

Regular Follow-up as Part of an Asthma Management Plan:

A Study of Hospitalised Patients in Malta

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Abstract

Objective: To study the management of specific sub-groups of patients with asthma in Malta, using locally published guidelines for comparison.

Method: A piloted, structured interview among patients between the ages of 14-59 years who were hospitalised with an admission diagnosis of acute asthma. In the case of repeated admissions, only the first interview was considered. All interviews were carried out by either of two clinical pharmacists and lasted about 30 minutes. The four-year prospective study started in February 1997 (one year before publication of the Malta guidelines) and finished in January 2001 (three years after publication).

Main outcome measures:

- Inhaled steroids on admission
- Patient partnership: use of a written self-management plan and home peak flow monitoring
- Patient compliance with inhaled steroids

Results: 304 patients (68% females; mean population age 33.9 years SD 13.41) were interviewed over the four year period. Of the 304 patients, 32% were regularly followed up with the majority of patients (25.3%) being under specialist care; 54% of patients were not followed up as part of a long-term asthma management plan. It was not possible to obtain complete information in 14% of patients. The chi-square test was used to compare the two groups. With the exception of home peak flow monitoring, patients who were regularly followed up had statistically significant better management as recommended by the Malta asthma guidelines compared to those who were not regularly followed up.

Conclusion: The findings of this study indicate that regular physician review results in better asthma management when assessed by comparison to published guidelines. However, despite regular follow up, certain aspects of patient care are inadequate in the light of the Malta asthma guidelines. It is suggested that the clinical pharmacist is well-placed to offer advice in order to promote adherence to guidelines.

Introduction

Asthma guidelines have been developed in many countries in an effort to reduce asthma morbidity and mortality¹⁻⁹. Published guidelines recommend regular patient follow-up as part of a comprehensive long-term asthma management plan¹⁰⁻¹².

The National Heart, Lung and Blood Institute (NHLBI) in collaboration with World Health Organization has published guidelines recommending follow-up at one to six monthly intervals depending upon severity and degree of control¹⁰. This strengthens the partnership between the patient and the clinician and:

- Ensures that asthma control is maintained
- Ensures that the appropriate step-up or step-down in treatment is considered
- Gives an opportunity to review and monitor the daily self-management plans and assess the necessary skills including use of inhaler device and peak flow meter techniques
- Allows assessment of patient compliance with medication prescribed
- Provides an opportunity to educate the patient and reinforce information given during previous visits.

The importance of partnership with the patient through continuity of care is also emphasized by national guidelines

Keywords

Malta, asthma, guidelines, adherence, regular follow-up

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including those published by the British Thoracic Society (BTS) and the Malta Asthma Guidelines, published in February 1998^{11,12}. As described by the authors, the aim of these guidelines is 'to optimise long term care of asthma, reduce morbidity and improve quality of life¹².' Regular patient follow-up is one of the interventions recommended to achieve this aim. Despite the fact that the first asthma guidelines were published in 1990 and despite the importance of regular patient follow up, there are relatively few studies measuring the impact of regular follow-up on patient outcomes. A number of published studies and reviews suggest that discontinuity of care is a risk factor for adverse asthma outcomes including increased morbidity and mortality, increased hospitalisation rates and overall caused suboptimal management of asthma¹³⁻¹⁶. Patients who are less likely to receive regular care are the socially disadvantaged, the poor and ethnic minorities who have less access to medical care^{14,15}. Psychosocial features also need to be considered during a patient assessment as these have a bearing both on short-term and long-term management. Studies have indicated that despite having experienced near fatal asthma, patients still comply poorly with follow-up care even if this is provided free-of-charge at regular intervals. Denial is also a possible reason for non-compliance^{17,18}. Patient-physician interaction is another important determining factor and may result in poor patient understanding, lack of adherence to prescribed regimens and an inability to deliver medications correctly.¹⁹

The objective of this study is to study the management of specific sub-groups of patients with asthma in Malta, using locally published guidelines for comparison.

Method

Study Population

Inclusion criteria were:

- Patients admitted through the Accident and Emergency (A&E) Department at St. Luke's Hospital, Malta
- Patients between 14-59 years of age
- Patients with an admission diagnosis of acute severe asthma made by the admitting medical officer and confirmed by a more senior physician
- Patients residing in Malta for a minimum of five years.

Exclusion criteria were:

- Patients not falling within the specified age limits
- A referral diagnosis of acute severe asthma not confirmed on admission by the medical staff at A&E Department
- Newly diagnosed asthmatics or repeat admissions during the study period
- Individuals on a short visit to Malta

Data collection

A patient interview was considered the most suitable method to collect data for this study and was preferred to a postal or self-administered questionnaire since it assured that as many questions as possible were answered, eliminating any possible

language barrier and any literacy requirements. Precautions were taken to eliminate interviewer bias. These included involving the same two interviewers throughout the study years, involving the interviewers in each stage of development of the interviewing form and using the exact words and order of questions on the interviewing form. The questions were mainly precoded or closed ended questions to allow for easy data handling.

Development of the interviewing form

An item list of the variables that required to be addressed was generated following a review and discussion of published literature relating to the factors associated with hospital admissions. The following information was utilised for the purpose of this study:

- General demographic information
- Patient follow up: whether the patient sought medical advice as part of a prearranged visit to a GP or a respiratory specialist or only when asthma was out of control
- Appropriateness of use of medication prescribed, including availability of a spacer device and use and compliance with inhaled steroid treatment when prescribed
- Patient partnership and involvement in management of the condition including availability of a self-management plan and home monitoring
- Assessment of current level of severity of asthma according to BTS guidelines determined from treatment on admission, patient's perception of asthma, number of days per week the patient is woken up at night due to asthma attacks, asthma control over the week prior to admission and any admission to intensive care unit over the previous 5 years.
- Demonstration of inhaler technique: patients were asked to demonstrate their technique using metered-dose inhalers with an assessment score based on the recommended close-mouth technique.¹⁹

To ensure clarity of questions, a pilot study was initially carried out when patients were asked to describe what they understood by each question. To validate the interviewing form a test-retest was performed by conducting the interview on 10 patients and repeating the interview after four weeks. Inter-rater testing was done by repeating the same interview separately to the same patient by each of the two interviewers.

Patient recruitment

A&E department admission log books were monitored regularly by pharmacists in the research team between February 1997 and January 2001. Patients' medical notes were then reviewed on the ward to confirm the diagnosis and adherence to the inclusion criteria. Patients were interviewed within 48 hours of admission and only the first interview was considered in the case of readmissions. When comparing the number of patients recruited to the number of patients with a discharge diagnosis of asthma as provided by the Department of Health Informa-

tion, it was estimated that about 80% of patients admitted with an acute exacerbation of asthma were correctly identified over the four study years²⁰.

Measures used

Data for the following outcome measures were compared for patients regularly followed up with those attended to only when the asthma was out of control:

- Inhaled steroids prescribed prior to admission: this was determined through the patient interview and confirmed through the patient's medical notes or manual records of medicines dispensed through the government health service
- Patient participation in care: assessed through availability of a self-management plan and home peak-flow monitoring
- Patient knowledge and understanding assessed by determining whether the patients maintained the same doses of inhaled steroids even when asymptomatic and whether they missed doses of inhaled steroids
- Patient skills: assessed by observing use of inhaler and use of a spacer device.

Data handling and analysis

Data were coded, entered into Microsoft Excel database and analysed using SPSS package version 10. Pearson's chi-square test (Asymp. Sig, Two-sided) at $p < 0.01$ was used to compare patients who were regularly followed up with those who were not regularly followed up. Student's t-test was used to compare the average scores for the inhaler technique.

Results

Over the four study years, 398 patients with an admission diagnosis of an asthma exacerbation were surveyed: 94 patients did not satisfy the inclusion criteria. Data were incomplete for 43 patients: 29 patients discharged themselves on request, 1 patient passed away, 2 patients suffered from severe disability, 4 patients had severe psychiatric illness and 7 patients were unwilling to cooperate with the interviewer. There were approximately twice as many females as males in the study and the average age was 34 years (Table 1). The average duration of asthma was 13.6 years with 81 patients suffering from asthma for less than 5 years and 6 patients suffering from asthma for more than 46 years.

Table 1: Characteristics of hospitalised adult asthmatic patients

	Year 1	Year 2	Year 3	Year 4	Total
Total number of patients	134	95	84	85	398
Number of newly diagnosed patients	8	7	2	7	24
Number of repeated admissions	13	16	17	24	70
Number of patients eligible for study	113	72	65	54	304
Demographic details for eligible patients					
Gender					
Male	42 (37%)	25 (35%)	23 (35%)	18 (33.3%)	108 (35.5%)
Female	71 (63%)	47 (65%)	42 (65%)	36 (66.7%)	196 (64.5%)
Smoking status					
Nonsmokers	59 (52%)	41 (57%)	37 (57%)	31 (57%)	168 (55%)
Smokers	50 (44%)	26 (36%)	28 (43%)	21 (39%)	125 (41%)
Unknown	4 (4%)	5 (7%)		2 (4%)	11 (4%)
Average age					
	33.2 years ±14	33.9 years ± 12.8	33.2 years ± 12.6	34.7 years ± 11.6	33.9 years ± 13.4
Average years with asthma					
	19.7 years ± 12.7	17.2 years ± 15.5	12.8 years ± 10.1	13.3 years ± 11.7	13.6 years ± 11.5
Patient Follow up					
Regularly followed up	39 (34.5%)	24 (33.3%)	18 (27.7%)	16 (29.6%)	97 (31.9%)
Not regularly followed up	71 (62.8%)	41 (56.9%)	36 (55.4%)	16 (29.6%)	164 (53.9%)
Unknown*	3 (2.7%)	7 (9.8%)	11 (16.9)	22 (40.8%)	43 (14.2%)

*Data were incomplete in the case of 43 patients over the four study years: 29 self-discharged, 7 not cooperative, 4 patients with psychiatric illness, 2 severely disabled and 1 died.

Indices of severity of asthma for the patient group are summarised in Table 2. Descriptive analysis indicates that patients were suffering mostly from moderate to severe asthma.

Of the 304 patients, 32% were regularly followed up with 6.6% of them followed up by primary care physicians and 25.3% of patients under specialist care. A majority of patients (54%) were not followed up as part of a long-term management plan. The Malta guidelines recommend use of an inhaled steroid as first-line management in moderate to severe asthma. Most of the patients in the followed up and regularly reviewed group (92.8%) were on inhaled steroids prior to admission. In contrast, fewer patients who had not been regularly followed up were on inhaled steroids (68.9%) and statistical significance (at $p < 0.01$) was found when comparing the two groups. Table 3 summarises data for the outcome measures for the two patient groups.

Management plans recommended in the guidelines indicate the need to use a spacer device to reduce adverse effects and maximise the efficacy of inhaled steroids. Statistical significance was found when comparing the groups with the number of patients using a spacer being higher in the regularly reviewed group (69.1%) compared to 37.1% of patients who were not regularly followed up. Patients' inhaler technique was observed and the mean score obtained by patients regularly supervised was 5.85 out of 8 (SD1.94) while that obtained by patients who were not followed up was 5.64 out of 8 (SD1.89). No statistically significant difference was found between these two groups. Patients were asked whether the same dose of inhaled steroid was maintained even when asymptomatic, with the question being omitted when the patients were not on an inhaled steroid. Statistical significance was found between the two groups with patients not regularly followed up having a greater tendency to stop the inhaled steroid when they become asymptomatic.

Self-management based on home peak-flow monitoring is recommended by the Malta guidelines with an Asthma Treatment Card to help in self-management proposed as an annex to the guidelines. Statistical significance was found when comparing the two groups, again with patients reviewed regularly being more likely to be provided with a written self-management plan. There is no significant difference when comparing groups for availability of a personal peak-flow meter, with only around 10% of patients overall, being in possession of such a device.

Limitations

These include:

- A manual system for recording patients at A&E department made screening difficult
- Missing out patients admitted to antenatal wards since an alternative diagnosis to asthma was documented
- Determining patient compliance through interview resulting in a subjective result
- Not interviewing patients discharged at request. This may introduce bias towards compliant patients since it is most likely that those discharged at request also tend to be noncompliant to health care advice

Table 2: Indices of asthma severity

	% number of patients (n=304)
Step in BTS Guidelines	
Step 1	17.4
Step 2	42.8
Step 3	21.0
Step 4	7.8
Step 5	0
No treatment	4.5
Not as per guidelines	6.5
Chronic Asthma Severity	
Number of nights disturbed due to asthma per week	
0	46.0
1	3.0
2	7.3
3	4.3
4	1.8
5	0.3
6	0.7
7	19.4
Data incomplete	17.2
Effect of asthma on daily activities	
No effect	24.7
Little	8.9
Moderate	26.6
Severe	25.0
Data incomplete	14.8
ITU admissions in past 5 years	
0	82.6
1	2.3
2	0.3
Data incomplete	14.8
Management of exacerbation	
Nebulised treatment in prior week	
No	30.9
Yes	54.6
Data incomplete	14.5
Oral steroids in prior week	
No	56.3
Yes	29.6
Data incomplete	14.1

Discussion

In Malta, this is the first study carried out to compare actual practice with optimal practice. The number of patients regularly supervised is low when compared to studies in other communities where rates of 83-100% are quoted (compared to the local rate of 32%)²¹⁻²⁴. Often, this has been related to a lack of

availability of medical treatment. However, this is not the case locally where both medical supervision and treatment are offered free of charge and are easily accessible to all asthmatics. This points to the need for better patient education in order to understand the importance of regular follow-up as part of an overall management plan. The number of patients followed up by their family doctor is very low compared to the number of patients followed up by respiratory specialists. This does not follow trends reported in the literature where a larger number of patients are followed up in a primary rather than in a secondary care setting²¹⁻²⁴. This may indicate the need to restructure primary care particularly with respect to follow-up care offered at regional health centres. These seem to be utilised mainly when the condition is out of control rather than as part of a long-term management plan.

Results of this study are consistent with those of other published reports where discontinuity of supervised care has been linked to unfavourable asthma outcomes¹³⁻¹⁸. With the exception of home peak-flow monitoring, all outcomes measured were significantly different in the patients regularly followed up when compared to patients who only sought medical help when asthma was out of control. Such a result supports the hypothesis that regular physician review results in better asthma management when measured against published guidelines. Several

studies indicate that rate of adherence to guidelines is higher when patients are followed up by specialists compared to general practitioner follow-up²³⁻²⁵. Comparison of the two groups was not possible in this study due to the small number of patients followed up by general practitioners, however further research work in this area is necessary in order to study this feature.

Adherence to guidelines within the regularly followed up group has been particularly disappointing in areas related to patients' participation in their treatment (88% of patients do not have a self-management plan, 90% do not own a peak-flow meter), patient education and compliance with long term inhaled steroid use (44% of patients kept the same level of inhaled steroids when they were symptom free). This is consistent with results published in the literature where this area of patient care is inadequate in meeting published guidelines²¹⁻²³. Further research is needed to determine the reasons for the divergence observed. This could be due to gaps in guideline dissemination to physicians, or perhaps due to a lack of patient education. Patients may also be reluctant to participate in decision taking. Whatever the reasons, it is clear that much work needs to be done to promote adherence to the guidelines in order to optimise patient care. Careful planning and the use of promotional strategies should be adopted. The clinical phar-

Table 3: Summary of the outcome measures when comparing patients followed up regularly with those not followed up

Outcome measure	Regularly followed up % n= 97	Not regularly followed up % n= 164	Critical Value	Statistical Significance (p<0.01)
Steroid use on admission			20.1	Yes
No	7.2	31.1		
Yes	92.8	68.9		
Spacer device availability			24.27	Yes
No	30.9	62.9		
Yes	69.1	37.1		
Self management plan			7.3	Yes
No	88.7	96.9		
Yes	11.3	3.1		
Home peak flow monitoring				No
No	89.7	96.3		
Yes	10.3	3.7		
Compliance with inhaled steroids when asymptomatic			12.2	Yes
Stop treatment	27.9	48.6		
Reduce doses	27.9	29		
Same doses	44.2	22.4		

macist, as a member of a multidisciplinary team, is very well-placed to promote the implementation of suggestions and recommendations found in guidelines for asthma care.

Conclusion

The findings of this study indicate that regular physician review results in better asthma management when compared to published guidelines. However, despite regular follow up, certain aspects of patient care are inadequate when measured against the Malta asthma management guidelines.

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Conflict of interest: None

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Corinthia Group Prize in Paediatrics



This year's Corinthia Group Prize in Paediatrics was awarded to Dr Marie Zammit Mangion who obtained the highest marks in the combined fourth and final year examinations in Paediatrics. Dr Zammit Mangion also placed first, overall, in this year's final examinations. Whilst congratulating Dr Caruana for her achievement, we were also extremely grateful to the Corinthia Group for their stalwart support of the Academic Department of Paediatrics, including their ongoing commitment toward the Annual Prize in Paediatrics.

Photo: Dr Marie Zammit Mangion receiving a cheque for Lm100 from Dr Paul Vassallo Agius on behalf of the Corinthia Group