Histoplasmosis in Infancy: A Family Study*

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The purpose of this paper is to present a family study of a case of histoplasmosis probably infected by contaminated coal dust. This is the first report where coal dust appears to serve as a vehicle of transmission for histoplasmosis.

Case History

This four-month-old boy (R.B.) was born at the University of Kentucky Medical Center on October 28, 1964, and discharged as a normal baby on November 5, 1964. He was readmitted at 12 weeks of age on January 22, 1965 with diagnosis of hepatosplenomegaly of unknown etiology, anemia and upper respiratory infection. Skin tests for histoplasmosis and tuberculosis were negative. Serum agar gel diffusion for histoplasmosis antibodies and bone marrow culture were also negative. He was discharged on January 27, 1965 to be followed in the clinic. A month later on February 28, 1965 he was seen again in the emergency room with an upper respiratory infection. The bone marrow aspiration done at that time showed numerous organisms compatible with Histoplasma capsulatum by histopathologic examination. He was readmitted to the hospital on March 3, 1965 with the diagnosis of histoplasmosis. Later, the culture of this bone marrow was positive for Histoplasma capsulatum. Physical findings during that admission revealed a few rales in the right middle lobe and basal regions, and liver and spleen enlargement. The remainder of the physical examination was within normal limits. Chest film showed a right upper lobe infiltrate, which was not present on the previous admission. PPD and histoplasmin skin tests on admission were negative, but two weeks later the histoplasmosis skin reaction and serology tests had converted to positive. He was treated with 1 mg./kg. of amphotericin-B for a total of 23 days. The total dose of amphotericin was 77 mg. His condition improved rapidly and he was discharged April 1, 1965.

Family Study:

The family was investigated while the patient was under treatment for histoplasmosis on the pediatric ward. Several visits were made to the patient’s residence in March in order to collect the necessary information about the source and the mode of transmission of the disease. The family consisted of mother, father, and four siblings who were living in a three room house near Paris, Kentucky. The family had rented this property approximately eight months previously. There were four buildings, a barn, a coal shed, an outhouse and the family dwelling place. The baby was sleeping in the living room in a cradle which was very close to a coal stove that supplied heat for the dwelling. The whole family was tested with histoplasmin and all of them showed positive skin tests, but the chest x-ray film and serum precipitin test did not indicate any active disease.

The family residence was visited on March 12 in order to obtain soil samples to test for H. capsulatum. The family did not have any chickens nor were they aware of any chickens having been raised on the premises previously. There was no bird roosting site in the vicinity. Five soil samples were collected and placed in closed cottage cheese containers using sterile tongue blades. Two were collected beneath large shade trees in the front yard, two around the foundation of the house and one from the dirt floor of the garage. The specimens were brought back to the laboratory and testing for H. capsulatum in mice using an indirect oil flotation method. These tests were all negative for the fungus. On March 19, four additional soil samples were collected of which two were from the garage and two from beneath the front steps of the house. These also proved negative.

Two weeks later the mother related she had learned that the previous occupants of the house had kept chickens in a small shed which is currently being used to house coal for the stove. She brought into the laboratory a sample of the coal dust (approximately 20 gm.) which was tested and found negative for H. capsulatum. Two weeks later, four additional samples which consisted of coal dust, soil and debris from the dirt floor were collected by the authors from this site and tested for H. capsulatum. Each of these four samples collected from the floor of the coal shed was positive for the fungus. All mice that were injected with these specimens were infected with H. capsulatum.

Discussion

Histoplasmosis is a common infection particularly in the Mississippi Valley area. Many cases have been reported from Kentucky, Missouri, Ohio, and Tennessee. Histoplasmosis is a disease of nature, not a
contagious disease that can be transmitted from person to person. The organisms grow in the soil when environmental conditions such as temperature and humidity are satisfactory for growth.

There is a definite relationship between the presence of chickens or birds and growth of H. capsulatum. Thus chicken houses have been frequently found to be infected although it does not appear that the chickens carry the disease. However, the presence of their excreta in the soil aids in the growth of the organism. Most human infections appear to be contracted in such places particularly when the soil is stirred up and dust is raised, and spores inhaled.

The wide spectrum of the disease has been well described. The acute disseminated type of histoplasmosis is common in infants and young children. This case was an example of the disseminated type of disease. It is important to investigate the source of infection when a very young patient such as the one reported, becomes infected. It is possible that an infant who stays most of his time indoors, and never contacts such suspected sources as chicken houses or barns could be infected by some less common means. Another example is a three-month-old child with acute disseminated histoplasmosis who apparently had been infected from a feather pillow. In our case the coal dust and debris in the old chicken house was the only source from which the organism could be recovered.

REFERENCES

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TRANSPLANTATION OF HUMAN HOMOGRftT AORTIC VALVE

The use of 4 per cent formaldehyde, buffered to a constant pH of 5.6, as a preservative for human homograft cardiac valves has been presented. The experiences of others with aortic segment preservation is discussed, and the possible advantages of formaldehyde are outlined. The method is simple, rapid, self-sterilizing and efficient, and the problems of developing a donor valve bank are minimal.

The authors believe that protein denaturation retards degeneration of the donor tissue and prevents rejection by the host. Elastic networks are preserved, and structure is maintained while host replacement of the valve homograft is taking place.

The object of this communication has been to report a 24-month follow-up of a successful homograft aortic valve transplantation in a 29-year-old man. The homograft valve had previously been preserved for more than six months in formaldehyde.


BACILLUS CALMETTE-GUERIN VACCINATION

The possible influence of bacillus Calmette-Guerin vaccination upon the Kveim reaction has been studied in patients with chronic active sarcoidosis and in patients apparently recovered from sarcoidosis. No conversion or augmentation of the Kveim reaction after bacillus Calmette-Guerin vaccination was observed. Patients recovered from sarcoidosis and those with active disease failed alike to develop and maintain sensitivity to tuberculin after bacillus Calmette-Guerin vaccination. The Kveim test with considerable but incomplete accuracy distinguishes active from recovered sarcoidosis, but is not a measure of the sarcoidal diathesis.