (1): Comparison of the Degree of Asthma Morbidity before and after the Installation of the Asthma Clinic.

Asthma Morbidity	Before clinic		After clinic	
	Number	%	Number	%
Low	12	17.1	23	32.9
Moderate	18	25.7	31	44.3
High	40	57.2	16	22.8
Total	70	100.0	70	100.0

Chi-square trend = 13.8449  
 $p < 0.01$

Table (2): Achievement of the Objectives of Good Care by the Asthma Clinic.

	Before clinic		After clinic		Statis. signif.
	Number	%	Number	%	
Regular measurement of PEFR	0	0.0	70	100.0	
<i>Inhaler devices:</i>					
- Users	35	50.0	60	85.7	$x^2 = 18.9$ $p < 0.001$
- Technique					
Good	4	11.4	32	53.3	$x^2$ trend = 31.17 $p < 0.001$
Moderate	8	22.8	21	35.0	
Poor	23	65.8	7	11.7	
<i>Knowledge about asthma:</i>					
Good	14	20.0	27	38.6	$x^2$ trend = 8.37 $p < 0.01$
Moderate	22	31.4	24	34.3	
Poor	34	48.6	19	27.1	
<i>Sick-leaves:</i>					
None	38	54.4	56	80.0	Wilcox. rank test $z = 4.61$ $p < 0.001$
1-6 days	12	17.1	7	10.0	
1-3 weeks	8	11.5	3	4.3	
4 weeks+	12	17.0	4	5.7	

Table (3): Types of Medications before and after the Installation of the Asthma Clinic.

	Before clinic		After clinic		* <i>p</i> - value
	Number	%	Number	%	
<i>Bronchodilators:</i>					
Inhalers	35	50.0	60	85.7	< 0.001
β-agonists	68	97.1	40	57.1	< 0.001
Theophyllines	30	42.9	15	21.4	< 0.001
Ephedrine	12	17.1	3	4.3	< 0.05
<i>Corticosteroids:</i>					
(oral, parenteral)	19	27.0	6	8.6	< 0.01
<i>Corticosteroids:</i>					
(inhalers)	2	2.9	15	21.4	< 0.05
<i>Na cromoglycate</i>	20	28.6	9	12.9	< 0.05
<i>Corticosteroids:</i>					
(short course)	12	17.0	5	7.1	> 0.05

Chi-square test

measures of outcome assessment in asthma is made difficult by several factors [10]. There is a group of patients who will tend to ignore medical advice however good the care provided. At the other end of the continuum is a group who will educate themselves and find the care they require however poor the service in primary care is. In the middle is the group who may improve when medical care is bettered. Also, many patients have had asthma for many years and may have fixed irreversibility or suffer from co-existent chronic bronchitis. In addition, some asthma is resistant to treatment and some patients are so concerned about therapeutic side-effects, that they prefer to tolerate ill-health. Patients middle asthma may have few symptoms to improve. Nonetheless, there is evidence that improving patients understanding and compliance with therapy would lead to improvement in asthma morbidity.

In this study, patients knowledge about treatment, inhaler technique and when to

call for help, have improved significantly six months after the start of the clinic. Clear explanations and simply written instructions are needed, in addition to regular checking. The significant reduction in the number of days off-work is another indicator of improvement of morbidity. These results are comparable to those achieved by Beasley and Colleagues [12] in their hospital based study on 36 adult patients attending a hospital asthma clinic. They reflected a significant improvement in all morbidity criteria and in time lost from work at school.

Charlton et al. [13] found as a result of attending a nurse asthma clinic in primary care that there was a significant reduction in the patients requirements for courses of oral steroids, acute nebulization and days lost from work and school. Pearson [14], in a small scale study on 19 male patients attending a general practice-based, nurse-run clinic have also demonstrated a reduction in the use of nebulizers as results of the

nurse intervention. Similarly, Firemen and his Colleagues [7] comparing a group of 13 patients attending a hospital-based, nurse-run clinic, while with a control group, have demonstrated a significant reduction in the days, as a result of the establishment of the clinic.

The clinic had also some positive effects on the process of care and prescribing pattern. The process of care has improved due to many factors. Firstly, the design of few problem-oriented clinic records made information available to the doctor regarding the patient's family, psycho-social background, as well as disease risk factors. Secondly, the adoption of a protocol for assessment of the degree of asthma and for intervention, with the regular use of mini-Wright peak flow meter, minimized differences in doctors approach to asthmatic patients. These two factors gave the chance to the practitioners to discuss their cases and audit their work regularly. The third factor was the time allocated to patients education in this clinic. That was made possible through the organization of the work in the clinic, giving increasing responsibilities to the nurse in charge.

The effect of the clinic on the pattern of prescribing was also evident. The detailed evaluation of the patients in the clinic, with the increase of their awareness towards self-assessment and proper use of medications, led to an increase in the proportion of patients using prophylactic medication. Although this alone could have been responsible for the changes seen in patient morbidity, it is unlikely that such changes would have occurred without restructuring of the care that the clinic has initiated.

The asthma clinic also resulted in a shift towards higher potency inhaled steroids being prescribed for prophylaxis in-

stead of oral or injectable steroids that used to be prescribed. Inhaler steroids containing 50 µg beclomethazone per puff were prescribed for use two or three times per day as prophylaxis and maintenance therapy in patients with severe asthma, instead of prednisolone 10 mg per day. This led to marked reduction in the use of steroids. Also, with proper assessment of asthma, many patients with chronic intrinsic asthma were found to be taking unnecessary sodium cromoglycate. Repeat prescribing of this drug has been restricted to proved usefulness for each individual patient.

The results suggest that there is no single important factor or group of factors governing management of asthmatic patients. Health education might therefore prove more effective if it paid less attention to the possible causes of poor self-care and instead offered pragmatic advice on changing behavior. We found that asthma clinic in general practice was able to meet this challenge.

Thus, an asthma clinic in general practice, run by interested staff, with organized care, good records and protocol for asthma with emphasis on patients education would lead to improvement in asthma morbidity, reduction of the need for oral steroids and of the time lost from work.

### References

- 1- HORN C. and COCHRANE G.L: An audit of the morbidity associated with chronic asthma in general practice. *Respir. Med.*, 83: 71-75, 1989.
- 2- ANDERSON M., BAILY P. and COOPER J.: Medical care of asthma and wheezing in children; a community survey. *J. Epidemiol. Community Health*, 37: 180-186, 1983.
- 3- BUCKNALL C., ROBERTSON E., MO-

- RAN F. and STEVEN R.: Differences in hospital asthma management. *B.M.J.*, 296: 1637-1639, 1988.
- 4- JACKSON R., SEARS M., BEAGLEHOLE R. and REA H.: International trends in asthma mortality: 1970-1985. *Chest*, 94: 914-919, 1988.
- 5- FIRENEB P., FRIDAY G. and GIRA C.: Teaching self-management skills of asthmatic patients. *Pediatrics*, 68: 341-347, 1981.
- 6- BISHOP J. and SAJID A.W.: Health systems research: a case study approach to learning. WHO-EM/RSR/046' pp. 9-10, 1991.
- 7- British Thoracic Society (B. T. S.). Guidelines for management of asthma in adults: I-chronic persistent asthma. *B.M.J.*, 301: 651-653, 1990.
- 8- BARRIT P. and STAPLES E.: Measuring success in asthma care: a repeat audit. *Br. J. Gen. Pract.*, 44: 232-236, 1991.
- 9- JONES K., BAIN D., MIDDLETON M. and MULLEE M.: Correlates of asthma morbidity in primary care. *B.M.J.*, 304, 1992.
- 10- BEASLEY R., CUSHLEY M. and HOLLGATE S.: Self-management plan in the treatment of asthma. *Thorax*, 44: 200-204, 1989.
- 11- CHARLTON I., CHARLTON G., BROOMFIELD J. and MULLEE M.: Audit of the effect of a nurse run asthma clinic on workload and patient morbidity in general practice. *Br. J. Gen. Pract.*, 41: 227-231, 1991.
- 12- PEARSON R.: Asthma care. *Update*; June 15: 1139-1147, 1986.