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DEPARTMENT OF THE ARMY
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CASE OF COCCIDIOIDOMYCOSIS OF THE LUNGS

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Coccidioidomycosis is one of the least-known diseases in Poland. It occurs endemically in the southwestern part of the United States, in Northern Mexico, Bolivia, Argentina, Venezuela, and Paraguay (10, 12, 14, 15). It is encountered less frequently in Hawaii, Alaska, Italy, Great Britain (15) and Africa (9), as well as the USSR (7, 9, 17). Up to the present no case of coccidioidomycosis had ever been reported in Poland (6).

The Coccidioides immitis fungus propagates best in alkaline and dry soils, in a dry, hot climate, ~~(7, 9, 15)~~. The vegetative phase in the development of this fungus takes place in the ground. Colonies of the fungus have a downy appearance, the filaments of which, enclosing the reproductive organs (chlamydospores), disintegrate. The spores are light in weight and the wind transports them together with dust.

Most frequently individuals are infected through the respiratory system, more rarely through ~~skin lesions~~ cutaneous injury or the

mucous membrane of the oral cavity, as well as the digestive tract. In addition to man, domestic animals, rodents and lizards are subject to infection. The possibility of direct infection of humans from animals has not been proven, but rodents should be considered as a natural reservoir of infection.

The parasitic phase of development of this fungus is observed in humans and animals. The chlamydospores develop in the organism into a spherule which contains endospores. In the organism they cause a cell reaction of a granuloma type replete with giant cells in which spherules are frequently encountered. The enlarging spherules burst and release endospores, and these in turn grow into spherules.

Most frequently the pulmonary form affects people between the ages of 20 and 50. Cases have also been reported, however, in children (16) and elderly persons (3).

Symptoms of the disease are normally observed 10 to 21 days after infection. In the initial phases the disorder is most frequently of a mild character. Patients frequently complain of pains in the chest, headaches, run a fever, are troubled by a dry cough or cough up small quantities of sputum, sometimes containing blood. These patients lose appetite, lose weight, feel pains in the joints, and swelling may occur in the vicinity of the knees and knuckles (descriptively referred to as "the bumps"). On occasion the skin, particularly in women, shows typical nodal erythema efflorescences. Less frequently there occurs polymorphic erythema on the upper extremities, face and chest.

Initial infection is frequently (70 percent of cases) without symptoms. In about 30 percent of cases, however, there are signs of acute inflammation of the respiratory organs, and changes occur in the lungs and tracheal-bronchial nodes.

Radiology reveals a widening of the cavital shadows as well as a spotty shadow located most frequently in the lower and middle regions of the lung (5). Normally these changes recede after one to two weeks. Sometimes, however, as a result of necrosis, cavitations form in the lung parenchyma (5, 8, 14). There is then sometimes the development of small, unsaturated, at times calcified tubercle-like granulomas. A round shadow is also observed, 1 to 3 cm in diameter (coccidioidomata).

A secondary form, disseminated and chronic, occurs in 0.2-1 percent of cases. The clinical polymorphism of this form depends on blood circulatory and lymphatic diffusion. Mortality in such cases is high, in the order of 50-60 percent. Dissemination is observed in the lungs, vertebral column, ribs, skin, subcutaneous tissue, spleen, liver, kidneys and brain (7, 9, 17).

Diagnosis is based on detecting spherules of the Coccidioidomyces immitis fungus in the sputum. These are 20-70 microns in diameter, covered by a thick double-refracting envelope; mature forms contain endospores. The generation of endospores is a characteristic feature permitting differentiation between Coccidioides immitis and other fungi.

Also of major diagnostic importance are coccidioidin skin tests (similar to tuberculin tests). The test will show positive

three to four weeks after initial infection. Forms of disseminated coccidioidomycosis are frequently, however, accompanied by anergy, which is a very poor sign.

Precipitation reaction is positive in 90 percent of patients, from the fourth week to the fourth-fifth month after infection.

The complementary bond reaction titer is large (1:12-1:256) in serious ~~diffuse~~ disseminated cases (10) and in the order of 1:8 in other cases, showing up several years after affection (16).

Sometimes diagnosis can be accelerated on the basis of a biopsy of supraclavicular ganglia according to Daniels' method (3).

Symptomless cases or where there is only incrustation or cavitation as well with a diameter of less than 2cm as a rule do not require treatment.

Sulfadimezine (9) with amphoteracine B is recommended in ~~diffuse~~ disseminated cases (16) as well as in cases of co-occurrence of coccidioidomycosis and histoplasmosis (11).

If an isolated area of cavitation lingers for more than six months (14), its diameter exceeds 4cm or there is repeated bleeding from the respiratory passages (10, 13) a pulmonary tissue resection is recommended. Aronstam (1) cured 108 out of 112 patients operated on with this method. Some patients had to be given additional amphoteracine B in the postoperational period.

One should emphasize that coccidioidomycosis can co-occur with other diseases, particularly tuberculosis (5, 13) and

histoplasmosis (11).

Bachard et al (2) observed a case of coccidioidomycosis of the lungs the clinical symptoms and radiological picture of which were similar to sarcoidosis.

Coccidioidomycosis infection provides lasting immunity. In connection with this Converse (4) made an evaluation test of live and killed vaccine on monkeys. He concluded that killed vaccine provides less immunity but is safer. It would be worth while to verify his findings on humans.

Case History

26-year-old female (case history No 434/106/63), sent to the phthisiatric clinic of the Pomeranian Medical Academy, suspected of having pulmonary tuberculosis.

The disorder began in December 1962, with a loss of strength, coughing, fever and chest pains. Upon discovery of changes in the lungs by X-ray ~~investigation~~ examination, the patient was recommended streptomycin and PAS. The patient failed to improve. Her condition even worsened, with blood noted in the sputum. The patient was then sent to this clinic.

The patient has had epilepsy since the age of 14. A physical examination established the following: a deadened sound along the edge of the left scapula and a few sonorous bubble-like sounds above that region.

The result of additional basic tests such as morphologic blood composition, urine test, ~~in~~ and rate of blood corpuscle drop were normal.

Radiologic chest examination: rounded shadow about 4 cm in diameter, medium saturation, at the height of the fourth rib on the left side (Figure 1).

Diagnosis included possibilities of pulmonary tuberculosis, neoplasm, non-typical pneumonia, mycosis, hydatid, encysted interlobar exulation.

The sputum revealed non-typical bacterial flora susceptible only to erythromycin. In connection with this we treated the patient with erythromycin as well as on the basis of symptoms. No tuberculosis bacteria or neoplastic cells were discovered in the sputum. On the other hand numerous fungus cells were discovered, identified as Coccidioides immitis.

During the first week the patient was a in subfebrile state, had a persistent dry cough, felt weak, and perspired constantly. In the following week all fever was gone, and the coughing and weakness gradually disappeared. An X-ray taken three weeks later showed a reversal of changes. The diameter of the described shadow had decreased to about 1.5 cm.

After three weeks in the clinic symptoms of epilepsy in the patient became more intense, and as a result of dysphoric agitation the patient had to be transferred to the psychiatric clinic, where she remained for two months.

Chest X-rays taken when the patient left the clinic (Figure 2) as well as photographs taken six and 12 months later, two and three years later at the Swinoujscie Tuberculosis Dispensary failed to reveal any pathologic changes in the lungs.

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