

Adherence Issues in Asthma

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In any chronic disease like asthma, the effectiveness of therapy depends on 'how good' the treatment is and 'how well' the patient takes it. Non-adherence maybe in form of omission of doses, incorrect medication, incorrect dosages or schedules, premature discontinuation of drugs, not following advice to avoid allergens and sub optimal inhalation technique. Unrecognized non-adherence decreases the effectiveness of asthma therapy. Non-adherence can result in an increased rate of illness exacerbation, hospitalization, emergency department visits and asthma related deaths. One hundred sixty eight patients and their guardians on follow up in pediatric asthma clinic were administered a questionnaire regarding adherence to anti asthma therapy. Non adherence of different forms was seen in up to 68% of patients. The purpose of this communication is to report the frequency of non adherence in patients with asthma and suggest remedial measures

Key words: *Asthma, Adherence, Inhaled medications.*

There has been an increased prevalence of asthma in the past decade both globally as well as in our country and with that has come the recognition of the magnitude of morbidity it entails(1,2). Missed school days, increased hospitalizations, retarded growth and even

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death may result from a deficient management of these children.

In any chronic disease the effectiveness of therapy depends on 'how good' is the treatment and 'how well' the patient takes it. Effective treatment options (inhaled medications) are now available which when properly used help in decreasing morbidity associated with asthma and improving the quality of life of the children. However, there is a big barrier from the prescription pads to therapeutic effectiveness in the patient. Since the outcome of treatment plans works only as well as the patient adherence to therapy, it is worthwhile to look at how well the patient is following what we tell him.

Adherence to medication can be defined as the degree to which use of medication by the patient corresponds with the prescribed regimen(3). Adherence is influenced by diverse and complex factors including the eccentricities of human behavior and is difficult to predict even in the same patient at different times. Adherence in asthma alternates even in the same individual between fully adherent when symptomatic to non-adherent when asymptomatic. Adherence pattern also differs at different times for different drugs. Non-adherence may be in form of not fulfilling prescriptions, omission of doses, incorrect medication, incorrect dosages or schedules, premature discontinuation of drugs, not following advice to avoid allergens and suboptimal inhalation technique(4-6).

It is conservatively estimated that 50% of medication dependent patients of chronic diseases do not follow prescribed regimens(4). Studies in asthma using electronic monitoring

devices attached to Metered Dose Inhalers (MDIs) record rate of medication use of about 50% only(7,8). In UK, Coutts, *et al.* examined patient adherence to anti-inflammatory therapy using electronic monitoring and noted under use of inhaled corticosteroids on 55% of study days(7). In another similar study by these authors in preschool children, complete adherence was seen only on half of the study days and only 77% of prescribed doses were taken over the 2 month period(8).

We had an impression that the extent of non-adherence to treatment regimens in children with asthma was high in Indian families. To estimate the extent of the problem and improve our health education strategies, we conducted a study of adherence to asthma therapy in our clinic patients and came across some alarming facts.

Subjects and Methods

Children with asthma (n = 168) and their parents were interviewed regarding their practices about following prescriptions during last four weeks of therapy. Information was recorded on a questionnaire. Besides asking conventional questions, some probing was also done regarding number of doses used for inhaled medications, maintenance of daily asthma diary, number of inhalers purchased, presence or absence of financial constraints, their conviction regarding usefulness of therapy and use of alternative therapies. No special devices or laboratory tests were used to measure the inhaler use or drug metabolite excretion.

Results

We found that all types of non-adherent behavior is rampant. Results are presented in *Table I*.

Almost two third of the patients were taking medications at incorrect doses as

compared to those advised. Half of the patients had a deficient technique and more than one third were substituting the two categories of medications. Most of the children had multiple types of non adherent patterns.

Discussion

Adherence to medication in asthma also seems to be related to wide range of diverse factors like age and sex of the patient, financial status of the family, cultural beliefs, educational level of the parents. Duration of disease and disease severity are also important in determining the adherence to asthma treatment. Shrunk, *et al.* followed adherence in patients enrolled for CAMP trial and found adherence problems to be greater in patients who had been longer in the trial(9). Adherence behavior is also affected by patient's perception of his or her disease and parental concerns about safety of corticosteroids(10).

Type of medication used, dosing schedule, improvement of symptoms with medication also affect adherence to asthma therapy. Few

TABLE I—Types of Nonadherence in PGI Asthma Clinic Population (n =168)

S No	Type of non adherence	%age of patients
1	Failure to fulfill a prescription fully	30
2	Taking an incorrect dosage	64
3	Taking medication at an incorrect dosing interval	60
4	Premature discontinuation of anti inflammatory medication	40
5	Use of incorrect administration technique specially in relation to inhalation therapy	54
6	Taking medication for wrong reason e.g. bronchodilators for antiinflammatory effect	34
7	Substitution of one drug for the other	35
8	Not taking additional precautions advised with therapy	68

other concerns arise about adherence in children. Since the responsibility of giving medication lies with the parents, children from troubled families may find it difficult to adhere to therapies. At an older age the adolescent may be rebellious and detest medication. They may feel stigmatized and conceal medication.

Non-adherent behavior can broadly be classified into the following broad categories (Table II).

Erratic non-adherence. Doses are missed because of forgetfulness, changing schedules or busy lifestyles.

Unwitting non-adherence: Some patients may be inadvertently non-adherent because they have failed to understand fully the specifics of therapy or necessity for adherence.

Intelligent non-adherence: Sometimes patients alter, discontinue or even fail to initiate inhaled corticosteroids (ICS) treatment. Patients who feel better may decide that they no longer need to take prescribed medications(3).

Patterns of nonadherence like drug holidays (a period of 3 or more drug free days

often associated with interruptions of daily habits like weekends or holidays) and white coat compliance (improvement in compliance several days before a scheduled medical visit) have been described(6).

Unrecognized non adherence decreases the effectiveness of asthma therapy. Non-adherence can result in an increased rate of illness exacerbation, hospitalization, emergency department visits and asthma related deaths(11,12). Further if non-adherence goes unnoticed, medical decisions may be compromised and patient may be exposed to potentially detrimental and costly changes in therapeutic regimen. For example, the treating physician may hike the dose of the drugs, add a new drug or order fresh investigations to look for alternate causes in view of persisting symptoms(11).

Promoting adherence

1. *Clinician patient relationships:* Nothing is more important in promoting adherence to medication than a sound patient clinician relationship(13). The key to establishing this relationship is open communication, which clinicians foster by demonstrating

TABLE II—Forms of Nonadherence and Suggested Remedial Strategies

Forms of non-adherence	Remedial strategies
Erratic non-adherence	Simplification of regimen Establishing new habits through linking (Keeping MDI next to a tooth brush, matching medicines to meals, TV shows etc.). Cues and memory aids (Bright red stickers with written instructions)
Unwitting non-adherence	Clear unambiguous written instruction by doctors, nurses and pharmacists Patients education about medication and hands on training Improving parent doctor communication
Intelligent non-adherence	Effective open ended communication between parent and doctor with active parental participation. Tailoring regimens.

attentiveness, giving encouragement, active conversation, and eliciting and allaying patient concerns. By using these open communication skills and listening carefully, the clinician may uncover personal beliefs or concerns that may affect adherence(14). If the patient knows, likes and trusts his doctor he or she is most likely to be motivated to be adherent to the therapeutic regimen.

2. *Prescribing strategies:* Most individuals will prefer not to take any medication. If medication is needed they will take the least amount and for the shortest period possible. Medication, which needs to be taken once or twice daily, is better adhered to(15). Patients' preference also needs to be kept in mind when prescribing. Adolescent boys would not like to carry along a MDI with spacer but might adhere if a dry powder inhaler that can be securely pocketed is prescribed. Also, in the context of developing countries cost may be important issue that can limit adherence(16).
3. *Patient education:* Patient education aims to alleviate patients and caregivers' knowledge and skills about asthma. The basis of this approach is the belief that patients who are more knowledgeable about their disease and the treatments being used are more motivated and more likely to adhere to an asthma treatment plan. Issues, which need to be part of these education plans and should be addressed with the patient and his/her family, should include information on nature of the disease, nature of treatment and how to use treatment(17). Patients need to be educated on possible allergens and triggers and how to suitably modify treatment to avoid these. Recognition and management of exacerbations and development of self-monitoring

and self-assessment skills(15). An individualized asthma action plan needs to be discussed and negotiated with the patient.

Information about the basic pathophysiology of asthma is the foundation of patient education. Patients should be informed as far as possible in their own language that asthma is a chronic disease and inflammation is the primary mechanism that occurs in asthma attack. Patients who are able to monitor response to therapy may be more inclined to be adherent to asthma treatment. PEFr monitoring is a technique that may be used, however it is essential that patient be adequately instructed on how to use this device.

Patients should also be made familiar with environment control strategies. In addition to assisting patients in establishing priorities and explaining how to implement environmental controls, the clinician should explain the rationale for these measures.

Last but not the least patients should be educated about their medication; the information should encompass mechanism of action, expected outcome of treatment, importance of correct technique, common and serious adverse effects of each medication. It is very important that the patient understands which medications are prescribed for immediate relief and which are for longterm control. Further since adherence with medications that do not have a immediate benefit is poor, the long-term benefits of controller medication should be emphasized. Because parents may have concerns regarding long-term use of corticosteroids, special effort must be made to address them(9).

Written instructions which are culturally appropriate and suited to patient's literacy level should be a core part of every interaction with the patient(17). In patient encounters, the clinician's presentation style should be altered as needed to address patient age, education level, culture and ethnicity. A one to one verbal communication with the patient, including demonstration of recommended devices is an important component of patient education. Ideally the patient should be provided the opportunity to demonstrate their skills and understanding of these devices after the education session.

Informational audiotapes, videos and computer software may be used an adjunct to patient education(18).

Educational efforts should also be individualized to the patient. Patient concerns or beliefs about asthma need to be addressed. Ideally the primary clinician should introduce the key educational messages. This message needs to be reinforced by nurses, pharmacists and other health care professionals. If a team approach is used it is important that each member gives a consistent message.

4. *Behavioral strategies:* Behavioral strategies include use of techniques like reminders, reinforcement, monitoring, changing health beliefs and contracting to influence non-adherent behavior(2). These strategies should be followed in day-to-day practice for maximal patient adherence(17).
 - Reminders have a well-substantiated role in behavior therapy. They have been documented to be useful in maintaining adherence in asthmatic children both in an asthma clinic setting and asthmatic children followed as outpatients after

rehabilitation. An occasional phone call by the physician can have a rejuvenating influence on patients adherence and motivation.

- Tailoring refers to molding the desired regimen to meet patient demands. Tailoring entails modifying treatment plans to suite every patient.
- Reinforcement refers to any consequences that increase the possibility of a behavior being repeated. Positive reinforcement is giving the patient some incentive like praise, a small reward for a successful performance. It is a useful strategy and is a component of almost all behavioral programmes.
- Self-monitoring is a process of observing and recording ones own behavior. Asthma diaries, checklists or charts kept by patients are an important component of self-management programs. The patient records his behavior, evaluates it and then regulates it.
- Providing feedback to the patients regarding medication adherence is another useful clinical strategy.

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