Impact of Optimal Asthma Education Programme on Asthma Morbidity, Inhalation Technique and Asthma Knowledge

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Abstract
Introduction: Optimal asthma education (comprising of information, self monitoring, regular medical reviews and a written action plan) significantly improves asthma management. The study was undertaken to assess the impact of optimal asthma education programme on asthma morbidity, inhalation technique and asthma knowledge.

Study Design: In non-randomized prospective trial asthma morbidity, (comprising of control of symptoms, unscheduled OPD visits and limitation of physical activities), inhalation technique and asthma knowledge were assessed before and one year after implementation of optimal asthma education programme.

Material and Methods: One hundred and seventy two patients of persistent bronchial asthma aged 12 years or more, taking daily anti-inflammatory drugs and having not attended any type of asthma education programme before were included in the present study.

Results: There was significant improvement in asthma morbidity with increase in the number of patients with intermittent and mild persistent asthma and significant decrease in patients with moderate and severe persistent asthma. Before optimal AEP, 30 (17.4%) patients had visited hospital thrice or more due to asthma sickness, after optimal AEP only 5 (8.6%) patients made unscheduled visits only once to hospital (p<0.05). Limitation of physical activities was present in 80 (46.51%) patients before AEP which was significantly reduced to 15 (8.7%) patients after optimal AEP (p<0.05%). Before AEP, inhalation technique was incorrect in 140 (81.3%) patients and after AEP none of the patients had incorrect technique (p<0.001). Only 24 (13.9%) patients had satisfactory knowledge of asthma before AEP and after AEP the number increased significantly to 120 (69.7%) (p<0.001).

Conclusion: Optimal asthma education is an integral part of asthma management which decreases asthma related morbidity, improves inhalation technique and asthma knowledge. Since our follow up was for one year and impact of asthma education programme is likely to decrease in absence of regular follow up, it is important to keep reminding patients about asthma education programme at each follow up visit.

Introduction
In spite of significant advances in the understanding of disease and its management, morbidity and mortality from asthma is still high. The important reasons for this are undertreatment with steroids, limited knowledge and poor asthma management skills among patients with severe asthma. Various management guidelines have been published to improve the management and minimize the morbidity from asthma. Almost all these guidelines recommend asthma education as a key component of management plans. Providing asthma education only in the form of information only (limited asthma education) does not lead to significant improvement in asthma management. In contrast, providing optimal asthma education programme, comprising of information, self monitoring, regular medical reviews and a written action plan, significantly improves asthma management. The present study was undertaken to study the impact of optimal asthma education programme (AEP) on asthma morbidity, inhalation technique and asthma knowledge.

Materials and Methods
Two hundred and twenty patients referred to asthma clinic of respiratory centre of armed forces hospital were enrolled in the study between Nov 2006 and Dec 2007. Study protocol was approved by Ethical Committee of hospital and informed consent was obtained from all patients.

Inclusion Criteria
Inclusion criteria included patients with persistent bronchial asthma, age of 12 years or older and the need to take daily anti-inflammatory drugs (inhaled corticosteroids) and having not attended any type of asthma education programme before. The diagnosis of asthma was confirmed by documenting a reversibility of >12 % and 200 ml increase in FEV1.

Exclusion Criteria
All current and ex-smokers with or without significant reversibility and cases with significant concurrent diseases were excluded from the study.
Study Design

In non-randomized prospective trial asthma morbidity (comprising of control of asthma symptoms, unscheduled OPD visits and limitation of physical activities), inhalation technique and asthma knowledge were assessed before and one year after implementation of optimal AEP. The study period was preceded by a run-in-period, during which optimum AEP was delivered and treatment was optimized for each patient. Patients were assessed for asthma morbidity by initially categorizing them into mild, moderate and severe persistent types as per GINA guidelines. Numbers of unscheduled OPD visits during the last one year were recorded. Limitation of physical activities was assessed by asking whether or not patients have been performing physical activities. This assessment was easier in serving personnel since it is mandatory for them to undergo daily physical training. In rest of the patients this assessment was made by asking routine physical activities like household chores in case of women and participation in games in case of children.

The inhalation technique of metered dose inhaler (MDI) with and without spacer, single unit dry powder inhaler (DPI) and multi dose DPI was checked personally by respiratory physician and was described as correct or incorrect. The asthma knowledge was assessed by administering a simple questionnaire in Hindi comprising of following ten questions:- 1) What type of disease asthma is? 2) What are the symptoms? 3) What happens to the breathing tubes during asthma? 4) What types of medicines are available for asthma? 5) What is the importance of controller medicines in asthma? 6) Name some triggers? 7) What are the symptoms of impending exacerbation? 8) Which medicine to be used during acute attack and by which mode of delivery? 9) What do you understand by optimal control? 10) Can one lead a normal life in asthma? Satisfactory asthma knowledge was defined as having correctly answered five or more questions.

Optimum Asthma Education Programme

The optimum asthma education programme was conducted as weekly sessions during run-in-period and each patient was supposed to attend four sessions. Each session comprised of about half an hour lecture explaining the nature of disease, various symptoms of asthma, what happens to the breathing tubes during asthma, types of medication with special emphasis on the use of inhaled steroids, advantages of inhalation therapy, demonstration of correct use of inhalation devices, various trigger factors and how to avoid them, how to recognize impending asthma exacerbations and explaining the meaning of optimal control of asthma. Patients were instructed to bring their inhalation devices and all drugs prescribed at each follow up visit so that inhalation technique could be rechecked. The information was conveyed by a trained paramedical staff to a group of about fifty patients in a simple comprehensive language with the help of models, charts and video film. The patients were also encouraged to read the same information included in the OPD follow up book, which was designed at our centre. It was followed by an interactive session with respiratory physician during which queries from the patients were answered. The regular use of inhaled steroids was re-emphasized. Every patient was also given a written action plan consisting of recognition of impending symptom of exacerbation and its management by using reliever drug in the form of inhaler with spacer or nebulizer, increasing the dosages of inhaled steroids, use of oral steroids and the appropriate time to report to hospital. The treatment was optimized for each patient as per GINA guidelines. All drugs were supplied free of cost to patients since the treatment is free for entitled patients in service hospitals.

The follow up was fortnightly for the first two months and then monthly for the rest of the study period. During each follow up visit patients were assessed for asthma morbidity, asthma knowledge and inhalation technique during preceding two to four weeks. As far as possible, it was ensured that patients visit the same chest physician during each follow up visit.

The data was analyzed using chi-square test. Statistical significance was established at p < 0.05.

Results

Forty eight patients had irregular follow up and were excluded from the study. Finally 172 patients were included in the study (102 females and 70 males with mean age of 28 ± 12 years). Eighty-five percent of patients could neither understand nor read English.

Asthma Morbidity

Assessment of asthma morbidity comprised of control of asthma symptoms, unscheduled OPD visits and limitation of physical activities.

Control of Symptoms

There was significant increase in the number of patients with intermittent asthma (before AEP- 6(3.4%), after AEP-126(73.2%), p<0.0001) and significant decrease in the number of patients with mild persistent asthma (before AEP-56(32.5%), after AEP- 26(15.11%), p<0.05) and moderate persistent asthma (before AEP-100(58%), after AEP-20(11.6%), p<0.0001). There were no patients with severe persistent asthma after AEP.

Unscheduled OPD Visits

Before AEP 30 (17.4%) patients had visited hospitals, thrice or more due to asthma sickness. After AEP only 5 (8.6%) patients made unscheduled visits only once to hospital which was statistically significant (p<0.05).

Limitation of Physical Activities

Limitation of physical activities was present in 80 (46.5%) patients with moderate and persistent asthma before AEP which was significantly reduced to 15(8.7%) patients after AEP (p<0.05).

Inhalation Technique

Inhalation technique was incorrect in 140 (81.3%) patients before AEP and after AEP none of the patients had incorrect technique (p<0.001).

Asthma Knowledge

Only 24 (13.9%) patients had satisfactory knowledge of asthma before AEP, after AEP this number increased significantly to 120 (69.7%) (p<0.001).

Discussion

We have been running a weekly asthma clinic in one of the respiratory centers of armed forces hospitals since 2005. The optimal asthma education programme is delivered to a group of patients by paramedical staff, who have been trained to deliver all components of optimal asthma education except for written action plan for self management which is delivered by personal interaction with chest physician. While selecting
paramedical staff as asthma educators, good communication skill and congenial demeanor were considered as important criteria since these attributes result in increased patient satisfaction and better health.12,13 Since most of the patients attending asthma clinic reported very satisfactory treatment of asthma, we decided to assess objectively the true impact of asthma education on asthma morbidity, asthma knowledge and inhalation technique.

Before starting AEP, there were more patients with moderate and persistent asthma than with intermittent and mild persistent asthma. After optimal AEP there was a significant increase in the number of patients with mild intermittent and persistent asthma and significant decrease in the number of moderate and severe persistent asthma. Incorrect inhalation technique is one of the important causes of poor control of asthma. Various studies14-17 have shown incorrect inhalation technique of using MDIs in 24-67 % of patients. In our study, optimal AEP had a significant impact on the inhalation technique of various devices since none of the patients had incorrect inhalation technique after optimal AEP. This better control of asthma was obviously because of better drug compliance, especially the regular use of inhaled steroids and correct inhalation technique. Similar results have been brought out in a systematic review involving fifteen studies, which compared an optimal self management programme to usual care.18 We paid special emphasis on the use of inhaled steroids and correct technique of using inhalation devices in our asthma education programme since underuse of inhaled steroids and incorrect inhalation technique are main causes of poor asthma control19,20 and the same has been brought out in an earlier study in adult asthmatics in armed forces.17

The unscheduled OPD visits by asthmatic patients reflect poor asthma control. In the present study, unscheduled OPD visits decreased significantly after optimal AEP. This can be attributed to educating patients about self monitoring of exacerbation by symptoms and managing these exacerbations by modifying the dosages of drugs, especially controlled medication. Similar results were seen in randomized trials using optimal asthma education.21-23 We did not advocate the use of peak flow meter in assessment of symptoms because of cost factor, poor compliance with PEFR monitoring in the long term24 and various studies showing the similar results between symptoms based and PEFR based self monitoring.25-27

Poorly controlled asthma leads to limitations of physical activities. Over a period of time, patients adapt almost completely to these limitations by restricting physical activities. Unless specifically asked about restriction of these physical activities most patients, who would have been otherwise symptomatic on doing physical activities, report optimum control of asthma.27 A significant number of patients 80 (46.5%) in this study had limitation of activities, which was significantly reduced after optimal AEP. We stressed on continuation of physical activities while on treatment, so that patients can themselves assess their level of control by titrating the level of activities with symptoms. This helps in achieving real control of asthma, which leads to improved quality of life of patients.

Patients with asthma need information about the diagnosis, types of treatment available, rationale for the specific therapeutic interventions being recommended and strategies for avoiding factors that cause asthma symptoms.2 In our AEP, we provided patients with information about asthma, the format of which has been already outlined in material and methods. This information helps patients in achieving better control of asthma. In two studies,28,29 patients were randomized to usual care or an educational intervention comprising of basic introduction to asthma, prevention and control of asthma attacks, asthma medications, devices and how to use them, and avoidance of asthma trigger. There were fewer asthma related visits to emergency department and limited activities days for the intervention group in the initial four months after the intervention. In the present study a significant number of patients achieved satisfactory level of asthma knowledge after AEP, which led to better control of asthma.

To conclude, optimal asthma education is an integral part of asthma management which decreases asthma related morbidity and improves inhalation technique and asthma knowledge. Our asthma education programme had significant impact on asthma management till one year of follow up. Since the impact of AEP is likely to decrease in absence of regular follow up,7 it is important to keep reminding patients about education programme at each follow up visit especially about regular use of inhaled corticosteroids, correct inhalation technique and continuation of physical activities.

Limitations of study

Regular drug compliance is also affected by accessibility and affordability of drugs prescribed. Since in service hospitals all drugs are supplied free of cost to all entitled patients, this factor may have played an important role in regular drug compliance.

References

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