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PULMONARY MANIFESTATIONS IN FILARIASIS.(U)
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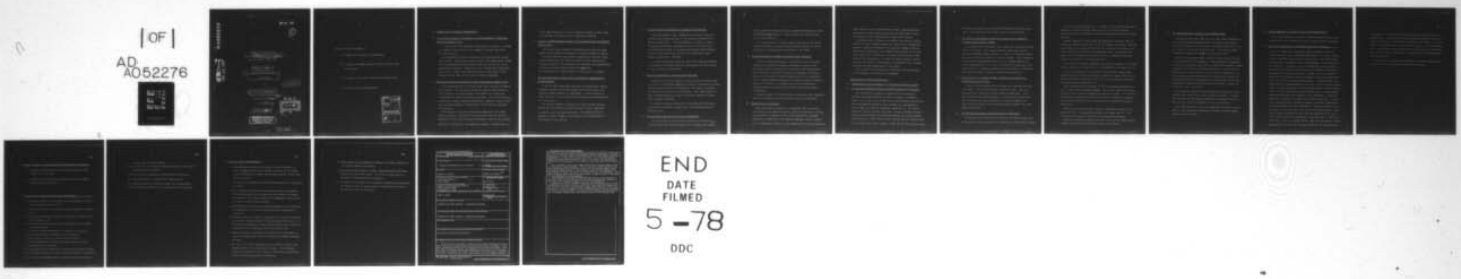

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BY

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This final report includes :-

A) Summary of all research accomplished.

B) An index of progress reports abstracts issued under the contract.

C) An index of all papers submitted for publications.

D) A list of major accomplishments.

A) SUMMARY OF ALL RESEARCH ACCOMPLISHED :*

I. A preliminary report on incidence of microfilaraemia in filariasis carriers at Giza, A.R.E.

In this study 1232 inhabitants from Manshat El Bakary; a village 15 kilometer south of Cairo were examined by 20 mm blood films for microfilariae.

The percentage of persons positive for microfilaraemia reached 10.7 percent. Among males this was 12.87 % and among females 9.66%. These percentages may reach several times more by the use of new concentration methods. Comparison of our results with those previously done in Egypt shows the endemicity of filariasis in this village and the need of more serious control programmes.

2. Preliminary report on filariasis survey at Manshat El Bakary, Giza.

2163 inhabitants from a village nearby Cairo (Manshat El Bakary) were examined. The aim was to study the clinical manifestations of filariasis in a village known to be endemic for filariasis. A questionnaire sheet was specially prepared. The age distribution, occupations, endemic diseases encountered, symptoms, clinical findings and pleuropulmonary manifestations found were all presented and discussed.

Bilharziasis, Ascariasis, Oxysuriasis and Malaria are common endemic diseases. Affection of genitalia was found in (5.40 %). Hydrocele (4.72 %) and testicular enlargement (4.22 %) and enlarged epididimis (2.48 %) were the commonest findings. Elephantiasis of

lower limbs occured in (I.I5 %), lymphatic oedema of lower limbs was observed in (6.84 %) of the inhabitants examined.

3. Clinico - Parasitological survey of filariasis in Kafr El Ghattaty Cairo, A.R.E.

The present paper stresses the importance of using the newer concentration methods for detection of microfilaraemia in Egypt.

The high infection rate (6.87 %) observed by using the traditional 20cmm blood film calls for better control measures and treatment program. The prevalence of filaraemia and elephantiasis in young age group indicates active transmission.

The urgent need for better control of filariasis is stressed.

4. The counting chamber versus thick drop method in evaluation of microfilaraemia.

A total of 492 inhabitants from Kafr El Ghatatty were simultaneously examined for microfilaraemia by the thick smear and counting chamber methods for comparison. I7 were positive by thick smear i.e. 3.4 %, while II0 were positive by counting chamber i.e. 22.3 %.

The counting chamber technique is an easy and more accurate method for the detection of microfilariae in blood specially in patients with low microfilaraemia. This method should be adopted in Egypt to draw a true profile of the distribution of the disease in our country.

5. A study of blood eosinophilia in relation to filariasis

Blood eosinophilia (400 - 4085/cmm) was found in 56.8 % of patients with microfilaraemia in the village of Manshat El - Bakary nearby Cairo. Also eosinophilia is present in 36.I % of non-microfilaraemia individuals living in the same area. The eosinophilic count in the groups was mostly below I000/cmm. In I4 % of microfilardemic patients the eosinophilic count ranged between I000 - 2000/cmm.

In the non-filaraemic group the upper limit reached 23I0/cmm. The syndrome of tropical pulmonary eosinophilia was not reported in the two groups investigated.

6. Bronchial challenge in patients with filariasis

Inhalation of filaria antigen in patients with filariasis did not reveal a significant statistical change in ventilatory function studies measured before and immediatly, I0 minutes, 20 minutes , 30 minutes and 24 hours after inhalation. This shows absence of type I hypersensitivity or type III delayed reaction following this bronchial challenge.

The cause of airway obstruction in patients with filariasis may be due to bronchial changes other than hyperreactivity of bronchial tree.

7. The diffusing capacity of the lung in filariasis

The measurement of the diffusing capacity of the lung (D_{Lco}) in 50 patients with microfilaraemia and 4 patients with elepha-

ntiasis revealed normal mean values (I6.83 ml/min/mmHg and I6.60 ml/min/mmHg respectively). These 2 values were also 80 % and 76 % of the predicted.

This study giving an overall index of function of the alveo-capillary membrane in these patients denotes absence of lack of uniformity of ventilation and perfusion in the lungs.

8. Bronchofibroscopic findings in patients with filariasis

The use of bronchofibroscopy in 38 patients with filariasis revealed the presence of mucosal thickening of bronchi with invisible bronchial cartilage in I7 patients with elephantiasis and irregularity with wide longitudinal infolding of bronchial mucosa in I9 patients (2 with filaraemia and I7 with elephantiasis). Other findings described were widened septum of segmental bronchi (7 patients), broadened main carina (8 patients), narrowed bronchi (5 patients) and diffuse pale mucous membrane (2 patients).

Mucosal changes of the bronchi due to filariasis were suggested. The term bronchopathy of the bronchial mucosa is introduced.

9. Bronchopathy in filariasis

From I08 bronchial biopsies in 36 patients with filariasis, thickening of the bronchial mucosa, epithelial hyperplasia diffuse and localised, infolding of the surface epithelium, squamous metaplasia, thickening of the basement membrane, chronic nonspecific inflammatory reaction in the subepithelial tissues,congestion,

edema together with increased tissue spaces, lymphangiectasia, hyperplasia of deep mucous glands with increased goblet cells and fibrosis of the subepithelial tissues were reported.

Injecting filaria antigen in I4 rabbits sacrified at various periods of time, revealed presence of interstitial inflammatory reaction, followed by bronchial and vascular changes including thickening, hyperplasia of the smooth muscle fibres and of bronchial mucosa with infolding of the mucosa and narrowing of the lumen of the bronchioles. The media of blood vessels is thickened and the intima is infiltrated by inflammatory cells causing narrowing and even obstruction of the lumen.

These changes are attributed to filariasis and the presence of bronchopathy in filariasis is suggested.

Immunological studies in filariasis :-

I0. Immunoglobulin and complement in filariasis patients in Egypt.

II. An immunohistochemical study of bronchial mucosa in filariasis.

Two collaborative studies on samples from our filariasis patients have been done with Dr. Gene I. Higashi, US NAMRU-3, Cairo. First, sera from patients with microfilaremia and patients with lymphedema/elephantiasis were assayed for immunoglobulin , levels (IgG, IgA) and for complement component C3. The results agree with similar studies from India. Second, bronchial mucosal biopsies were obtained from selected patients and studied immunohistologically. These results showed typical IgA-rich plasma cells in the mucosa with lesser numbers of IgG, IgM and IgE positive cells.

No filarial antigen could be detected by immunofluorescent procedures. Two manuscripts are being prepared for publication.

I2. The indirect haemoagglutination test using filaria antigen in patients with bronchial asthma.

227 subjects were included in this study; I37 asthmatic patients and 90 as controls. The antigen used was crude camel filaria antigen (Acanthocheilonema evansi). In I6.7 % of asthmatics their sera gave a positive reaction to filaria antigen. From asthmatics with positive haemoagglutination (H.A) 22 % showed moderate to marked eosinophilia. As H.A test is specific to filariasis, this study forwards a supportive evidence of the relation of filariasis and bronchial asthma in tropical pulmonary eosinophilia.

I3. A field trial of counting chamber technique for detection of microfilaraemia in Qaluib.

A total of 2648 inhabitants from Qaluib were examined for microfilaraemia. The counting chamber method was used. This is a more sensitive, accurate and easy method in field work. 4.I % were found to have microfilaraemia. As this method is more superior to thick blood film examination it should be adopted in Egypt in field surveys for filariasis and must replace the thick blood film method.

I4. The search for pulmonary manifestations in filariasis.

I38 patients with filariasis of which 45 had elephantiasis were the subject of detailed clinical, laboratory and radiological studies.

All cases were inhabitants of an endemic area for filariasis and the length of residence was more than I0 years in I35 cases (97.8%). 62 cases (44.9 %) are farmers. From those I38 cases, 88 cases are males (63.8 %).

General symptoms as fever which was reported in 20 cases (I4.5 %) , chills and sweating in 24 cases (I7.4 %), headache in 25 cases (I8.I %) and fatigue in 3I cases (22.% %) could be related to filariasis or to other parasitic infestation as bilharziasis which was detected in 43 cases (3I.2 %), ascaris in 30 cases (2I.7 %) , dysentry in 26 cases (I8.8 %) and malaria in 24 cases (I7.4 %).

The main chest symptoms included cough which was present in 32 cases (23 %), dyspnea in 23 cases (I6.6 %) and wheezing in I7 cases (I2.3 %).

The chest symptoms can be related to the associated generalised airways obstruction which presented as asthma in 7 cases (5.I9 %) and chronic bronchitis in I5 cases (I0.9 %) or to the smoking habit which was recorded in 39 cases (28.3 %).

Blood eosinophilia was reported in 44 % and sputum eosinophilia in 6I % of cases from the group examined. This is not specific for filariasis as other parasitic infestations may be the cause. In 3 patients sputum showed presence of microfilaria and this finding was observed in patients having wheezing of the chest due to generalised airways obstruction.

Ventilatory function studies showed an obstructive pattern in 26 cases (I8.8 %) , and restrictive defect in 32 cases (22.7 %) , and 5I cases (34 %) had both restrictive and obstrictive patterns.

Detailed radiological analysis of chest xrays did not show specific findings which could be definitely related to filariasis.

I5. The echocardiogram in patients with elephantiasis.

Sixteen patients with upper and / or lower limb elephantiasis were studied echocardiographically. The mitral valve closure velocity was normal in all patients and ranged between 50 to 253 mm / Sec with an average of 95 mm / Sec. One patient showed echographic evidence of prolapse of the mitral valve.

None of the patients showed evidence of pericardial effusion or right ventricular enlargement. Echocardiographic measurments of the left ventricular and systolic (LVESD) and diastolic (LVEDD) diameters were normal in I2 patients (LVES) 3 - 5.2 cm with an average of 4.2 cm and LVEDD 4 - 6.2 cm with an average of 6 cm. Four patients showed small difference between their systolic & diastolic diameters & consequently low shortening fraction (SF) indicative of impaired left ventricular functions (values for SF were 2I , 3I , 37 & 38 %).

This could be related to direct myocardial invasion by microfilaria since other causes were excluded clinically. In these four patients the ECG showed nonspecific ST change in three of them and left anterior hemiblock in the fourth patient.

Kemp (I967) reported a case in whom there was direct involvement of the myocardium and coronary vessels by filarial worms leading to heart failure.

I6. Lymphangiography in Unilateral lower limb elephantiasis.

This study showed no evidence of lymphatic obstruction in the normal limb. The thoracic duct took a normal course and caliber.

I7. Mass chest radiography in an endemic area with filariasis.

In an area endemic for filariasis, 3865 individuals chosen at random had their chest examined radiologically. The chest x-rays of 3577 cases were considered as being normal. I43 cases showed increased lung markings on their roentgenograms ; 5I of these suffer from G.O.A. diseases , 4 with bronchiectasis, 62 clinically free while the remaining 26 cases were not examined (defaulters). Increase of the heart diameter was present in 3I of the cases of which I6 had evidence of valvular lesions, 8 were clinically free and 7 cases were not examined (defaulters). Nodular shadows were detected on the roentgenograms of 36 cases , 2I of which are registered as being tuberculous and receiving treatment in chest dyspensaries ; 6 cases suggestive of being tuberculous, 5 cases refused lung biopsy to prove the diagnosis, and 4 defaulters. Prominent hilum was a finding in I3 cases, 3 of which had G.O.A.D. , 2 receiving antituberculous treatment diagnosed as primary tuberculosis, 3 were clinically free and 5 defaulters. Veiling of the base was observed in 2I of the cases, 3 of which had bronchiectasis. Ambiguous shadows registered on the chest roentgengrams of 29 cases , 6 of which proved to be tuberculous, 5 with G.O.A.D., 2 with bronchiectasis, 2 case of chronic abscess, one case died before clinical examination; in 3 cases the shadows cleared by the time they were

re-examined , 2 of which had cough and wheezing and the third was symptom free. Eleven of those with ambiguous shadows were not examined (defaulters). Cavitation was present in I5 cases , 3 of which proved to be tuberculous , 2 with chronic abscess , 3 with bronchiectasis , 4 defaulters and 3 referred for further study to chest dyspensary. None of the I3 patients who required further investigations had elephantiasis.

In summary this radiological survey did not reveal specific findings which could be definitely related to filariasis.

B) Index of progress reports abstracts issued under the contract:

I) Pulmonary manifestations of filariasis (report I), ONR, Report ACR - 219, 1976.

2) Pulmonary manifestations of filariasis (report II) ONR Report (under publication).

C) An index of all papers submitted for publications :

I. Preliminary report on incidence of microfilaraemia in filariasis carriers at Giza, A.R.E.

2. Preliminary report on filariasis survey at Manshat El Bakary, Giza.

3. Clinico-Parasitological survey of filariasis in Kafr El Ghattaty , Cairo, A.R.E.

4. The counting chamber versus thick drop method in avaluation of microfilaraemia.

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6. Bronchial challenge in patients with filariasis.

7. The diffusing capacity of the lung in filariasis.

8. Bronchofibroscopic findings in patients with filariasis.

9. Bronchopathy in filariasis.

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patients with bronchial asthma.

I3. A field trial of counting chamber technique for detection of microfilaraemia in Qaluib.

I4. The search for pulmonary manifestations in filariasis.

I5. Echocardiography in patients with elephantiasis.

I6. Lymphangiography in Unilateral lower limb elephantiasis.

I7. Mass chest radiography in an endemic area with filariasis.

D) A list of major accomplishments:-

I. Epidemiological studies of incidence of microfilaraemia in three villages nearby Cairo directed attention for the endemicity of filariasis in these regions and called for strict measures of control.

2. The pattern of symptoms and clinical manifestations of filariasis was shown.

3. The preferance of using the concentration method in detection of microfilaraemia to the traditional thick blood film method was stressed in two field studies and recommended to be adopted in Egypt in future filaria surveys.

4. Bronchopathy in filariasis, proved pathologically, was described and considered a new finding expanding medical knowledge on filariasis.

5. Pulmonary function studies in filariasis and bronchial challenge with filaria antigen suggest that generalised obstructive airway disease encountered in some patients may be due to bronchial changes other than hyperreactivity of bronchial tree.

6. Absence of lack of uniformity of ventilation and perfusion in lungs of patients with filaria as evidenced by normal diffusing capacity.

7. The sera in I6.7 % of asthmatics gave a positive indirect haemoagglutination test using filaria antigen. This forwards a supportive evidence of the relation of filariasis and bronchial asthma in tropical pulmonary eosinophilia.

8. Immunoglobulins and compliment component C_3 studies showed similar levels reported from India.

9. Bronchial mucosal biopsies studies immunohistologically showed typical IgA rich plasma cells. No filaria antigen could be detected by immunofluorescent procedures.

10. The search for clinical and radiological pulmonary manifestations of filariasis did not reveal specific findings which could be definitely related to filariasis.

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12.87% of males and 9.66% of females in the village of Manshat El Bakary were positive for microfilaraemia using the 20 mm. blood film method. By the newer concentration methods for the percentages would have been higher. Even the lower percentages indicate the endemicity of filariasis in this village. In a study to determine the clinical manifestations of filariasis, bilharziasis, ascariasis, oxysuriasis and malaria were common concurrent endemic diseases.

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20.) In the filariasis cases, 5.40% had involvement of genstalia, 4.72% had hydroceles, 4.22% had testicular enlargement and 2.48% had enlarged epididimis. Elephantiasis of lower limbs occurred in 1.15% of the cases while lymphatic edema of the lower limbs occurred in 6.84% of the cases. The prevalence of filaraemia and elephantiasis in the young age group indicates active transmission.

In a comparison of the thick smear method versus counting chamber method for detection of microfilaraemia, 3.4% of a group were found positive by the thick smear method while 22.3% were positive by the counting chamber method. The counting chamber method is easy and more accurate for the detection of microfilariae in blood, especially in patients with low microfilaraemia. This method should be adopted as the standard method in Egypt in order to determine the true distribution of the disease.

The presence of eosinophilia (400-4085/cmm) was not a good indicator of filariasis since 56.8% of the patients with microfilaraemia had eosimophilia while 36.1% of non-microfilaraemia cases also had eosimophilia.

Inhalation of filaria antigen in patients with filariasis did not reveal a significant statistical change in ventilatory function studies measured before and up to 24 hours after inhalation. This shows absence of type I hypersensitivity or type III delayed reaction following such a bronchial challenge. The cause of airway obstruction in patients with filariasis must therefore be due to bronchial changes other than hyperreactivity of the bronchial tree.