THE STUDY OF MYCOFLORA OF SPUTUM AND SEROLOGICAL DIAGNOSIS OF BRONCHO-PULMONARY MYCOSIS IN WORKERS IN SLAUGHTER HOUSE IN CAIRO

THESIS

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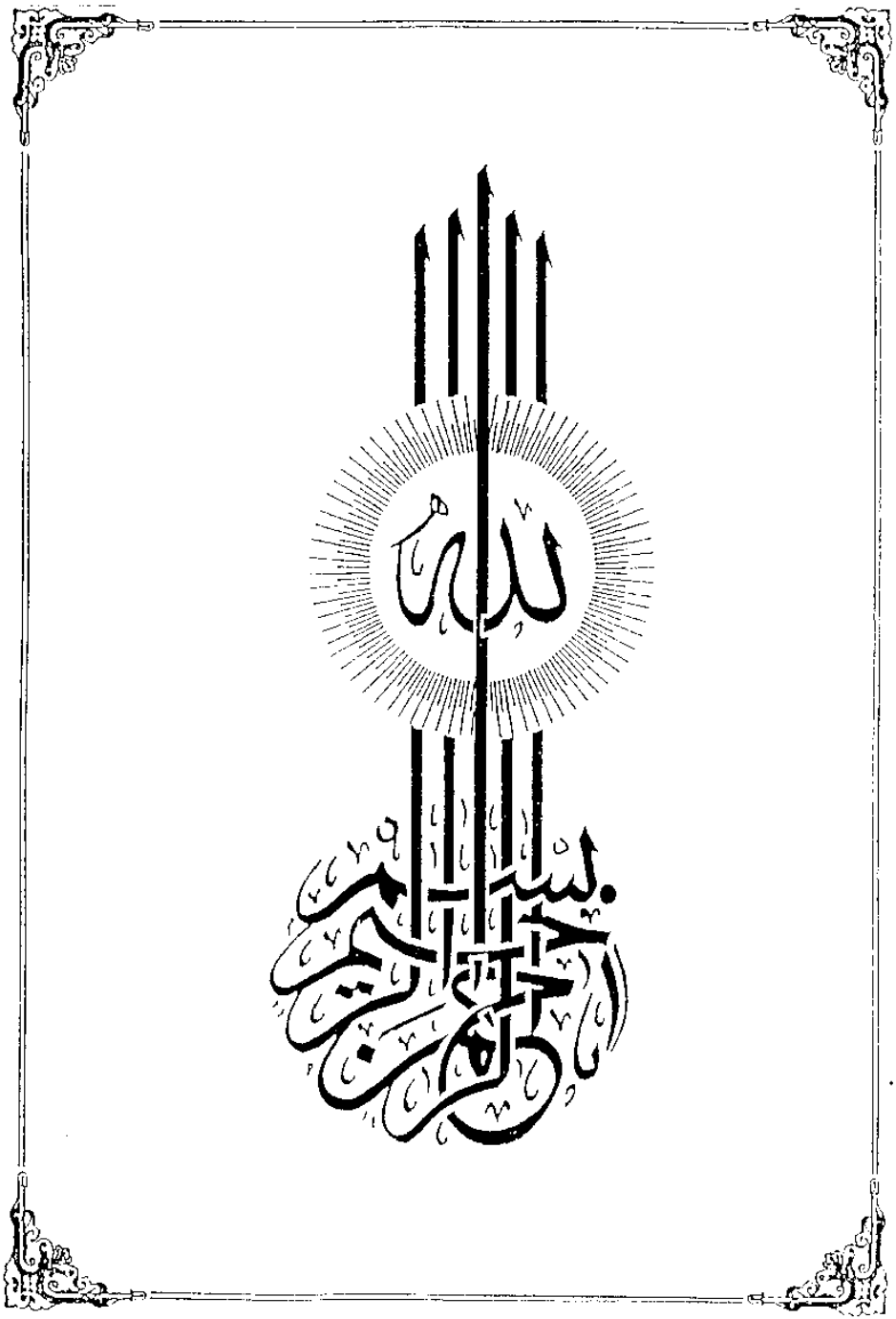

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INTRODUCTION

There is no doubt that broncho-pulmonary mycosis in our countery still does not take the same importance in diagnosis as that made in the other broncho-pulmonary diseases. Several factors may be responsible for this defect. It may be due to that broncho-pulmonary mycosis in Egypt was thought to be more or less rarer than in some other counteries with the exception of some species as genus Aspergillus which are world wide. The diagnosis needs special laboratories and special techniques, which are not available in most of our hospitals and dispensaries ie cultural methods, serology , skin tests and pathological examinations . Also the awareness of the different clinical pictures and techniques adopted in confirming the suspicion of the disease is still lacking.

The staff of Ain Shams chest medical department are looking for the entity of Broncho-pulmonary mycosis in Egypt, As slaughter houses in Cairo are suitable sites for growth of fungi(Rifai ,1969) , the individuals engaged there were the aim of this study.

REVIEW OF LITERATURES
SYSTEMIC MYCOSIS

The increased incidence of systemic fungus infection in the last few years may be due to a real or an apparent rise. The great numbers of patients with pulmonary aspergillosis, now recognised may simple reflect a greater awareness of this condition. The systemic fungus infections are more frequently seen in the last years because they occur as a super added infection in chronic and malignant diseases, for more use of antibiotics and corticosteroid therapy, John P.Ut3 (1975). Austwick (1972) has summarized the pathways through which fungi can produce disease. Fungi cause three main types of animal and human disease :

Mycoses : diseases resulting from the invasion of living tissues by the fungus.

Allergies: diseases resulting from the development of hyper sensitivity to fungal antigens.

Toxicoses: consisting of the mycotoxicosis resulting from the ingestion of toxic fungal metabolites formed in food, and the mycetism resulting from the ingestion of toxic fungal fruiting bodies.

Fungal pathogenicity thus covers a much wider range of activity than that seen in other pathogenic micro-organisms, and its height of complexity may be realized when it is possible for all three types of diseases to be present in one individual, each caused by the same species of fungus playing three different roles at one and the same time. After all, infection and allergy together due to Aspergillus fumigatus are not uncommon in man.

BRONCHOPULMONARY ASPERGILLOSIS

The first anatomical descriptions date from Furbriger (1837), Virchow (1842), Sluyter (1847) and then Osler and Dieulafoy, (1890) who studied the first clinical manifstations of the disease. In 1890,Dieulafoy, Chantemesse and Vidal observed in pigeon fanciers and hairdressers, lung disease of pseudo-tuberculous appearance, resulting from the spores of Aspergillus contained in the millet grain and the flour of rye used in these professions . It was in 1898 that Renon in his thesis signalled the appearance of Aspergilus in the clinical field. A little later, Pasteur Vallery Radot and Giroud (1928) described in five workers in a malting house who had inhaled massive amounts of Aspergillus fumigatus or A clavatus, the appearance of fibrile respiratory manifstations with the presence of precipitins in their serum. It is about 30 years since the pathogenic role of Aspergillus fumigatus was well established . In 1938, Deve published the observation of an intrabronchial megamycetoma which developed into a bronchiectatic aspergilloma.

This has been well described in the works of

Monod, Pesle and Secretain (1951) and Bariety, Poulet and Monod (1961) and Meyer and Rapand (1962). The treatment is essentially surgical because the classical medical treatments, such as iodide derivatives, are inefficacious. In the last 20 years, the history of the disease has taken a new turn. In 1952 , Hinson, Moonand Plummer described allergic aspergillosis which carries the same name today. Its immunological features were shown in 1959 by Pepys et al., who demonstrated the presence of anti-aspergillus precipitating antibodies in the serum of the patients. Additional observations have subsequently been made in England by Campbell and Clayton (1964); Frankland and Davies (1965) and Henderson (1968) who reported very numerous cases of this disorder; then in Holland, by Orie, de Vries and Kirksta (1960) ; in france by the work of the school of lille (Gernez - Rieuz et al., 1963); and by the parisian school (Drouhet et al 1963) who continued these researches to show that the bronchiectatic megamycetoma is in fact a parasitic growth, usually in an organ damaged with bullae, tuberculous sequelae, or pneumoconiosis. At about the same time, another form of aspergillosis was described , with dissemination of the aspergillus throughout

the whole of the body in a septicaemic form with pulmonary , cutanous and visceral localizations, it was chiefly the paediatricians who showed the frequency of this disorder in debilitated or deficent infants, or in subjects treated with antibiotics for very long periods, as in the leukaemias, or in those who had surgical intervention for cardiac disease, for example, and one speaks of this as opportunistic parasitism. As for as therapy is concerned, we draw attention to the concomitant discovery of a number of antifungal agents, such as Mycostatin and in particular Amphotericin and more recently, the new antimycotics such as pimafucin and clotrimazole. Claude Molina 1976.

Fungi of the genus Aspergillus are ubiquitous, commonly foundi in soil and decaying vegetable matter, producing spores which readily become airborne. Their ability to grow on many substrates under a wide range of environmental conditions may account for their capacity to produce diseases in man, especially A.Fumigatus which grows well at body temperature, whilst there are reports of infections in almost every organ in the body (Austwick 1965), the respiratory tract is the most important. A.fumigatus may act as an allergen, mediating

type I reactions in the bronchi and causing asthma; it may mediate type I and III reactions in atopic subjects causing asthma; and pulmonary eosinophilia ; it may grow saprophytically in damaged areas of lung producing the aspergillus mycetoma or aspergilloma. The aspergilloma is associated with minimal tissue reactions, the fungus growing as a saprophyte on tissue debris lining the pre-existing cavity. In these cases the skin tests are usually negative but an immediate or late reaction has been reported in about 30% of patient with mycetoma (Longbottom & Pepys 1964). A. fumigatus may also cause an invasive infection in the lungs especially in patients with immune deficency or paresis from any cause , for instance those on corticosteroids or immunosupressent therapy and in patients with malignant lymphoma or leukaemia. In some of these patients precipitins have been domenstrated. In immune deficency disorders, fungus infection are particularly common in those with evidence of impairment of cellular immunity, suggesting that protective immunity to fungal infection involves both and sensitized lymphocytes .

Aspergillus fumigatus occured in the sputum of 10%

of bronchiectatic patients and higher proportion of asthmatic patients (Rieddell and Clyton 1958, Pepys et al., 1959 & Madkour et al 1979).

The isolation of the fungus by the culture of sputum is not conclusive evidence of its pathogenic role. By the improved methods of diagnosis the criteria of diagnosis of broncho pulmonary aspergillosis has been more reliable and more frequently recognised, also become immunological factors play a major part in the development of systemic fungus diseases.

Lemerciery et al 1958, reported a chronic case of chest infection which remained undiagnosed for 12 years, treated as tuberculosis and after that as pulmonary abscess. The correct diagnosis was confirmed by the culture of aspergillus fumigatus from sputum.

Pepys (1958). described the allergic reactions to aspergillus fumigatus in man and mentioned that it causes : Rhinitis, conjunctivities, and asthma, and he reported that :

(1) Respiratory infections are associated with pulmonary eosinophilia.

(2) The fungus is found more frequently in the sputum of asthmatics with pulmonary eosinophilia than in the sputum of patients with other respiratory diseases.

(3) By using skin prick test with extract of aspergillus fumigatus, A.flavus , A.niger, A.terries, positive reaction occured to all species in all hypersensitive subjects, and the extensive positive reactions occur with pulmonary eosinophilia.

So to prove that the fungus plays a part in the clinical picture it depend not only on the evidence of the presence of fungus in the sputum but also an the immunological conformation.

Sidransky (1959) reported experimentally that the adminstration of cortisone alone or with antibiotics (penicillin, achromycine) enhanced the susceptability of mice to subsequent infection by Asp.flavus.

Orie et al. (1961) described the growth of Aspergillus in the human lung in a series of 44 cases . The growth of the organisms showed in many respects, the character of saprophytism. No inflamatory reaction, no sputum

production or asthmatic symptoms and obscence of pathogenic reaction were found. Unless concomitant bacterial infection occured, the pathological manifstations (productive cough, asthmatic symptoms , culture of fungus from sputum) were considered to be due the fungus.

Bech 1961 , reported 2 fatal cases of diffuse bronchopulmonary aspergillosis. The fungus (A fumigatus) was cultured from the sputum it is thought that both cases started as bacterial infection, and because they were treated with massive antibiotics, fungus infection was stimulated.

Ramanski (1963). described the role of moulds and fungi in the aetiology and pathology of bronchial asthma, he reported:

(1) most patients had positive reactions to more than one of the fungi species.

(2) No correlation was found between the number of fungal spores in the air and the frequency of asthmatic attocks of patients in spite of positive skin reaction but these attacks were related to some extent to those fungi found in homes.