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Asthma In Children

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ASTHMA IN CHILDREN

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The material comprising this paper represents the follow-up on 100 patients under 12 years of age who were first seen during the years 1934 to 1940, and who were treated mainly by allergic cleanliness, and hyposensitization measures. These patients were followed for from 3 years to 10 years. In the series there were 60 males and 40 females. The average age of onset of the asthmatic symptoms was 4.4 years of age. There was a family history of asthma in 68 children and the same number had some associated form of allergy such as eczema, urticaria, or hayfever.

An additional twenty children are also included who had been poorly controlled on the standard anti-asthma programs. These patients were treated in the clinic in 1953 and 1954 with "Tyral," a preparation containing 200 mg. of the amino acid tyrosine, 2.5 mg. of pyridoxine HCL, and 10 mg. of niacinamide. The purpose of this compound is to supply the body with ample precursors of adrenalin. Tyrosine is the amino acid from which adrenalin is made; pyridoxine acts as a co-enzyme in its build-up; and niacinamide is employed for its anti-histaminic action. The dosage was three "Tyral" tablets four times a day.

PATHOLOGY

In the allergic state there seems to be one organ that is susceptible to the insult of a histamine response to an antigen. Be it the skin as seen in eczema and urticaria, or the respiratory system, as in asthma where we see edema of the bronchial mucosa, spasm of the smooth muscle of the bronchial tree and mucous plugs in the bronchioles, the pathologic processes are similar.

The reasons for the particular responses seen in the allergic state are still obscure. Perhaps such experiences as infections or emotional trauma lower the susceptibility of the response organ and the clinical picture is produced. Another interesting concept has been brought out by Widmann and Keye[1] who theorize that the allergic individual has a low circulating adrenalin which makes possible the appearance of the signs of allergy. Much work is needed in an effort to help us understand the exact mechanism behind the allergic response.

CAUSE

The etiologic allergens in childhood asthma are for the most part inhalants, although food sensitivities do play some role.[2,3,4,6] Endocrine imbalance has long been recognized as a factor in allergy, and this was borne out by the children in our series who exhibited hypothyroidism as manifested by delayed bone age and/or low basal metabolic rates. Emotional causes are hard to evaluate, but one could not help seeing in some cases clear-cut evidence, despite specific sensitivities, of perhaps "psychic sensitivities" which played major parts in the child's asthma pattern.

In the determination of the specific causative allergens, history was most important, and skin tests were often used to support the material gained from the history. The skin testing material was prepared after the method of Coca,[6] and the usual skin test dose was 0.1 cc. of a 1:100,000 or 1:10,000 mixture given intradermally. Chart number 1 shows

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the number of reactions seen in the group of 100. For a reaction to be considered significant 2+ reading had to be obtained. Not only was the skin test reaction helpful in the determination of the causative allergens, but it was also useful as a guide to the initial hyposensitizing dose. An example is the child who responds 4+ to a 1:100,000 ragweed injection and has mild asthmatic symptoms caused by this test dose. He needs a very small starting dose, such as .05 cc. of a 1:1,000,000 dilution, so as to avoid systemic reactions.

CHART No. I

Allergen	*Reactions*
Bacteria	83
Grasses	53
Ragweed	53
Foods	31
Dusts	26
Danders	16

Bacterial sensitivity can be seen to be the principal cause of asthma in childhood and by history, 44 of the patients had an attack provoked by an upper respiratory, tonsil, or sinus infection. The reverse was also often true, that control of the infection brought an end to the asthma.

TREATMENT

The therapy of the chronic asthmatic should be divided into immediate and long range management[7,8,9,10].

IMMEDIATE: For the control of an acute asthmatic episode there are of course the standard and time-proven preparations employing adrenalin or a related compound, aminophyllin, an iodide, and a sedative. A particularly useful solution in refractive cases was found to be one composed of 100 to 200 cubic centimeters of 5 per cent glucose in water, 250 to 500 milligrams of aminophyllin, and 20 to 40 cubic centimeters of a 10 per cent sodium chloride solution. This mixture was given intravenously over a 30-90 minute period and produced excellent results in almost every instance.

LONG RANGE: The long range program should include several steps:

1. *Allergic cleanliness*—These measures include removing a serious focus of infection, such as an infected maxillary antrum. Good anti-dust or dander campaigns in the home are needed. Elimination of specific foods, when found to be harmful, is in order. A word of caution, however, should be introduced regarding the elimination of essentials. Too often an individual goes into a state of nutritional bankruptcy on a rigid elimination program, thereby making a favorable response to any stress situation, including allergy, nearly impossible.
2. *Correction of Endocrine Inbalance*—If the hypothyroid state exists correction of course is mandatory. In our eight hypothyroid children the addition of thyroid extract to the anti-asthma regime brought gratifying results rather promptly in six of them.
3. *Vaccines*—The hyposensitization with the extracts that gave positive skin reactions has long been used. We employed this method in eighty-eight of our children and obtained good results in fifty-one of them, or 61 percent. Good results meant at least a 50 percent improvement in the signs and symptoms.
4. *Psychological Care*—The "psychic sensitivities" of course should be investigated

wherever possible, but often this therapeutic approach is disappointing. Correction along these lines includes not only counselling of the patient but also of the parents.

5. *Tyral*—As mentioned previously, a small number of childhood asthmatics were placed on this medication alone. With this compound we hoped to provide the children with a maximum of the necessary materials used in the synthesis of adrenalin by the body. The work of Widman and Keye[1], plus that of Woodward[11], and also Spickard[12] gave good results in 75 percent of asthmatics in the pediatric age group. Some of our results have been in accord with theirs, being classified by parents as "miracles." On the other hand the exact opposites were encountered, meaning dismal failure using Tyral and/or purified tyrosine[13].

   While the final results present a somewhat hazy picture, this new drug may in the end, provide us with one more effective agent to treat the chronic asthmatic.

DISCUSSION

At first glance, the prospect in the long run for childhood asthmatics may appear to be poor, but this certainly is not true. We can see that with vigorous treatment including hyposensitization measures, six out of ten chronic asthmatics can be controlled. This figure is certainly in keeping with that of Rachemann and Edwards[8], who reported a twenty-year follow-up on 449 childhood asthmatics. They gave the encouraging figure of 71 per cent being asthma-free after twenty years, provided adequate therapy was given. The key, therefore, to good asthma management is to find the causative factors, if possible, and then proceed to treat these children in an energetic fashion.

SUMMARY

1. 100 cases of asthma in children are reviewed.
2. The exact mechanism behind the allergic response is still obscure.
3. Inhalants, including bacteria, grasses, ragweed, were the most frequent allergens noted, with foods, dusts, and danders next in importance.
4. Emotional causes are prominent in some cases.
5. Immediate treatment is usually not controversial.
6. Long term treatment can be successful, but each case must be individualized as to the methods to be employed.
7. In our hands, therapy including hyposensitization procedures gave 61 per cent favorable long term results.

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