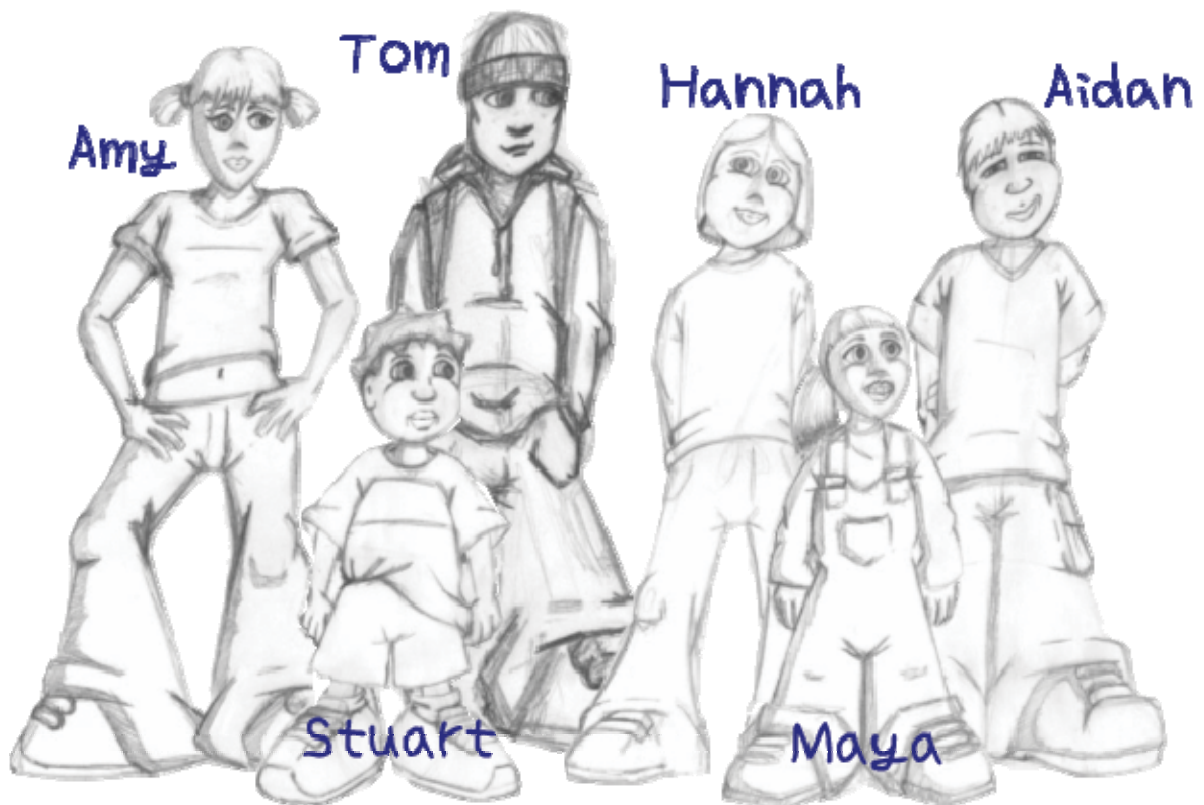


Asthma Attack

Targeting Emergency Asthma Contacts in Children

Executive Summary



EXECUTIVE SUMMARY

Title: Asthma Attack – Targeting Emergency Asthma Contacts in Children

Project number: P01/3

Principal Grant Holder: Dr. James Y. Paton
Reader in Child Health
Department of Child Health
Royal Hospital for Sick Children
Yorkhill
Glasgow G3 8SJ

Co-applicants Dr. Ron Neville
Gaylor Hoskins
Colin McCowan
Dr. Somnath Mukhopadhyay
Dr. Jack Beattie

Research Officers: Anne-Marie Love
Mark Stewart

Project Support Officers: Jenny MacDonald
Barbara Smith

Telephone: 0141- 201- 0237
Fax: 0141- 201- 0837
E-mail: j.y.paton@clinmed.gla.ac.uk

Date of submission: May 2005

The project was funded by NHS Quality Improvement Scotland

INTRODUCTION

Asthma is the commonest chronic childhood disease in Scotland and acute asthma exacerbations are the commonest reason for children to be admitted to hospital. Nowadays, with efficient medical treatment many children with acute asthma presenting to secondary care can be managed without needing admission to hospital.

The fact that many children can now be managed in emergency departments might be thought to reflect better, more effective medical care. However, the limited data available suggests that there are currently some important deficiencies in the management of acute asthma in emergency departments, particularly in respect of illness severity assessment and discharge planning. Improvements in these areas might reduce future emergency attendances for asthma and decrease ongoing asthma morbidity. Because of the large numbers of children attending hospitals with acute asthma this is an important area to target.

The present project

Managing an acute asthma exacerbation in children within the emergency department can be broken down into three key stages:

1. Managing the first 4 hours in the emergency department
2. Getting through the next 24 hours after discharge home
3. Planning for future attack management and prevention

This project was aimed at stages 2 and 3 above. The goal was to make use of the few hours families spend in the emergency department during an acute asthma exacerbation to give asthma advice and education based on current asthma guidelines.

Overall aims of the project

The aims of the project were:

1. To investigate whether children presenting with asthma attacks and who might benefit from asthma management education could be identified and labelled correctly while they were in the emergency department
2. To investigate whether the brief window of opportunity following an emergency contact, during the initial stages of asthma management, could be used to provide guideline-based, tailored education and advice to parents about attack management and prevention
3. To gauge whether such advice could be delivered reliably in daily clinical practice within an emergency paediatric unit. If so, to investigate whether parents were assisted by the information given and whether it facilitated successful resolution of the acute attack and encouraged a return to scheduled asthma care and follow-up with their GP.
4. To evaluate whether education about asthma attack management and feedback during these initial stages altered subsequent asthma morbidity in terms of hospital admissions, emergency health care contacts, patient quality of life etc.

METHODS

Settings

The study took place in the short stay areas and paediatric wards of the Royal Hospital for Sick Children (RHSC), and Ninewells Hospital, Dundee.

Audit of Children Attending Emergency Departments

In order to assess the numbers of children presenting with acute asthma and whether they could be rapidly identified and given a correct diagnostic label while they were in the emergency department, two audits were carried out.

Specification and Development of Multimedia Education Programme

A key project goal was the development of a simple multi-media education programme focusing on asthma attack management which could be operated by the families themselves with minimal or no help from staff. Once the package was ready for use in the study, medical and nursing staff from the clinical areas and wards were taken through the contents of the educational package and the supporting written material and trained in its use.

Assessing the Impact of the Educational Intervention

Subject Recruitment

Recruitment took place between May 2003 and February 2004 and all families presenting with a child with an acute asthma exacerbation to the short stay ward at RHSC or to the GP Bay in Ninewells were eligible.

Telephone Interviews

Telephone interviews were used to investigate whether parents were assisted by the information given and whether it facilitated successful resolution of the acute attack. The aim was to complete a telephone interview 2-3 weeks after the attendance at the emergency department.

Retrospective Medical Records Review

To assess the effect of the educational project on longer term outcome, we collected information from the child's hospital & GP records about visits for asthma in the 12 months before and for the periods from 0 up to 6 months and from 6-12 months after the hospital attendance. Information was also collected on the child's asthma medications and the use of rescue courses of oral steroids.

KEY RESULTS

Audit of Children Attending Emergency Departments

In the first audit, 452 children presented to short stay in Glasgow with 619 episodes of asthma, wheeze or breathing difficulty; 259 children (57%) were discharged home from the Emergency department while 193 (43%) were formally admitted to a ward. This audit confirmed that the numbers of children presenting with acute asthma were large. In the second audit the notes of children over 1 year of age presenting with any respiratory symptoms or difficulty were reviewed. The initial diagnostic label was compared with the final diagnosis and was found to have a reasonably high sensitivity, specificity and positive predictive value for a final diagnosis of asthma. This suggested that the initial

diagnostic label was sufficiently accurate to be used for deciding to which children asthma education should be offered.

Specification and Development of Multimedia Education Programme

Educational Needs Assessment

15 qualitative interviews were carried out with parents and children. Parents were generally satisfied with the treatment they received, however, they reported that the information provided focused on immediate medical treatment.

Developing the Computer Package

Three core modules were defined that should be included in asthma educational materials for use in emergency departments. The detailed content of the 3 modules was discussed by the project team to ensure that the content was both in line with the British Guideline on the Management of Asthma published in 2003 (BTS/SIGN no. 63) [9] and took account of local practice.

Once defined, content was programmed using Macromedia Flash software. The final computer educational package was designed around a touch-screen interface. Animated cartoon characters guided the user through the material, explained what was happening and pointed out important information. The material was deliberately designed to be suitable for children and their families without having to read any instructions.

Pilot testing highlighted areas where the package worked well and where it needed to be improved. Existing printed asthma materials were revised and updated and new written materials developed to provide parents with information and advice that they could take home. Medical and nursing staff were trained in the programme's use.

Once an appropriate educational programme had been developed and staff trained in its use the main part of the project was to investigate whether it could be used successfully in practice, and whether it improved care and altered outcome.

Assessing the Impact of the Educational Programme

Subject Recruitment

Four hundred and sixty five children with acute asthma/wheezing attended and were eligible to be recruited (369 in Glasgow and 96 in Dundee). Of these, a total of 211 (45%) families were recruited to take part – 152 (41%) in Glasgow and 59 (61%) in Dundee. One parent in Dundee withdrew during the telephone contact leaving a final total of 210 children (152 in Glasgow and 58 in Dundee).

Telephone interviews

Telephone interviews with parents took place between May 2003 and May 2004. Telephone interviews were carried out successfully with 125 (60%) of 210 parents: 91 (60%) out of 152 in Glasgow and 34 (58%) of 59 in Dundee.

Of particular note, families were asked about their confidence in managing their child's asthma. In parents whose children were taking asthma medicines before hospital attendance (n=83), those reporting feeling very confident in day to day management rose from 42% to 70% while the proportion feeling confident about managing asthma attacks increased from 20% to 51%.

In the 125 families questioned, 42 had not previously been told their child had asthma. Twenty six were diagnosed as having asthma at the emergency attendance. Sixteen (62%) said they felt they would be fairly confident while 10 (38%) said they would be very confident managing their child's asthma from day to day. Eighteen (69%) said they felt they could spot the warning signs of an impending asthma attack in their child and when asked were able to list correctly which signs they would look for in their child.

Of the 125 families contacted, 120 had seen the computer package. Those who had seen the package generally rated it highly with 86 (72%) saying it was very good, 33 (27%) rating it as good and only 1 (1%) saying it was "ok". In addition, 98% said they found the package easy to use while 99% said it was easy to read and understand.

Retrospective medical records review

In order to investigate the longer term asthma morbidity after the educational intervention, the hospital and GP records were reviewed.

Only 70 (35%) patients had visited their GP within 7 days (the period recommended in current guidelines) compared with 129 (65%) who had not. Data could not be found in 7 children. When the time to visit the GP was extended up to 28 days, 104 of the 199 with data available (53%) had visited.

The GP records showed a shift from no or intermittent reliever treatment (BTS Step 0 or 1) to regular inhaled steroid treatment (BTS step 2) or steroid treatment combined with a second preventive treatment (BTS step 3) in the first 6 months (from 0 up to 6 months) following hospital attendance. The GP records also showed evidence of a decrease in the percentage of children having no emergency visits after the hospital visit.

Finally, data on emergency hospital attendance for asthma were available for all 205 children for the 12 months before and 6 months (from 0 up to 6 months) after the index visit. Emergency visits to hospital were not common. One hundred and 59 children (77%) had had 0 visits while 31 (15%) had 1 other than the index visit. The remaining 15 children (8%) had more than one visit with the most being 5 (1 child). There was essentially no change in the percentage of children coming to the hospital emergency departments in the initial 6 months (from 0 up to 6 months) after the index visit. Seventy three children had data available for a period of one year before and one year after the index visit. The percentages of children having 0 visits increased slightly while the number having 1 decreased slightly. However, the total number of visits changed little (23 vs. 28).

Acute asthma attacks severe enough to require attendance at hospital are by their nature uncommon events. Emergency GP attendances might be expected to be somewhat more frequent and might show more evidence of change. Overall, there were 146 visits in the year before and 113 in the first six months following. In those with data for all three time periods there were 23 visits in the year before compared with a total of 30 in the year after (16 & 14 for each consecutive 6 month period - from 0 up to 6 months and from 6 up to 12 months). The data suggested an increase in the percentage having no emergency GP visits principally because of a decrease in the percentage of children having 2 or more visits.

Data on steroid courses was collected from the GP notes. The data is limited but there was an increase in the percentage of children receiving no courses of oral steroids following the index attendance.

This data provided some evidence for an increase in preventive treatment and a decrease in emergency asthma care within general practice for the period after the hospital attendance. Although the evidence is highly suggestive, because of the absence of an appropriate control group we are unable to conclude with certainty that the educational intervention led to the observed improvements in morbidity.

CONCLUSIONS

We developed a multimedia computer based asthma education programme and showed that it was practical to deliver asthma education to families of children with acute asthma during the short period families spend in the emergency departments. The education they received was based on current asthma guidelines and focused on key points in the acute management of asthma. We also established that children with asthma attacks could be recognised and appropriately targeted for education during their short stay in the emergency department. Once the computer education package had been incorporated into staff work practices, we were able to deliver asthma education to families who would previously have received either limited or no asthma education. The asthma education delivered by the computer programme was of high quality and was delivered consistently without any increase in staff. Using a multi-media computer programme to deliver the education proved surprisingly popular with parents and children, and their feedback on the educational materials developed was generally very positive. Although a rigorous evaluation of the impact on asthma outcomes of the education provided was not possible due to the lack of a control group, the outcome data available pointed towards improvements in asthma care and reduction in asthma morbidity in the months following attendance at hospital.

This work should be set in the framework the MRC has proposed for the development and testing of complex interventions to improve health. The stage is now set for a more formal objective assessment of the programme's impact on asthma outcomes using a randomised control trial.