

ASTHMA IN CHILDHOOD*

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The cure of asthma is still beyond the reach of most medical practitioners and to many it is a frustrating fickle disease which demands much time and gives little reward. The flush of success in a particular case is often followed by the pallor from a night's vigil at an asthmatic's bedside, and therapy resolves itself into administering symptomatic relief. Various cough mixtures, tablets, vaccines and courses of injections are tried and in time the patient drifts on to another practitioner, also without success. The hospital out-patient department follows and fails, and the patient continues the rounds of doctor, chiropractor, herbalist and dietitian.

It was at the out-patient department of the Children's Hospital, Addington, that I realized the extent of the problem of asthma, which we think is particularly prevalent in Durban, where humidity, heat, intestinal parasites and pollens from tropical foliage have all been incriminated, but without proof. Many cases presented themselves at the hospital, and the therapy was largely symptomatic. Because of lack of time a rapid history would be recorded, a few investigations instituted, some tablets and a cough mixture prescribed, and a few

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pious words of advice offered. As like as not when the patient returned, a different, but also busy, doctor would see the case; he would announce the negative results of the tests and repeat the previous prescription. It was decided 2½ years ago to establish an asthma clinic where patients would be seen at leisure and by appointment and careful attention given to the patient, his disease and his environment. The results and conclusions drawn are now to be reviewed but let me say at once that there is really nothing new to offer and certainly no wonderful cure. It is felt, however, that real facts are worth repeating, especially if they have become lost in a multitude of theories and therapies. The approach has been purely clinical and can be carried out by any general practitioner who takes an interest in the patient and secures the confidence and co-operation of the parents. No elaborate techniques have been necessary and the psychiatric department has not been burdened. Statistical evidence will not be led.

Methods and Material. Most of the patients were referred from the medical out-patient department and only a few direct from general practitioners. Of the 60 original cases seen, 38 have been followed up for a year or more. Of the 22 cases remaining, 5 came only once and 17 others only 2 or 3 times, either because of

the lack of immediate results or dissatisfaction with the treatment. Six others of the 60 are known to have moved away from Durban. I have personally seen and followed up all the cases. At the first interview a very full and comprehensive history was taken, a complete examination made and routine tests instituted, as follows: X-ray of lungs (also of sinuses in patients over 4-5 years of age), complete blood count and Wasserman test, 3 stool examinations, a nasal smear for eosinophils, and a tuberculin patch-test. Skin tests for inhalants and suspicious foods were performed as a routine in the early days of the clinic, but this procedure was soon abandoned. A clinical assessment of the condition was made and treatment given accordingly. This always included breathing exercises (which are taught in a class at the physiotherapy department), advice to the mother on her attitude to the patient and the disease, and some anti-asthmatic drugs such as ephedrine, aminophylline, benadryl and benecardin, alone or in combination. Patients were seen as often as was possible and deemed necessary, usually every 2 or 3 months.

ANALYSIS OF 55 CASES

In 8 cases there was a history of domestic strife and it is noteworthy that none of these cases improved very much.

There was a strong history of asthma in the family in 20 cases while 13 others gave a positive family history of some allergy.

The white-cell counts were seldom raised, without a definite cause being found, but there were a few exceptions. An absolute eosinophilia was usual but it was not high (see Fig. 1). In one case the very high eosinophilia of 80% was proved to be due to the Katayama syndrome or invasive phase of bilharzia. Apart from this case, and a few others in which the eosinophils ranged between 25% and 33%, the majority

TABLE I. SHOWING AGE AND SEX INCIDENCE AND DURATION OF DISEASE

Age	Female	Male	Average Duration of Disease
0-3 years	4	7	17 months
4-6 years	9	14	27 months
7-9 years	1	13	4½ years
10-12 years	2	5	5 years
Total	16	39	

had a mild eosinophilia only. The graph shows that the presence of ascaris lumbricoides ova in the stools had no obvious influence on the eosinophil percentage. Table I shows the usual sex incidence.

Allergic rhinitis is commonly associated with asthma and is often the trigger that sets off an attack. Of 41 cases in which nasal smears were examined an excess of eosinophils was found in 22.

At least 3 stool examinations were done in each of 51 cases and of these 12 showed *Ascaris lumbricoides* ova, 3 *Giardia lamblia*, 1 *Schistosoma mansoni*, and 1 cysts of *Entamoeba histolytica*. Their presence did not aggravate the asthma nor did the asthma improve after treatment of the infestation. They seemed to have little bearing on the disease.

Treatment. An integral part of treatment is the taking

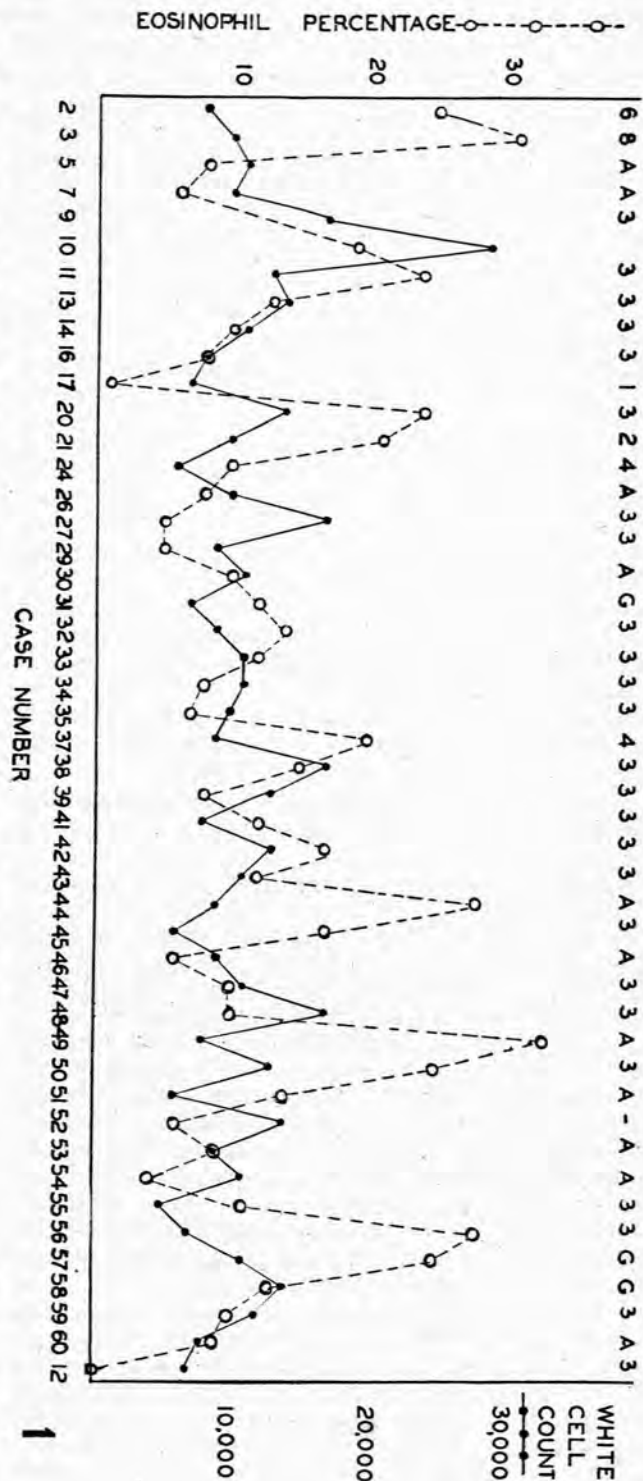


Fig. 1. A=Ascaris lumbricoides, G=Giardia lamblia.

of a very full history and enquiring into the domestic situation and possible precipitating factors, such as climate, exertion, presence of animals and house-dust. The personality of the child and his place in the home and

relationship with siblings and parents is also measured. Often it is found that the child 'uses' his asthma and everyone gives in for fear of precipitating an attack. The mother becomes over-protective and puts him to bed at the slightest excuse, whether it be a running nose or just a cold day, and many days and weeks of school are missed. The dry irritating cough which is so typical and resounds through the house at night, becomes magnified and cough mixtures are used to no avail. Regularly the nights are disturbed and the sleeplessness and anxiety produce an irritable cross household.

At the clinic the parents are told that with their help and co-operation the number and severity of the attacks will be lessened but they are not offered a cure. I then add the hope that in time the child will 'grow out' of his trouble but that until then we must do all we can to ease and lighten the burden. They are usually very satisfied with this encouragement and once they have begun to come regularly, once they have attended the clinic 4 or 5 times, they are pleased to continue attendance. They have all been appalled at the recent suggestion that the clinic should be discontinued.

If allergic rhinitis is marked and acting as the trigger the child's bedroom is cleared as completely as possible of all dust-collecting articles. Curtains, carpets, furniture and toys are removed. The ideal is to have a bare room with just a bed in it so that the child sleeps in as dust-free an atmosphere as possible. An antihistaminic orally and as a nasal spray is usually prescribed too.

Breathing exercises are stressed and both children and parents are taught them so that they are performed regularly at home.

Specific therapy usually consists of $\frac{1}{4}$ gr. of ephedrine hydrochloride in elixir benadryl to 2 drachms to be given t.d.s. together with $1\frac{1}{2}$ gr. of aminophylline at the same time. This is used for 2 weeks and then twice a day for 2 weeks and then at supper-time only; it is continued for months on end. Variations of this regime are used—aminophylline only or the ephedrine mixture alone—but it is stipulated that if an attack is thought to be imminent the full regime is brought into use immediately to try to abort it and is stopped after a few days if the patient keeps well. By this routine we have been able to abort many potential attacks. There are many other antispasmodics or combinations which can be used just as successfully, and no particular claim is made for those mentioned; it is their usefulness in prophylaxis that is stressed. Aminophylline is a great help. There are a few who cannot take it at all because it makes them vomit but, on the whole, children take it very well and in large doses. I seldom use less than $\frac{3}{4}$ gr. t.d.s. and $1\frac{1}{2}$ gr. b.d. or t.d.s. is the usual dosage. This can be continued for months without ill effects, but after a time it is not usually necessary to give it 3 times a day; just at night is sufficient. We have seen some remarkable improvements in general well-being following this therapy. The parents are delighted with the improvement in behaviour, and especially in appetite, which is borne out by a substantial gain in weight. Many have gained as much as 4-5 lb. in 2 months.

Some patients who had already used an inhaler with some relief found that it could be discarded, while others

still continued its use, which was not discouraged while it was of benefit.

Benecardin, 25 mg. b.d. or t.d.s., has been tried in a few cases with apparent success to begin with, but it soon loses its good effect. We use it now only if other antispasmodics have failed.

Hydrocortisone as a prophylactic in small doses daily has been used in one case only; whether this therapy is really justified is questionable, but it was a desperate method in a patient who was suffering repeated attacks each night, confining him to bed by day, making him disagreeable, irritable and crotchety. Now, after 2 months therapy, he is taking $2\frac{1}{2}$ mg. twice a day, is very happy and a pleasure to live with, eats well and has gained weight; but still wheezes slightly at times. This the mother says is no disability.

When infection was present chemotherapy was instituted and in a few cases prophylactic sulphadiazine was used, but with equivocal results.

CASE REPORTS

Case 13. C.L., female aged 4 years, was first seen in April 1952 because asthma had started 1 year previously. There was no family history of allergies but possible precipitating factors were thought to be sudden cold weather, the change of the seasons and fear of a father who drank excessively. She was treated by the family practitioner with various medicines and improved for a period but then relapsed. Attacks occurred nightly, usually waking her with cough and wheezing followed by dyspnoea. On examination only allergic rhinitis was found to be present. Routine investigations were not helpful although skin tests showed strong reactions to feathers and house dust and a milder reaction to mixed compositae. She was given a mixture of $\frac{1}{4}$ gr. of ephedrine hydrochloride in elixir benadryl to 1 teaspoonful, together with $1\frac{1}{2}$ gr. of aminophylline, t.d.s., and an antisthine-privine nebulizer for spraying the nose. Breathing exercises were commenced and the child began to sleep on a porch which was made as free of dust as possible; the feather pillows were changed to kapok.

She improved slowly but still developed attacks, particularly on Saturdays and Sundays when father was at home. They were not as severe as previously and were controllable by the medicines. After 3 months the mixture was only used when necessary, but aminophylline was continued twice a day and later was used at night only. By the end of 1952 she was much improved and continued so in 1953, when only one severe attack occurred, necessitating an adrenalin injection. Mild attacks of irritating cough and wheezing occurred, which were easily controlled. It was at this time that the family moved to another house and the father's drinking spells were stopped because he was blacklisted. Improvement continued and for 6 months now prophylactic medicine has been used intermittently only and not regularly. The mother states that 'she is well and happy and a different child'.

Case 9. J.M., a male aged $7\frac{1}{2}$ years, was examined first in April 1952. His asthma had begun 9 months previously, after an attack of bronchopneumonia. It always started with a cold, occurred every month and lasted 2 to 4 days. His mother was an asthmatic too and used an inhaler frequently; his sister had hay fever.

The domestic situation was unsatisfactory, as the mother was highly neurotic and under the care of a psychiatrist, while the father was old and in financial difficulty. The boy himself was mentally slow, somewhat stupid and in class I at a special school. Examination revealed a pallid, thin, flat-chested boy with a blocked nose. Wheezes were heard in the lungs.

Investigations were negative except that skin tests showed a +++ reaction to mixed grass pollens. He was given ephedrine and aminophylline prophylactically but was only slightly improved. He used an inhaler every night, had many severe attacks, some necessitating adrenalin injections, and once spent 2 weeks in hospital. Like all chronic cases he would improve and relapse at intervals. He would be worse during school holidays, on exertion, and in damp weather; and when his mother was about. She was obviously bad for the child, had no insight, and was overprotective. In

January of this year he entered the hostel of the special school and has not had an attack there; this despite all medicines being discontinued. He is happy and gained 6 lb. in 8 weeks. During this time he was allowed home for one week-end when, the mother states, he was cheery and asked for the atomiser which he used and soon fell asleep. Examination during this wonderfully good spell showed that his nose was still blocked and rhonchi were still heard on inspiration. His mother says that he is more obedient and is a nicer child.

Case 5. B.D., a male aged 3 years, began his asthma at the age of 2 years. Attacks occurred monthly but were weekly when first examined in March 1952; they lasted 2-3 days. There was no family history of asthma and no psychogenic disturbance. Apart from malaria he had had no serious illness, but an X-ray of the lungs 3 months after his first attack showed a right basal bronchopneumonia. This was still present 9 months later but it could not be detected on clinical examination, which was completely negative. Skin tests suggested a sensitivity to cheese and a test meal produced an attack. Cheese was eliminated from the diet, but without relief, and later when reintroduced it made no difference. Because of the persistent X-ray appearance in the lung bronchoscopy and bronchogram were performed, with negative results. The attacks persisted. A long stay in hospital for a surgical correction of a congenital deformity did not improve matters, although the episodes were not so severe. The condition persisted and in July, 15 months after the first examination, he suffered a particularly severe attack which did not respond to intravenous aminophylline.

He was taken away to the Drakensberg mountains, 4,000 feet above sea level and for 3 months was perfectly well, did not cough or wheeze, or need any medicine whatsoever. He gained 6 lb. in weight. Within 48 hours of returning to Durban both the cough and wheezes began again.

Case 59. T.H., a male aged 4, was first examined in September 1953 because of asthma of 2 years duration. The first attack began when the patient was sent away to stay with strangers because the mother entered a nursing home to be delivered of her third child. On returning home he was aggressive toward the new baby and the mother found him difficult. He had always been a thumbsucker and a 'hysterical type' and was regarded as the 'cuckoo in the nest'. At first his attacks occurred every 6 weeks but later weekly and even nightly, and despite all kinds of antispasmodics adrenalin injections were also necessary. Investigations were all negative; eosinophils were absent from the blood count and nasal smear.

Despite adrenalin, aminophylline, ephedrine, antihistaminics, benecardin, an inhaler, antibiotics and sedatives he continued to wheeze and cough and have asthma every night and sometimes in the day too. Hydrocortisone was started, 5 mg. 6-hourly slowly decreased over a period of 6 weeks to 2½ mg. b.d. During this time he changed completely and became a delight to live with, happy and smiling with a mild 'moon face'. No asthma has occurred, although he still wheezes at times, but this is no disability for he sleeps right through most nights. No complications of steroid therapy have occurred except for a full face, and he overcame an attack of influenza in a few days.

DISCUSSION

It has always been my custom when dealing with a case of asthma for the first time, to initiate the normal battery of tests immediately and include a series of skin tests—both scratch and intradermal—of the common allergens and any other particularly suspect. I have not found these to be very helpful and the few who were desensitized to house dust, mixed grasses or mixed compositae were failures. The paediatric text-books devote the greatest part of the portion on treatment to the various techniques for skin testing and desensitization, followed by detailed elimination diets; the psychogenic aspect of asthma is usually dismissed in half a page. We shared this point of view until it became obvious at the clinic that skin testing and dieting did not produce results, the psychological factors seeming to play the major part. Of course the constitutional factor is admitted, often in association

with a strong family history of allergy, but psychogenic causes act as the triggers more frequently than allergens. In those cases where domestic stress was marked the results were poor but where these causes were absent and parents were interested and co-operative the results were good. It is not suggested that skin testing and dieting should be eliminated altogether but where they fail or if they are impracticable the basis for therapy is to obtain the goodwill and co-operation of the patients, to show a kindly interest in their problems, to offer advice, eliminate fears and obtain the confidence of the patient. To achieve this takes time and it is difficult for the general practitioner. So often parents are told that the child will grow out of it and they need not worry. They are not satisfied with this and find it most difficult not to worry while they watch their child struggling to empty his lungs; it is a frightening disease, especially in the dark dreary hours before dawn when attacks are all too common. If it happens nightly or weekly or even monthly they want some relief and regular reassurance.

Usually during an attack, and after much debate, worry, anxiety, fears and doubts, the practitioner is called out to give an injection which eases the attack and within a day or two the episode is over. Little is done by the doctor to come to grips with the disease. He 'pops' in to see the patient on a visit or two and then does not see him again until next an injection is needed. The child then will often associate the doctor with the needle and will fight and scream when he approaches; this excessive lung straining will certainly aggravate an attack; so may much laughing, coughing or strenuous exercise. It is contended that if, at this stage, an interest is shown and the patient's case history reviewed each month, severe attacks will be diminished. During these interviews all possible psychogenic factors can be examined and suggestions made as to clothing, diet and exercise. Breathing exercises can be re-stressed and normal behaviour on the part of mother and child examined. If there is no infection he must be allowed to go to school and must be kept out of bed unless really ill. The relationship between siblings, teachers, friends at school, and especially parents, must be examined regularly, since deviations so often start an attack. If the family doctor is not prepared to follow this regime he should hand the case over to one who is.

Allergic rhinitis was a persistent and recurring factor in 66% of the cases, usually preceding an attack and apparently acting as the precipitating mechanism. Often it is due to some inhalant allergen and often it is due to infection. Upper respiratory infections are well known to precipitate the sneezing or to occur as a secondary invader. Some authors such as Schick and Peshkin (1953) stress inhalant or food allergens as the principal trigger factor while others, particularly Chobot (1951), stress bacteria, but few emphasize the important psychogenic causes. These are common too and have been stressed recently by O'Niell and Malcolmson (1954), and Bakwin and Bakwin (1953). Even Lewis Carroll was familiar with this (although his advice is probably not

acceptable to the psychologists) when he wrote in *Alice in Wonderland*:

'Speak roughly to your little boy,
And beat him if he sneezes;
He only does it to annoy
Because he knows it teases.'

SUMMARY

The reasons are given for beginning an asthma clinic at the Children's Hospital, Addington, and the results over 2½ years reviewed.

Those patients who attended regularly have been improved, some quite remarkably; this is thought to be due to the interest taken in the patient and his environment and the advice and reassurance given to the parents. It is suggested that the family doctor could do this.

This study confirms that psychological factors play a major part in asthma in children.

Although an X-ray of the lungs is essential, routine investigations have not been very helpful.

The use of ephedrine hydrochloride, aminophylline and various antihistaminics is recommended, particularly as prophylactic treatment over a long period to prevent or abort attacks. Some illustrative case reports are presented.

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REFERENCES

- Bakwin, H. and Bakwin, R. M. (1953): *The Clinical Management of Behaviour Disorders in Children*, pp. 405-407. Philadelphia: W. B. Saunders Co.
- Chobot, R. (1951): *Pediatric Allergy*, p. 40. New York: McGraw-Hill Book Coy., Inc.
- O'Niell, D. and Malcolmson, K. (1954): *Brit. Med. J.*, **1**, 554.
- Schick, B. and Peshkin, M. M. (1953): In *Brennemann's Practice of Pediatrics*, Vol. II, Ch. 57, p. 26. Hagerstown, Maryland: W. F. Prior Co.