

# Histoplasmin and Tuberculin Sensitivity In Texas Infants and Children

By GILBERT B. FORBES, M.D., and CHARLES C. CHANG, M.D.

**H**ISTOPLASMOSIS, a disease of variable symptomatology caused by the fungus *Histoplasma capsulatum*, was first described by Darling in 1906 (1). The disease has received increasing attention during the past decade. An increasing number of clinical instances of the disease are being recognized. In 1941, a histoplasmin skin test was developed (2, 3). And in 1945 researchers reported that a large number of tuberculin-negative individuals with roentgenographic evidence of pulmonary calcification reacted to the skin test antigen, suggesting that a benign form of the disease exists (4).

Extensive skin test surveys have revealed that the percentage of positive reactors among the young adult population is highest in the Ohio, Missouri, and lower Mississippi valley regions and tends to fall off rather sharply with increasing distance from this area, the values varying from 88 percent positive reactors in Kansas City, Mo., to less than 5 percent in the northwest and extreme southeastern parts of the United States (5-7).

In 1951 histoplasmin skin tests were done on 441 infants and children born in Texas. The

subjects were selected at random from patients on the wards of the Children's Medical Center, patients attending the out-patient clinic, and from the pediatric patients seen at Parkland Hospital and St. Paul's Children's Hospital, all in Dallas, Tex. Infants cared for at a nearby foundling home and older children hospitalized at the Scottish Rite Hospital for Crippled Children were also included. The subjects ranged in age from a few days to 16 years. The skin testing program was conducted during the period from April to August 1951.

## Material

The histoplasmin (lot H-42) was obtained from the Division of Chronic Disease and Tuberculosis, Public Health Service. It was in the standardized dilution of 1:100. Tuberculin tests were made simultaneously, using old tuberculin in a strength of 1:1000 (0.1 mg.).

The histoplasmin injection (0.1 cc.) was made intradermally on the volar surface of the left forearm, while that of the tuberculin (0.1 cc.) was made on the volar surface of the right forearm. Separate sets of needles and syringes were used. The reaction was read 48 hours after the injection and was considered positive if the area of induration was 5 mm. or more in diameter, without regard to erythema.

## Results

Among the 441 histoplasmin and tuberculin tested children, there were 31 positive histo-

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*Dr. Forbes is chairman of the department of pediatrics, Southwestern Medical School of the University of Texas, and Dr. Chang is now resident house officer, Willard Parker Hospital, New York City. Dr. Jerry E. Miller, clinical associate professor of radiology of the Southwestern Medical School, interpreted the roentgenographs.*

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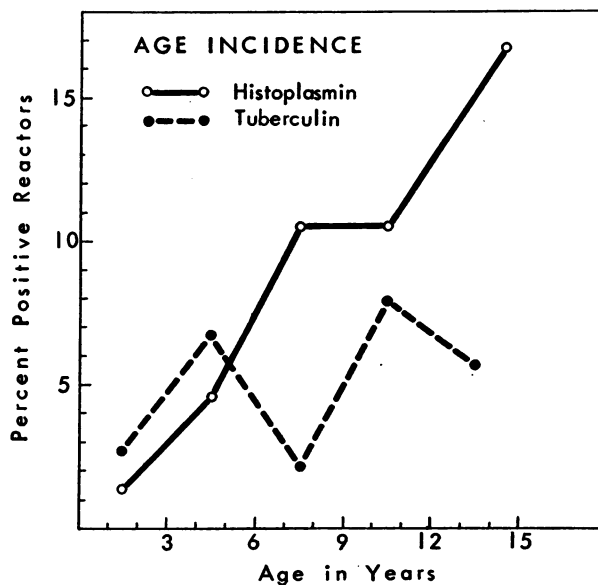
plasmin skin tests and 20 positive tuberculin skin tests, an over-all incidence of 7.0 and 4.5 percent, respectively. Two children reacted to both histoplasmin and tuberculin. The total number and percentage of positive results were further grouped according to sex, group, birthplace, and type of disease on admission to the hospital or clinic (table 1).

Although there are minor differences in both tuberculin and histoplasmin sensitivity among the three groups and between sexes, these differences are not statistically significant. Individuals born and reared in the rural areas of Texas would appear, at first glance, to have a definitely higher degree of sensitivity to histoplasmin than Dallas residents, but this difference also is not significant statistically. Nor is there a significant difference ( $P=0.08$ ) in histoplasmin sensitivity between individuals suffering from some chronic disease and those who exhibited no disease at the time of testing.

Roentgenograms of the chest were taken for each child who showed either a positive tuberculin or a positive histoplasmin skin test, or both. Of the 20 subjects with positive tuberculin tests, 9 (45 percent) had pulmonary calcification. Among the 31 with positive histoplasmin tests, 8 subjects (25.8 percent) had roentgenographic evidence of pulmonary calcification.

In studying the influence of age on both histoplasmin and tuberculin sensitivity, we find a trend toward increased histoplasmin sensitivity as the subjects become older; indeed none of the 94 subjects in the 0-2-year age group exhibited a positive test. The pattern of tuberculin posi-

Effect of age on histoplasmin and tuberculin sensitivity, 441 Texas children



tivity is much less regular and shows no consistent age variation (table 2). The effect of age on histoplasmin sensitivity can be seen better in the chart where the subjects are divided into larger age groups on an arbitrary basis.

#### Discussion

Palmer observed 21 (34.4 percent) positive histoplasmin reactors among 61 Texas student nurses (6). Christie and Peterson in a survey of histoplasmin sensitivities at Vanderbilt University recorded 7 positive tests (25.9 percent) among Texans (4). Beadenkopf and his associates, working at the University of Chicago,

Table 1. Comparative incidence of sensitivity to tuberculin and histoplasmin related to sex, race, birthplace, and type of disease on admission to hospital or clinic

Number and percentage	Sex		Group			Birthplace		Type of disease		
	Male	Female	White	Negro	Latin-American origin	Dallas	Non-Dallas	Acute	Chronic	None
Total number	227	214	258	138	45	228	213	165	225	51
Tuberculin positive:										
Number	11	9	13	4	3	13	7	6	12	2
Percent	4.8	4.2	5.0	3.0	6.7	5.7	3.3	3.6	5.3	3.9
Histoplasmin positive:										
Number	18	13	22	5	4	8	23	9	21	1
Percent	7.9	6.1	8.5	3.6	8.9	3.9	10.8	5.5	9.3	2.0

found an incidence of 30 percent among 100 students who had resided in the State of Texas for most of their lives (7). In a study of 200 adults at the Parkland Hospital, Dallas (both in-patients and the hospital personnel were tested), an incidence of 31 percent positive reactors was observed (8). All of these studies were done on adults or individuals in the late teens. Except for Chapman's series, none of the individuals tested were living in Texas at the time the test was made.

Comparison of our results with those reported for children from the St. Louis, Mo., area (9), reveals that the increase in percentage reactors with age is less precipitous in the Texas series. For example the incidence of positive reactors in the 3- to 6-year-old St. Louis group is approximately four times that of the comparable age group of Texas children, and there is a threefold difference in the 6- to 12-year age group. Consequently, it would appear that individuals of all ages have a higher incidence of

histoplasmin reactivity in the St. Louis area than individuals in the region around Dallas.

It is of interest that none of the patients in our series was considered to have clinically manifest histoplasmosis.

### Summary

Histoplasmin and tuberculin skin tests were performed on 441 infants and children whose birthplace and principal residence was in Texas. Most of the patients studied lived in Dallas or the immediate surrounding territory. A significant degree of relationship between age and histoplasmin sensitivity was noted.

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**Table 2. Incidence of tuberculin and histoplasmin sensitivity related to age**

Age (year)	Total number	Tuberculin		Histoplasmin	
		Number	Percent positive	Number	Percent positive
0-1	57	1	1.8	0	0
1-2	37	2	5.4	0	0
2-3	52	1	1.9	2	3.8
3-4	30	3	10.0	1	3.3
4-5	25	0	0	1	4.0
5-6	33	3	9.1	2	6.1
6-7	28	0	0	3	10.7
7-8	32	0	0	1	3.1
8-9	35	2	5.7	6	17.1
9-10	28	1	3.6	5	17.9
10-11	30	5	16.7	3	10.0
11-12	18	0	0	1	5.6
12-13	16	2	12.5	3	18.8
13-14	12	0	0	1	8.3
14-15	8	0	0	2	25.0

