

Faculty of Medicine, Cairo-University, Egypt

CANDIDA ALBICANS AS AN IMPORTANT RESPIRATORY ALLERGEN IN THE UNITED ARAB REPUBLIC

By

ANISSA M. EL-HEFNY

During the routine investigation of allergic cases, it was noted that *Candida albicans* sensitivity detected by skin tests was frequent. Many patients who had a previous desensitizing course with no success showed markedly positive skin responses to *Candida albicans*. Also it was noted that some cases with a chronic unproductive irritating cough revealed *Candida albicans* sensitivity. For these reasons it was decided to estimate the incidence of *Candida albicans* sensitivity among patients with respiratory allergic diseases in the different age groups, as well as its relation to the duration and severity of the condition.

MATERIAL AND METHOD

Cases presenting with a respiratory allergic disease were thoroughly investigated. These respiratory diseases were perennial nasal allergy or allergic rhinitis which was diagnosed in cases with paroxysmal recurrent rhinorrhoea, sneezing, nasal obstruction and itchiness with pale bluish grey and oedematous mucous membranes (5, 2). Pollen allergy cases were excluded. Bronchial asthma was a diagnosis given to cases with paroxysmal attacks of dyspnoea and coughing, commonly occurring at night (9). Cases with paroxysmal attacks of coughing who benefited from antihistaminics were included in the study. Most of these patients were referred to me by chest specialists, otorrhinologists, paediatricians and internists for allergic investigation and management and were therefore already a selected group of possibly allergic patients.

Each case had a thorough history as well as a personal and family history of allergic diseases. Only those cases who could be definitely diagnosed as allergic were included. They were examined clinically and the grade of the

allergic disease estimated, whether mild, moderate or severe (7). An X-ray of the chest was done and cases with evident radiological changes were excluded from the study. The cases were skin tested for *Candida albicans* by a modified prick technique, and if negative, intra-cutaneous testing was done. The *Candida albicans* extracts used were obtained from Bencard Research Laboratories. A 5 per cent solution extract was used for the modified prick test and a 1 per cent solution for the intra-cutaneous test. Results were read after 20 to 30 minutes and were interpreted as follows:

- + Wheal less than 0.5 cm in diameter but larger than that caused by the introduction of antigen, *i.e.* mild reaction.
 - ++ Wheal 0.5 cm in diameter with pseudopods and areola, *i.e.* moderate reaction.
 - +++ Wheal 0.75 cm in diameter with pseudopods and areola.
 - ++++ Wheal 1.0 cm in diameter with pseudopods and areola.
- Both +++ and ++++ were considered as severe reactions.

RESULTS

The study included 353 patients from 6 months to 60 years. They were 215 males and 138 females. *Candida albicans* sensitivity was present in 172 cases (47.87 per cent), of which 99 (46.09 per cent) were male and 73 (52.89 per cent) female. The positive reaction to *Candida albicans* was mild in 39.8 per cent, moderate in 36.6 per cent and severe in 23.6 per cent of the cases (Table 1).

TABLE 1
The Number and Percentage of Mild, Moderate and Severe Skin Reactions to Candida Albicans.

Sensitivity of the reaction to candida	No. of cases	Percentage
Mild +	68	39.8
Moderate ++	63	36.6
Severe +++ ++++	41	23.6

As regards the age, *Candida albicans* sensitivity was positive in 34.7 per cent of children below the age of 3 years,

29.6 per cent in those between 4 and 10 years, from 11 to 20 years in 60.7 per cent and from 21 to 30 in 54.4 per cent. Cases from 31 to 40 years and 41 to 50 years showed positive *Candida albicans* sensitivity in 62 per cent and 57.1 per cent respectively, while only 36.3 per cent of cases above 50 years gave a positive reaction (Table 2).

TABLE 2

The Number and Percentage of Positive Skin Tests to Candida Albicans in the Different Age Groups.

Age group in years	No. of cases	No. of cases with positive sensitivity to candida	Percentage of positive cases
0-3	23	8	34.7
4-10	91	27	29.6
11-20	56	34	60.7
21-30	79	43	54.4
31-40	58	36	62.0
41-50	37	20	57.1
50+	11	4	36.3

As regards the allergic condition, 186 cases had mainly allergic rhinitis with 58.06 per cent with positive *Candida albicans* sensitivity. As their major complaint, 103 had a recurrent paroxysmal cough, and 63.1 per cent of them gave a positive sensitivity test to candida. Patients with asthma as the main complaint were sensitive to candida in 47.63 per cent of the cases (Table 3).

TABLE 3

The Number and Percentage of Positive Skin Tests to Candida Albicans in Relation to Diagnosis.

Diagnosis	No. of cases	No. of cases with positive skin test to candida	Percentage of positive skin test
Allergic rhinitis	186	107	58.06
Allergic cough	103	64	63.1
Asthma	233	111	47.63

Taking into consideration the severity of the allergic condition, 134 cases were diagnosed as having mild allergic symptoms with 18.65 per cent positive skin tests to *Candida*. Moderate allergic symptoms were diagnosed in 146 with 60.93 per cent positivity while 79.45 per cent of the cases with severe symptoms revealed *Candida albicans* sensitivity (Table 4).

TABLE 4
The Number and Percentage of Positive Skin Tests to Candida in Relation to the Grade of Allergic Complaint.

Grade of allergic complaint	No. of cases	No. of cases with positive skin test to <i>Candida</i>	Percentage
Mild	134	25	18.65
Moderate	146	89	60.93
Severe	73	58	79.45

TABLE 5
The Incidence of Positive Skin Sensitivity to Candida Albicans in Relation to Duration of the Disease.

Duration of disease in years	No. of cases	No. of cases with positive sensitivity	Percentage
1	59	27	45.7
2-5	161	75	40.37
6-10	71	32	45.07
11-15	27	16	59.26
16-20	16	8	50.0
<20	19	14	73.68

It is worth mentioning that the severest reactions to *Candida albicans* were prevalent in cases with paroxysmal allergic cough as they were present in 19.81 per cent of the cases, while asthmatics and cases with allergic rhinitis had severest reactions in 7.08 per cent and 2.73 per cent respectively.

As regards the duration of the complaint, the incidence of

positive sensitivity to *Candida albicans* was more marked in prolonged cases (Table 5).

DISCUSSION

Candida albicans, a yeast like fungus, is known to replace micro-organisms killed by wide spectrum antibiotics and penicillin when they become very resistant to treatment. It has already been described as an allergen (8) and a not infrequent cause of asthma and therefore is of more significance than a casual inhabitant of the respiratory tract (10). To detect its allergenicity, skin testing (3) as well as provocation tests may be used. For nearly half a century skin testing has been used in allergic diagnosis and specific allergic therapy (4).

The incidence of *Candida albicans* sensitivity in this study is in agreement with other investigators. Nakamura found by skin testing that children in Japan with bronchial asthma gave 29.8 per cent positive results with *Candida albicans* (6). Buffe *et al.* (1) using intra-cutaneous tests with 1/10,000 to 1/100,000 candida extract, showed positive reactions were obtained in 62 to 93 per cent of allergic subjects. On the other hand, Tees & Milner (5) found no patients under the age of three years sensitive to candida, while in this study the group of children revealed 34.7 per cent sensitivity. This marked difference may be explained by the fact that in our country paediatricians like using wide spectrum antibiotics as well as penicillin in diseases of children in general and in respiratory infections and asthma in particular.

The fact that *Candida albicans* sensitivity was more marked in chronic cases as well as the severest cases could be explained on this assumption, *i.e.* they received more antibiotics than patients with a short history of mild complaints.

The important finding in this study was the presence of marked *Candida albicans* sensitivity in cases with paroxysmal cough (63.1 per cent), and the fact that the severest reactions were also present in these cases. This needs further study.

SUMMARY

An effort was made to estimate the incidence of *Candida albicans* sensitivity among patients with respiratory allergic diseases in different age groups, as well as its relation to the duration and severity of the condition. The study included 353 patients from 6 months to 60 years. Skin testing showed *Candida albicans* sensitivity was present in 47.87 per cent. The incidence was high in children below the age of 3 years (34.7 per cent). In cases with allergic rhinitis it was 58.06 per cent recurrent paroxysmal cough 63.1 per cent and bronchial asthma 47.63 per cent. The severest skin test reaction to candida was in those with paroxysmal cough, as well as in prolonged cases. The relation between *Candida albicans* sensitivity and the abuse of antibiotics is discussed.

REFERENCES

1. Buffe, D., Gross, E., Dominjoin Monmer, F., Burtin, P. & Kowrilsky, R.: Étude comparative des seuils de reactions cutanées à la poussière de maison et à candida albicans chez les Allergiques et les non Allergiques. Rev. Franc. Allerg., 1, 48, 1961.
2. Dean, L. W.: The fundamentals of allergic rhinitis with particular reference to ionization (iontophoresis). Am. Otol. Rhin. & Laryngol., 45, 326, 1936.
3. Fineman, A. H.: Studies in hypersensitiveness. J. Imm., 11, 465, 1926.
4. Fontana, V. J., Wittig, H. & Holt, L. E.: Observations on the specificity of the skin test. J. Allergy, 34, 4, 348, 1963.
5. Hansel, F. K.: Allergy of the nose and paranasal sinuses. St. Louis Mosby Co., 1936.
6. Nakamura, K.: The frequency of etiologic factors in bronchial asthma in Japan. Allergologica V Congresso International, p. 335, 1964.
7. Pearson, R. S. B.: Natural history of asthma, Acta allergol., 12, 277, 1958.
8. Tees, E. O. & Milner, F. H.: The allergen of asthma, Acta allergol., 17, 536, 1962.
9. Williams, D. A. & Leopold, J. G.: Death from bronchial asthma. Acta allergol., 14, 83, 1959.
10. Winkenwerder, W. L.: The control of chronic asthma. Allergol. V Congresso International, p. 449, 1964.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.