

Knowledge of Childhood Asthma among Medical Students

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Childhood asthma is a common disease in children with prevalence varying from 4.9% in Kota Kinabalu,¹ 13.8% in Kuala Lumpur,² to 10% in Kelantan.³ Bronchial asthma is often inappropriately managed and preventive medications under utilized.^{4,5} Since medical students are future health care providers for the country it is important that they acquire an adequate knowledge of childhood asthma and its management before graduation from medical school.

The School of Medical Sciences at University of Science Malaysia in Kelantan, Malaysia has a problem based integrated curriculum.^{6,7} The teaching of basic science and clinical subjects is integrated in a 5-year course. There is a spiral learning process,⁸ in which students are exposed to topics on numerous occasions and early clinical contact enables them to test their knowledge against a clinical scenario. In the first year, the integration is based on organ systems and emphasis is on normal structure and function. Problem-

SUMMARY As future health care providers medical students should acquire an adequate knowledge of bronchial asthma before graduation from medical school. The aim of this study was to assess whether knowledge about childhood asthma increased during the medical course. The 590 medical students enrolled in the School of Medical Sciences, University of Science Malaysia during the 1995/96 session were studied utilizing a validated questionnaire. There was a significant increase in the mean total scores from 11 (95% CI 10.5-11.6) in Year 1 to 23.4 (95% CI 22.9-24) in Year 5. Questions about symptoms of asthma, pathogenesis of airway narrowing during acute exacerbations, preventive and reliever medications, side effects of steroids, addiction to asthma drugs and assessment of severity revealed a progressive increase in knowledge over the five years. Among 5th year medical students 44.6% named infection and 65.1% named exercise as two common triggers of childhood asthma; only 30.1% could name two prophylactic drugs for asthma. Although the asthma knowledge of medical students increased progressively during the five year curriculum, their knowledge regarding trigger factors and preventive medications were deficient. As childhood asthma affects some 10% of Malaysian children its importance requires greater emphasis in the medical curriculum.

based learning is started in the second year of the program. Teaching about asthma is first introduced in the 2nd year of the curriculum when students undertake a six weeks respiratory block. During the respiratory block students receive a lecture on wheezing and a lecture on common drugs used in the management of bronchial asthma. A case scenario on wheezing is also presented during this block. Based on the case

scenario the students discuss in small groups the epidemiology, signs and symptoms, pathophysiology and management of asthma in three 2 hour sessions. Revision on bronchial asthma takes place in the 3rd year before the 2nd professional examination at the end of

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that year. Fourth and fifth year medical students have further exposure to asthma, during their rotational clinical postings in medicine and pediatrics. During these clinical rotations students have the opportunity to clerk patients with asthma admitted with acute exacerbations, or those attending out-patient clinics. During the fifth year a two hour seminar is conducted to discuss the management of acute severe asthma.

Thus one would expect knowledge about asthma to show a progressive increase over the 5 years of the medical course at University of Science Malaysia. The outcome measure of asthma knowledge used was a questionnaire which had been previously validated (Table 1).⁹ The aim of this study was to assess whether knowledge about childhood asthma increased during the medical course.

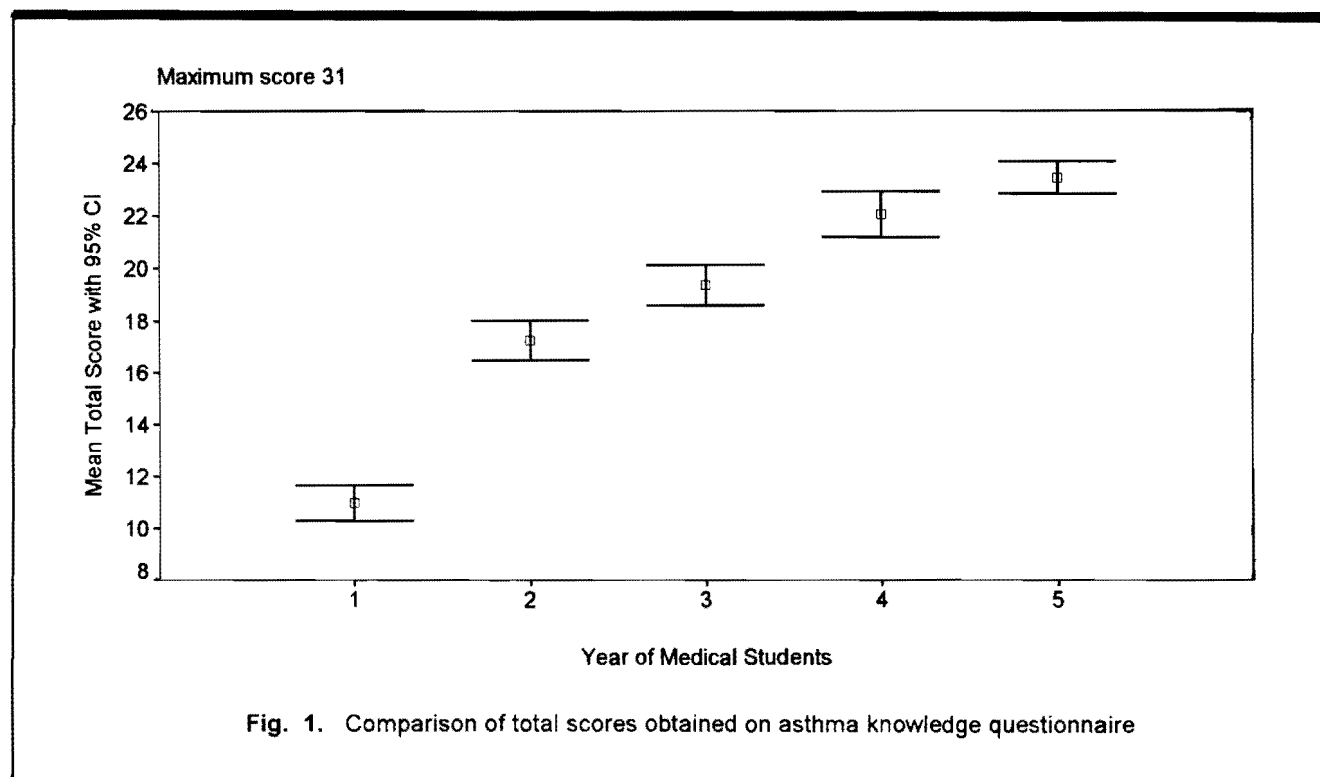
MATERIALS AND METHODS

The 590 medical students enrolled in the School of Medical Sciences, University of Science Malaysia during the 1995/96 session were invited to participate in the study. Questionnaires were distributed to all medical students following a lecture session. Consent was verbal and students who did not wish to participate in the study were asked not to answer the questionnaire.

The questionnaire was distributed at end of the academic year just before the professional examinations. At the time of questionnaire administration 1st year medical students had had no formal teaching on asthma. Second year medical students had finished the respiratory block where lectures and seminars on respiratory diseases and respiratory basic science

were given by physicians and pediatricians. A week in the respiratory block was devoted to diseases causing wheeze, including bronchial asthma. Fourth and 5th year medical students had completed seminars on asthma management. The importance of asthma was further emphasized in daily bedside teaching sessions during clinical rotations. The response rate for the questionnaire was as follows: Year 1 122 (83%), Year 2 92 (74.8%), Year 3 77 (66.4%), Year 4 61 (60%), Year 5 83 (87.4%).

The questionnaire was analyzed on a question by question basis and then by total score. The maximum total score was 31. Chi-square analysis was performed for each question to compare the differences between Year 1 and Year 5 students. A Kruskal-Wallis test was performed on total scores to compare differences between students' levels of knowledge in



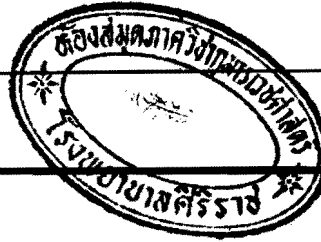


Table 1. Asthma knowledge questionnaire

Questions requiring a true/false response are marked (T/F)

- 1 What are the three main symptoms of asthma?
- 2 More than 1 in 10 children will have asthma at some time during their childhood. (T/F)
- 3 Children with asthma have abnormally sensitive air passages in their lungs. (T/F)
- 4 If one child in a family has asthma then all his/her brothers and sisters are almost certain to have asthma as well. (T/F)
- 5 Most children with asthma have an increase in mucus when they drink cow's milk. (T/F)
- 6 Write down all the things you know that cause asthma (sometimes called trigger factors).
- 7 During an attack of asthma the wheeze may be due to muscle tightening in the wall of the air passages in the lungs. (T/F)
- 8 During an attack of asthma the wheeze may be due to swelling in the lining of the air passage in the lungs. (T/F)
- 9 Asthma damages the heart. (T/F)
- 10 Write down two asthma treatments (medicines) which are taken every day on a regular basis to prevent attacks of asthma from occurring.
- 11 What are three asthma treatments (medicines) which are useful during an attack of asthma
- 12 Antibiotics are an important part of treatment for most children with asthma. (T/F)
- 13 Most children with asthma should not eat dairy products. (T/F)
- 14 Allergy injections cure asthma. (T/F)
- 15 If a person dies from an asthma attack, this usually means that the final attack must have begun so quickly that there was no time to start any treatment. (T/F)
- 16 People with asthma usually have "nervous problems". (T/F)
- 17 Asthma is infectious (i.e. you can catch it from another person). (T/F)
- 18 Inhaled medications for asthma (e.g. Ventolin metered dose inhalers, rotacaps) have fewer side effects than tablets. (T/F)
- 19 Short courses of oral steroids (such as prednisolone) usually cause significant side effects. (T/F)
- 20 Some asthma treatments (such as Ventolin) damage the heart. (T/F)
- 21 A 5-year old boy has an attack of asthma and takes two puffs of Ventolin from a metered dose inhaler. After 5 minutes he is no better. Give some reasons why this might have happened
- 22 During an attack of asthma which you are managing at home, your child is requiring the nebuliser (mask) every 2 hourly. He/she is gaining benefit but is very breathless after 2 hours. Provided that he/she doesn't get any worse, it is fine to continue with 2 hourly treatment. (T/F)
- 23 Write down ways of helping to prevent attacks of asthma during exercise.
- 24 Children with asthma become addicted to their asthma drugs. (T/F)
- 25 Swimming is the only suitable exercise for asthmatics. (T/F)
- 26 Parental smoking may make the child's asthma worse. (T/F)
- 27 With appropriate treatment most children with asthma should lead a normal life with no restriction on activity. (T/F)
- 28 The best way to measure the severity of a child's asthma is for the doctor to listen to his/her chest. (T/F)
- 29 Asthma is usually more of a problem at night than during the day. (T/F)
- 30 Most children with asthma will have stunted growth. (T/F)
- 31 Children with frequent asthma should have preventive drugs. (T/F)

Table 2. Questions in which a steady increase in asthma knowledge from Year 1 to Year 5. Percentage giving correct answers for each question

Year	1	2	3	4	5
Symptoms of asthma	1.6	38	48.1	70.5	68.7
Mucosal oedema during acute attacks	26.2	48.9	54.5	82	84.3
Two correct preventive agents	0	3.3	5.2	14.8	30.1
Two correct medications for acute asthma	1.6	25	22.1	68.9	96.4
Short course steroids do not cause significant side-effects	11.5	43.5	70.1	83.6	91.6
Addiction to asthma drugs does not occur	22.1	52.2	74	80.3	83.1
Listening to chest is not the best way of assessing severity	18	58.7	63.6	75.4	81.9

each of the five years. Statistical analysis was performed using the EPI6.0 (Centers for Disease Control, Atlanta) software for personal computers.

RESULTS

Fig. 1 shows the mean total scores with 95% confidence interval (CI) obtained for each year of the medical course. There was a significant increase in the mean total scores from 11 (95% CI 10.5-11.6) in Year 1 to 23.4 (95% CI 22.9-24) in Year 5 ($p < 0.0001$). Out of the total of 31 questions only two questions failed to distinguish the level of knowledge between Year 1 and Year 5 medical students, with a higher majority of first year students recognizing that during an attack of asthma the wheeze may be due to muscle tightening in the wall of air passages ($p = 0.59$), and that most children with asthma do not have stunted growth ($p = 0.89$).

Table 2 shows questions in which there was a steady increase

Table 3. Percentage of medical student responses about trigger factors for attacks of asthma

Year	1	2	3	4	5
Infection	1.6	14.4	16.9	49.2	44.6
Exercise	0	45.7	57.1	63.9	65.1
Allergens	35.3	87.0	92.2	91.8	95.2
Environment	55.7	97.8	97.4	93.4	98.8
Emotion	6.6	28.3	13.0	23.0	59.0
Drugs	0.8	28.3	16.9	39.3	29.0

in knowledge over each year of the course. For some other questions there was an abrupt increase in knowledge after the 1st year of medical school. These included responses indicating that most children with asthma can eat dairy products, allergy injections do not cure asthma, and that swimming is not the only exercise suitable for children with asthma.

Most first year medical students knew that asthma is usually more of a problem at night, is made worse by parental smoking, is not infectious, does not damage the heart, has a hereditary basis, is associated with abnormally sensitive air passages, and has airways muscle spasm during acute attacks.

Table 3 list the student responses about trigger factors for attacks of asthma, with allergy and the environment rated as more important than viral infections and exercise. Among 5th year medical students allergens and environmental factors were given by the majority as important triggers for asthma. However only 49.2% of 4th year and 44.6% of 5th year students named infection and 63.9% of 4th year and 65.1% of 5th year students named exercise as two common triggers of childhood asthma.

The question on prevention of exercise induced asthma was very poorly answered by students in all the 5 years. Only 24.1% of 5th year medical students could name two ways of preventing exercise induced asthma.

DISCUSSION

Knowledge about childhood asthma, as judged by the questionnaire, increased over each of the 5 years of the medical course. The average score of 1st year medical students was 11 (range 0-21) which was slightly lower than the mean scores of parents with low knowledge of asthma in Newcastle, Australia (mean 13.0 range 0-21).⁸ As first year medical students have no formal teaching in asthma, these differences in mean scores may reflect the differences in asthma knowledge between the two communities in Newcastle and Malaysia. Final year medical students also obtained a slightly lower mean score of 23.4 (range 17-31) than a group of 69 parents of asthmatic children with a high knowledge of asthma in Newcastle, Australia (mean: 25.3,

range 18-31).⁸ This suggests that final year medical students have scope for improvement in their knowledge about childhood asthma before graduation.

The progression of knowledge over the 5 years of the course provides useful information about the learning process. Although the respiratory block was completed in the 2nd year, the mean score of 3rd year medical students (mean: 22.0, range 14-27) was significantly higher than that of 2nd year medical students (mean: 19.4, range 13-27). Fourth and 5th year medical students did much better, especially in the therapeutic questions, indicating that more frequent clinical contact and application is important for consolidating knowledge.

The study reveals some concern about the knowledge of childhood asthma of final year medical students. Even although a satisfactory number (96.4%) of final year medical students could name medications used in the treatment of acute asthma, only 30.1% could name medications used for prophylaxis. This indicates a lack of appreciation of the importance of inflammation in the pathogenesis of bronchial asthma and the rationale for the use of prophylactic medications in the management of asthma. The role of anti-inflammatory medications as prophylactic agents merits increased emphasis in the undergraduate curriculum as they have been shown to be effective in reducing asthma morbidity in children.¹⁰ Final year medical students share similar views to "high knowledge" parents from Newcastle in naming allergens as the most common triggers of acute asthma attacks in children. It is only in the last year that the im-

portance of infection and exercise as triggers were stressed, but even then, only 44.6% named infection and only 65.1% named exercise as trigger factors. As viral infections and exercise are common triggers of childhood asthma, these aspects should probably be covered more thoroughly in the medical curriculum.

This study demonstrates that asthma is included at various stages in the medical curriculum, and that knowledge about asthma increases as the medical students progress through the problem-based medical course. However, the knowledge of asthma among final year medical students was only comparable to that of "high knowledge" parents from a developed country. Besides providing information about the gradual increase of asthma knowledge throughout the 5 year medical course the questionnaire also revealed several areas of deficiency in asthma knowledge among graduating medical students, especially in the use of preventive treatment and common trigger factors. These findings were unexpected in view of the inclusions of asthma at each stage of the undergraduate course. Feedback to teachers and increased clinic-based education will hopefully correct these limitations in future.

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