Decreasing asthma morbidity

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Apart from the optimal use of drugs, various supplementary methods have been tested to decrease asthma morbidity, usually in patients from relatively affluent socio-economic backgrounds. A study of additional measures taken in a group of moderate to severe adult asthmatics from very poor socio-economic backgrounds who had had on average only 5 years of schooling, is reported here. The additional methods were selection of patients who could successfully use a metered dose inhaler and prescription of other forms of administration for those who could not, with regular repeat checking of the techniques of aerosol use, use of theophylline blood level monitoring to improve the basis for discussing drug non-compliance with patients, and repeated explanation to patients why regular medication and clinic attendance are essential. These measures resulted in a significant improvement in morbidity, whereas no such improvement was found in a control group.

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Effective management of the chronic asthmatic requires more than the choice of appropriate drugs. Various additional methods have already been shown to be of benefit, including self-medication schemes, good information to ensure understanding, improvement of patient co-operation and efforts to improve compliance.[1] Efforts to give doctors special training to improve asthma control have also been made.[2]

In spite of all these efforts, control of asthma is still often problematic.[3] This is especially so in asthmatics from an underprivileged environment where poor education, adverse socio-economic conditions and a general lack of understanding of modern medicine prevails among many patients. In such a population, seen at Ga-Rankuwa Hospital, additional measures were introduced in a clinic mainly for moderate to severe chronic perennial asthmatics in an effort to improve compliance, patient understanding and co-operation, and decrease work absenteeism and morbidity.

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Methods

The records of asthma patients seen at two clinics at Ga-Rankuwa Hospital were analysed for this retrospective study. Because of high morbidity and frequent work absenteeism, we decided to introduce additional measures in one of the two clinics (called the experimental group) to try to decrease patient morbidity. (The other clinic was called the control group.)

Most patients from both clinics were from rural areas, and worked as farm labourers or domestic servants under poor socio-economic conditions. Most patients had not attended school at all or had attended only for a few years. Overall, both groups were comparable with regard to female/male ratio of patients, socio-economic status and average years of school attendance, medication used and average severity of disease. The measures introduced were as follows.

1. A specially trained nursing sister interviewed all patients at each visit before patients saw the doctor. The sister checked on the technique of metered dose inhaler (MDI) use by patients, repeatedly instructed patients on the correct use of MDIs and informed the doctor about particular patients who did not have the co-ordination skills necessary for the correct and optimal use of a MDI. Such patients were then prescribed powdered inhaled forms of medication, usually rotacaps. The sister also encouraged compliance constantly.
2. Patients were routinely prescribed a sustained-release theophylline preparation. Theophylline blood levels from the day of the visit were made available to the doctor to individualise theophylline dosage levels. The blood levels were, however, also used as an indication that compliance might be suboptimal; the doctor used the information to encourage compliance.
3. Patients were repeatedly informed of the nature of their disease and told that a cure was unlikely. It was explained that symptoms and associated complications are better controlled by regular visits and continued prophylactic treatment, even during periods when patients felt symptom-free.

The medication prescribed for both groups of patients before the introduction of additional measures was similar. All patients received inhalation β-stimulants at all times, oral β-stimulants were irregularly added in both groups, and all received a theophylline preparation, usually oxtriphylline, with one exception in the experimental and two in the control group. Inhaled beclomethasone was usually given, i.e. 85% versus 89% respectively in the experimental and control groups. Antibiotics, sodium cromoglycate and H_1-antihistamines were used only in isolated cases and sporadically. The two groups are thus comparable.

The severity of the patients' asthma in both groups was expressed as yearly morbidity scores which were then compared statistically (Table I). Comparisons were made of these average yearly scores obtained for 4 successive years. Data on patients from both groups who had attended the clinic for at least 3 years were used, in the experimental group for at least 1 but preferably 2 years before the introduction of the additional measures and at least 1 but preferably 2 years thereafter.

Table I. Morbidity scores used for the assessment of severity of disease in asthma patients

Hospital record description	Numerical score
Stable asymptomatic patients with no additional breath sounds or clinical flow obstruction	1
Intermittent chest tightness, coughing or wheezing, early morning 'dipping'	2
Severe discomfort or obstruction of air flow necessitating temporary addition of oral corticosteroids to bronchodilators with or without antibiotics (no intravenous therapy or hospital observation needed)	3
An acute attack necessitating up to 12 hours' hospital surveillance, intravenous aminophylline and hydrocortisone plus inhaled salbutamol, and resulting in significant improvement in distress and dyspnoea	4
An acute attack necessitating hospital admission (i.e. 12 hours in hospital surveillance after intravenous aminophylline, inhaled salbutamol and intravenous hydrocortisone without significant improvement of distress)	5

Average yearly scores obtained were as follows. A morbidity score value was determined for each individual visit of each patient. These score values were then tabulated for calendar months of the year. For each patient only the highest score for a particular month was tabulated. If no visit occurred during a month, no score was tabulated for that patient. Monthly scores were obtained separately for every patient for at least 3 but not more than 4 years. These monthly individual scores were then added up for individual patients and divided by the number of monthly scores for a particular year. Average yearly scores per patient were thus obtained. From these, average yearly scores were calculated for the two groups (Table II).

A statistical analysis compared the scores for each year with the scores for all other years within each group using the sign test or the Mann-Whitney test. In addition, corresponding years from each group were compared, i.e. experimental group of year 1 with control group of year 1, etc.

Table II. Morbidity scores of patients over a 4-year period

	Year 1	Year 2	Year 3	Year 4
Experimental group				
No. of patients	23	29	29	23
Average score and standard deviation	1,823 ± 0,525	1,801 ± 0,618	1,574 ± 0,425	1,499 ± 0,382
Control group				
No. of patients	13	25	25	25
Average score and standard deviation	2,19 ± 0,54	1,989 ± 0,522	2,036 ± 0,505	2,019 ± 0,577

Results

The results for the experimental group in respect of years 1 and 2, i.e. the 2 years before additional measures were introduced, showed no significant differences (Table II). Likewise no difference was found when years 3 and 4 were compared, i.e. after the introduction of the additional measures. However, when years 1 and 2 were each compared separately with year 3 a trend towards a difference was found, i.e. $P < 0,10$ but $P > 0,05$ in both cases. The differences between years 1 and 2 compared separately with year 4 were significant ($P < 0,05$). Comparison of the different years in the control group showed no significant differences ($P > 0,10$ for all comparisons).

The number of symptom-free visits per patient was then compared for years 2 and 4, and showed a statistically significant difference, 4,16 in year 2 versus 5,1 in year 3 (Table III) for the experimental group; no significant change was noted in the control group.

Table III. A comparison of the average number of visits per patient at which patients were symptom-free (morbidity scores = 1 for years 2 and 4)

	Year		
	2	4	Significance (P)
Experimental group ($N = 22$)	4,164 ± 2,969	5,136 ± 2,66	$P < 0,05$
Control group ($N = 10$)	3,60 ± 1,897	3,90 ± 2,378	$P > 0,05$

The number of visits with different morbidity scores in years 2 and 4 were compared (Table IV), with the more severe scores of 3, 4 and 5 combined. The percentage of total visits with these severe scores was significantly reduced ($P < 0,05$) and the less severe (2) scores increased in year 4 compared with year 2 ($P < 0,05$) in the experimental, but not the control group.

Table IV. Different morbidity scores as a percentage of total visits

	Control group		Experimental group	
Morbidity score	Year 2	Year 4	Year 2	Year 4
5, 4 and 3	21,2	16,7	32,6	8,6
2	22,0	21,0	24,6	34,3
1	56,8	62,2	42,9	57,1

Discussion

Patients from a poor socio-economic environment who visited two separate asthma clinics at the same hospital were compared. The patients were adults with moderate to severe chronic asthma.[4,5] Both groups were treated similarly and received the same drugs. The initial pre-intervention asthma morbidity scores were also similar in both the experimental and control groups. Because of high morbidity, additional measures were then introduced at one of the two clinics (see methods). The average morbidity score was significantly reduced with the introduction of the additional measures.

The higher morbidity scores are much less frequent than the less severe scores, with consequent low average scores. Because of this appearance a comparison was made between scores for the year before changes were introduced (2nd year) and the year of optimal benefit (4th year). A significant reduction in the percentage of total visits with a severity score of 5, 4 or 3 taken together was also found, with a proportionate increase in score values of 2 and 1 in the experimental group; the increase in 2 values was

significant. No such changes were seen in the control group. This indicated that the additional measure did improve overall morbidity.

Comparison of the average number of visits at which patients were symptom-free also shows a significant increase in the experimental group only (Table III).

We conclude that the additional measures introduced made a significant and clinically meaningful difference to overall patient well-being through an important decrease in morbidity. Patients were taught optimal use of the MDI where co-ordination skills were adequate. Where not, the MDI was replaced by powder inhalation (rotacaps). Before the introduction of the new measures both groups were routinely on oxtriphylline three times daily which, if taken regularly, should result in blood levels comparable to those obtained with the sustained-release theophylline preparation given later to the experimental group. As the blood levels were consistently monitored after the introduction of the new measures and compliance actively encouraged, the average blood levels may in fact have been better in the experimental group. This may partially explain the improved response. It is however not possible to determine with any measure of certainty which of the changes resulted in what part of the improvement found. The authors believe all changes collectively contributed to the improvement.

In addition compliance was improved by use of theophylline blood levels to indicate non-compliance on the part of patients. We found blood theophylline levels more suitable for this purpose than, for example, the weighing of aerosol canisters.

By also repeatedly explaining the nature of the disease and why drugs need to be used prophylactically, the health team created an impression of caring, further improving trust and compliance. This is all the more important in a group of patients with a poor socio-economic background.

By observing patients carefully, we noticed how quickly patients tend to forget what they had been told and also how quickly they fell back into bad habits, using their MDIs wrongly if not constantly reminded and shown how to do it correctly.

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Retrospective analysis of snakebite at a rural hospital in Zululand

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Aspects of the epidemiology and clinical features of 81 consecutive patients admitted with snakebite to a rural hospital in Zululand are reviewed.

Most bites occurred during the hot season, 40% in children under 10 years of age. Thirty per cent of bites occurred at night. Most bites showed features of local envenoming only, but systemic features (neurotoxicity and haemorrhage) were encountered. Snakebite caused significant morbidity and mortality. Thirty-one per cent of admissions needed surgery; almost 50% needed more than one operation. Five per cent, all children, died. The extent of local envenoming on admission proved to be a highly sensitive indicator of risk of worsening of local envenoming, and of the development of systemic signs.

The analysis has allowed the development of rational guidelines on the management of snakebite in this hospital which, it is hoped, will reduce mortality rates, and has identified several areas warranting further research.

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Venomous snakebite causes significant morbidity and mortality in many parts of the world. Clear guidelines on the management of snakebite are available,[1-3] but much variation and uncertainty may still occur in clinical practice.[4]

There are about 130 species of snake in southern Africa;[5] most are not poisonous and even fewer are potentially life-threatening. A wide variety of venomous snakes is found in Zululand,[6] and the population is very fearful of them. Snakebite is not notifiable in South Africa and although it has been stated that the annual mortality rate in this country is negligible,[7] this may not be so, as the incidence of snakebite is usually underestimated owing to lack of reliable epidemiological data.[2]

There is no recent published analysis of snakebite in Zululand. This retrospective analysis was carried out to clarify aspects of the epidemiology and clinical features of snakebite in this region, and to develop guidelines for the hospital management thereof. This is particularly important in so far as many rural hospitals are staffed by foreign doctors who stay for short periods and may not be familiar with the management of snakebite.

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