

Morbidity pattern of children with asthma: A prospective study

Manandhar K¹, Bajracharya BL², Dhakal S³, Shrestha M⁴

¹Senior Medical Officer, ²Consultant Paediatrician, ³Medical Officer, ⁴Professor Paediatrics, Paediatric Department, Kathmandu Medical College

Abstract

Objectives: To determine the morbidity pattern of asthma in children attending the paediatric asthma follow-up clinic.

Materials and methods: Longitudinal prospective follow up of hundred and four patients, diagnosed as asthma, over a period of 2 years was done. Regular follow up by the same person during each visit and proper supervision of standard treatment along with parental education regarding the asthma, was done.

Results: The mean age of children presenting with asthma was 6.7 years. Majority of children 49 (47.5%) were graded as mild persistent asthma. Fifty nine (56.7%) children were missing school more than 7 days per month. Family history was present in forty one percent of the children. Fifty seven (54.8%) children were taking significant amount of junk food and were undernourished. Significant reduction in school-missing days and Emergency Room visits was noted in these children during the follow up period.

Conclusion: Awareness of disease is an important aspect of asthma management. Proper treatment and follow up with emotional support and education of the care taker, about the asthma, can reduce the morbidity pattern of asthma in children.

Key words: Prospective study, longitudinal study, Asthma

Asthma is the most common chronic disease of childhood. It is defined as a chronic inflammatory condition of airways that is associated with increased responsiveness to a variety of stimuli. It has been reported, between 4 – 20% school going children in India suffer from asthma^{1,2}. It has a potential adverse effect on society in terms of morbidity, quality of life (physical activity, education, socialization and self esteem) and health care costs³. Children with asthma should be able to: SLEEP, LEARN and PLAY. If asthma is waking the family at night, if the child cannot play, if he or she is chronically missing school (and parents missing work) then asthma is not under control. The goal of asthma therapy is to prevent chronic and troublesome symptoms, maintain normal or near normal pulmonary function, maintain normal physical activity level (including exercise) and prevent recurrent exacerbation.

This prospective study was carried out to find out the morbidity pattern in children with asthma who were attending Kathmandu Medical College Teaching Hospital.

Materials and methods

This study was conducted at Kathmandu Medical College Teaching Hospital, in Kathmandu, Nepal. All consecutive patients, between the ages of 2-14 years,

attending the Asthma Clinic, during the period from April 2002 to November 2004 were enrolled in this study. Follow up was continued till the end of November, 2005.

The selected questionnaires were used from the International Study of Asthma and Allergies in Childhood⁴ along with the standard history and full examination for diagnosis of asthma. The grading and management of asthma of the patients were done according to National Asthma Education and Prevention Program⁵.

A full explanation was given to the parents and a performa consisting of special questionnaire was filled during enrolment. Parents were explained about the two categories of asthma medications, one for quick relief and another for long term control. Prophylactic anti-inflammatory medicines / leukotrine derivatives were used.

Correspondence

Prof Moon Shrestha
P O Box- 8975 EPC 986 Kathmandu, Nepal
E-mail: moonmshrestha@hotmail.com

Parents were advised and stressed upon the importance of daily use of preventive medicine even when the child is not having any symptoms. Quick relief medications were to be taken when symptoms arise, or in case of exercise induced asthma, five to 30 minutes before taking part in sports. These were bronchodilators (or rescue medications). Bigger children were told to carry their rescue inhaler wherever they go, including school. Demonstration of how to take medicine (inhaler/with spacer or mask and rotahaler) was done in the beginning of therapy and also depending on the need during the follow up period.

Education for school children and caregivers was focused on the identification and avoidance of triggers, understanding the uses of prescribed medications and the importance of compliance and regular asthma clinic visit, as well as the proper use of inhalation devices.

Peak flow of children aged 5 years and more was measured with Vitalograph Peak Flow Meter and result interpreted by using Peak Flow Chart⁶. Anthropometry (height and weight) was done at the time of enrolment and repeated in every 3 months during follow up visit. Nutritional status was also assessed at the same time. As most of the patients were taking junk food, parents and bigger children were given simple dietary advice. Deworming was carried out at 6 month interval in children more than 2 years age.

Children enrolled in the study were scheduled for regular follow up visit during a weekly asthma clinic. In order to emphasize the importance of regular visit, improve attendance and proper evaluation, telephonic reminders were sent before their clinic appointment dates. At the clinic visit, detailed history was taken using standardized form, designed to elicit asthma severity, triggers and exposure. They all had full physical examination done as well.

The patients were followed up at different interval depending upon the condition, compliance and distance from where they come. Thus average follow up period ranged from 1 week to 3 months. On each visit, parents/ patients were asked about sleep disturbances, bronchodilator requirements, feeling of

well-being, emergency room visits and frequency of school missing. Parents were asked about how confident they felt regarding the treatment of their children after they started to visit asthma clinic.

Results

One hundred seventeen patients were enrolled. Thirteen patients were lost to follow up. One hundred four patients could be followed up for total study period. There were 71 male and 33 female patients. Male to female ratio was 2:1. Age range was from 2 to 14 years with mean of 6.7 years. Thirty five percent of the patients were less than 5 years of age. Thirty children (28.8%) had first attack of asthma before the age of 1 year. Fifty seven (54.8%) had first episode of asthma between 1-5 years. Remaining 17 children (16.3%) had onset between 5-10 years of age (Table 1).

Thirty two children (30.7%) had mild intermittent asthma, 49 (47.3%) were graded as having mild persistent asthma and 23 (22%) had moderate persistent asthma (Table 2). Fifty nine (56.7 %) children were missing school more than 7 days (maximum up to 10 days) per month, 24 (23.0 %) were missing 2 - 7 days per month, 12 (11.6%) had not missed school and 9 (8.7 %) were not yet of school going age (Table 3).

Forty three (41.4 %) enrolled children had positive family history of asthma (Table 4). About 57 (54.8 %) children were taking significant amount of junk food (Table 5).

One year after counselling, dietary advice and treatment according to the grading of asthma, we found an obvious decrease in the frequency of emergency visit and improvement in school attendance (Table 6, 7). Regarding the confidence of the parents about the treatment of their children after they started to visit asthma clinic, we found that almost all parents, except those with poor compliance, felt they were quite confident than before and could manage their children at home which avoided unnecessary emergency visits. Drug compliance was poor in about 12 children, of which, 7 mild persistent and 5 were moderate persistent group.

Table 1: Age of first attack of asthma

Age of first attack	Number	Percent
< 1 year	30	28.8
1-5 years	57	54.8
5 – 10 years	17	16.4

Table 2: Grading of asthma

Grading	Number	Percent
Mild intermittent asthma	32	30.7
Mild persistent asthma	49	47.3
Moderate persistent asthma	23	22.0

Table 3: Missing school before treatment

Missing school in days /month	Number	Percent
> 7 days	59	56.7
2 – 7 days	24	23.0
No missing school	12	11.6
Not yet gone to school	9	8.7

Table 4: Family history of asthma

Positive family history of asthma	Number	Percent
Yes	43	41.4
No	61	58.6

Table 5: Junk food intake

Taking junk food	Number	Percent
Yes	57	54.8
No	47	45.2

Table 6: School missing before and after the treatment

Days of school missing	1 year before treatment	1 year after treatment
More than 7days /month	59 (71%)	10 (12%)
2 – 7 days /month	24 (29%)	2 (2.4%)

Table 7: Average number of visit to Emergency Room

Grading	No of children	Before 1 year	After 1 year
Mild intermittent	32	1 per month	None
Mild persistent	49	3.2 per month	0.1 per month
Moderate persistent	23	2.3 per week	0.2 per week

Discussion

We are not aware of any previous longitudinal prospective follow up study of asthmatic children reported from Nepal. Asthma can result not only in impaired lung function of inadequately treated patients, but also in impaired quality of life for the sufferer. Despite excellent treatments available, the surveys on asthma revealed that asthma control is often suboptimal⁷. Optimal asthma control has been defined as the presence of minimal or no symptoms, no emergency visits, minimal need for reliever drugs, no limitation of activities, normal or near normal lung function, less than 20% variation in peak expiratory flow and minimal or no side effects⁸.

Asthma is given as the reason for a school absence in high percentage of children.⁹ These authors also confirmed that asthma was most frequent reason for children missing school for > 5 days. Our study showed that about 56.7 % of children were missing from school for 7 days or more.

One of the major components of asthma management is patient education and is critical to success of asthma management¹⁰. So, the knowledge gap among the patient/parents as well as their paediatricians has emerged as the most important factor contributing to suboptimal control of asthma. Patients are not aware that asthma is an inflammatory disease of the airways, that drugs are now available to check this inflammation. They even do not understand that feeling better only is not the optimal control of asthma and only the reliever medicines are not effective in control of asthma. Inhaled corticosteroids are currently the most effective anti-inflammatory drugs available in the management of asthma. By reducing inflammation, inhaled steroids reduce the need for rescue bronchodilator therapy and hospitalization, improve pulmonary functions, reduce bronchial hyper-responsiveness¹¹ and reduce deposition of collagen and tenascin in the airway mucosa¹².

In our study we found an obvious improvement in patient's wellbeing after starting the treatment and dietary advice. Reduced compliance with inhaled therapy for asthma relative to orally administered therapy has been reported¹³. However, we found poor compliance in taking medicines in 12 (11.6%) of the patients. Due to poor drug compliance, 3 (2.5%) parents/children defaulted and went for 'doctor shopping' and finally came back to our asthma clinic. The main reason for poor compliance were multiple, such as unacceptable inhaler therapy, denial of the diagnosis and cost involved in the therapy. Poor compliance is a major problem in paediatric asthma

management, and several factors play a role in this. These include the route of administration (oral therapy is preferred to inhaled medication)¹⁴, frequency of dosing (once or twice daily regimens are preferred), medication effects (a slow onset of action and long duration on discontinuance have poor adherence rates) and the risk or concern of side effects. The partnership between a person with asthma and their health provider is the core component of what is commonly thought to be necessary for high quality asthma care.

Conclusion

Though modern and simple effective treatments for asthma are available nowadays, the disease does not seem to be controlled in optimal level. The reason for continued suffering include that our management strategies are not easily understood by the patient/parents without a simple and careful approach towards this step. Eliciting common concerns and fears is the single and foremost strategy to develop a relationship of trust with patient/parents. Making them understand about the chronic nature of asthma, need for a long term care approach, how to handle the acute attacks and good inhalation technique are some of the important areas we should be educating the patient/parents to decrease the morbidity pattern of asthma. As shown in this study, a regular follow up clinic can reduce the number of school missing days and frequency of Emergency Room visits.

Acknowledgements

We thank Prof. D. S. Manandhar and Prof. M. R. Baral for helping us to conduct this Asthma Clinic.

References

1. Chhabra Sk, Gupta CK, Chhabra P, Rajpal S. Prevalence of bronchial asthma in school children in Delhi. *J Asthma* 1998;35:291-6
2. Awasthi S, Kalra E, Roy S. Prevalence and risk factors of asthma and wheeze in school-going children in Lucknow, North India. *Indian Pediatr* 2004; 41: 1205-10.
3. Fuhlbrigge AL, Adam RJ, Guilbert TW et al. The burden of asthma in United States: level and distribution are dependent on interpretation of National Asthma Education and Prevention Program Guidelines. *Am J Respir Crit Care Med* 2002; 166: 1044-49
4. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema: ISAAC. The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. *Lancet* 1998; 351:1225-1232

5. National Heart Lung and Blood Institute. NAEPP Expert Panel Report. Guidelines for the Diagnosis and Management of Asthma – Update on Selected Topics 2002, downloaded from www.nhlbi.nih.gov/guidelines/asthma/execumm.
6. St George I M, Reid J J, Grimmond B B, Morton R M: PEFr in Dunedin children aged 5-15 years. *N Z Med* 1982. 95: 597.
7. Rabe KF, Vermeire PA, Soriano JB, Maier WC. Clinical management of asthma in 1999; The asthma In sights and Reality in Europe (AIRE) study. *Eur Respir J* 2000, 16: 1-6.
8. Global Strategy for Asthma Management and Prevention. NIH Publication No 02-3659 Issued January, 1995 (updated 2002). Management Segment (Chapter 7): Updated 2004 from the 2003 document. Downloaded from www.ginasthma.org.
9. Doull I, Williams A, Freezer N, et al. Descriptive study of cough, wheeze and school absence in childhood. *Thorax* 1996;51:630 - 631
10. Gupta A, Gupta R. Importance of patient/parents education in childhood asthma. *Indian J Pediatrics* 2001, 68: 53-64.
11. Blais L, ernst P, Boivin J-F, Suissa S. Inhaled corticosteroids and the prevention of readmission to hospital for asthma. *Am J Respir Care Med* 1998, 158: 126-132.
12. Laitinen A, Altraja A, Kampe M, Linden M, virtanen I, Laitinen LA. Tenascin is increased in airways basement membrane of asthmatics and decreased by an inhaled steroid. *Am J Respir Crit Med* 1997, 156: 951-958.
13. Kelloway JS, Wyatt RA, Adlis SA. Comparison of patients' compliance with prescribed oral and inhaled asthma medications. *Arch Intern Med* 1994; 154 (12):1349 – 1352
14. Ehrlich RI, Du Toit D, Jordaan E, Zwarenstein M, Potter P, Volmink JA, et al.: Risk factors for childhood asthma and wheezing. *Am J Respr Crit Med* 1996; 154 : 681 – 8