MILIARY TUBERCULOSIS ASSOCIATED WITH THE ADULT RESPIRATORY DISTRESS SYNDROME

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SYNOPSIS

The case is reported of a 31 year old woman with miliary tuberculosis who developed the adult respiratory distress syndrome. The diagnosis of tuberculosis was suspected early and appropriate therapy was given. The patient survived without respirator support.

INTRODUCTION

Miliary tuberculosis is a rare cause of acute respiratory failure. Murray et al (1978) recently reported three cases of the adult respiratory distress syndrome associated with miliary tuberculosis and in their review of the literature could find only six other cases of this association. (Goldfine et al., 1969; Homan et al., 1975; Huseby and Hudson, 1976; DeSilva et al., 1977). We report here another case who survived without respirator support.

CASE REPORT

A 31-year-old Chinese woman was hospitalized in September 1976 because of cough, fever and chills following the delivery of a premature baby ten days before her admission Except for cough associated with slight breathlessness on exertion for three weeks prior to her delivery, she had been well and had no exposure to tuberculosis.

Examination revealed an anxious woman in moderate respiratory distress with a temperature of 39.5 deg. C, pulse rate of 120 beats per minute, and respiratory rate of 28 per minute. Her blood pressure was 120/80 mmHg. Abnormal physical findings were bilateral basal crepitations, a slightly enlarged liver and an enlarged involuting uterus. Laboratory investigations showed the following results: Hemoglobin 10 gms. per cent; white cell count 7900/cu.mm. (98 per cent polymorphonuclear leucocytes and 2 per cent lymphocytes); platelet count 200000/cu.mm. Sputum smears were negative for tubercle

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bacilli and sputum culture grew Achromobacter sp. sensitive to ampicillin. Urinalysis was normal as were the blood urea, serum electrolytes, and serum glutamic pyruvic transaminase. An electrocardiogram was normal and the Mantoux test to 1 TU PPD was non reactive. Blood culture was sterile and blood for lupus erythematosus cells and antinuclear factor antibodies were negative. I umbar puncture revealed a normal cerebro-spinal fluid. Arterial blood gas levels with the patient breathing room air were as follows: pH 7.41, pCO2 34 mmHg, Standard bicarbonate 22.5 mMol/L and pO^2 53 mmHg. The chest radiograph showed diffuse reticulonodular opacities over both mid and lower zones bilaterally. (Fig. 1)

Initial therapy included intramuscular ampicillin and interanasal oxygen. She continued to have a swinging fever and bilateral basal crepitations.

On the sixth day, because of suspicion of miliary tuberculosis, she was started on daily streptomycin, isoniazid and ethambutol. The ampicillin therapy was stopped. Her fever promptly settled the next day. A chest radiograph revealed an increase in the reticulonodular opacities with spread to involve the apices. (Fig. 2) She remained afebrile the following day but suddenly became cyanosed and more dyspnoeic. The arterial blood gas levels with the patient on intranasal oxygen at 4 L/min. showed pH 7.40, pCO_2 36 mmHg, standard bicarbonate 22.8

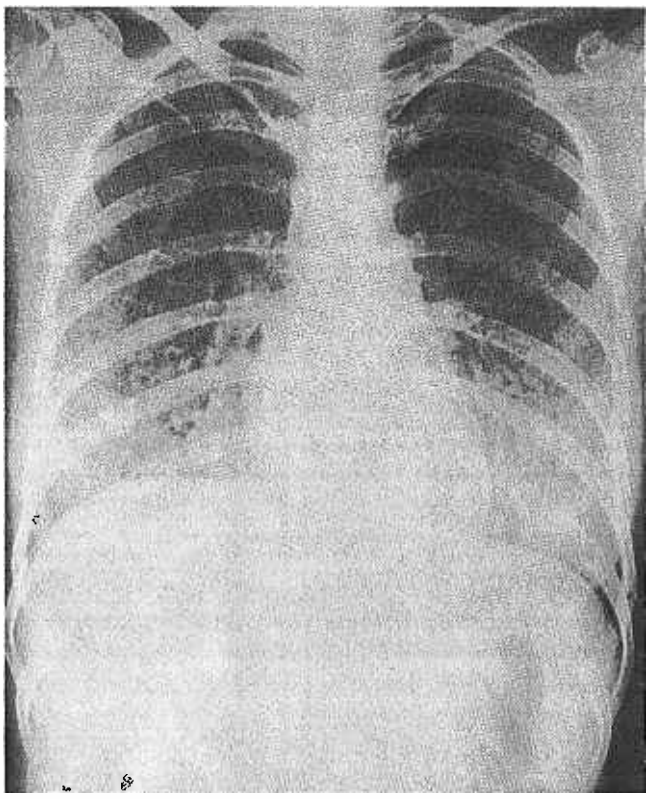

Fig. 1 Chest radiograph on admission showing diffuse reticulonodular opacities in mid and lower zones bilaterally.

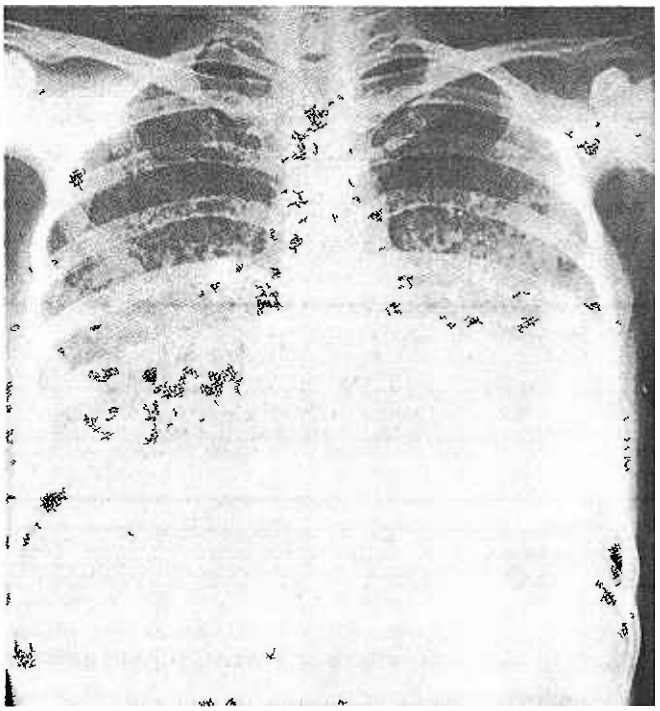

Fig. 2 Chest radiograph, six days after admission, showing an increase in the opacities with spread to involve the apices.

mMol/L and pO_2 56 mmHg. The chest radiograph revealed confluence of the opacities. (Fig. 3) Prednisolone 40 mg. daily was started. Her condition improved gradually; a chest radiograph five weeks later showed complete resolution of the opacities. Cultures of the sputum and cerebro-spinal fluid obtained on admission failed to grow M. tuberculosis. Her three-month-old baby was found to be suffering from congenital tuberculosis (cervical lumph node biopsy revealed caseating granulomas with acid fast bacilli). Currently both mother and child are on antituberculosis chemotherapy and are well.

DISCUSSION

The clinical presentation of miliary tuberculosis in adults has been well documented and reviewed (Biehl, 1958; Proudfoot et al., 1969; Munt, 1972; Gelb et al., 1973). As a cause of acute respiratory failure, however, it is rare, although some impairment of gas exchange have been reported (Williams et al., 1973). In their review of the adult respiratory distress syndrome associated with miliary tuberculosis, Murray et al (1978) noted that five of the nine cases were alcoholics. This factor could have accounted for the acute catastrophic pulmonary failure. It is likely that the rapid deterioration of our patient, a teetotaller, could be attributed to her postpartum state, as it is relatively common for young mothers to develop severe tuberculosis after paturition (Crofton and

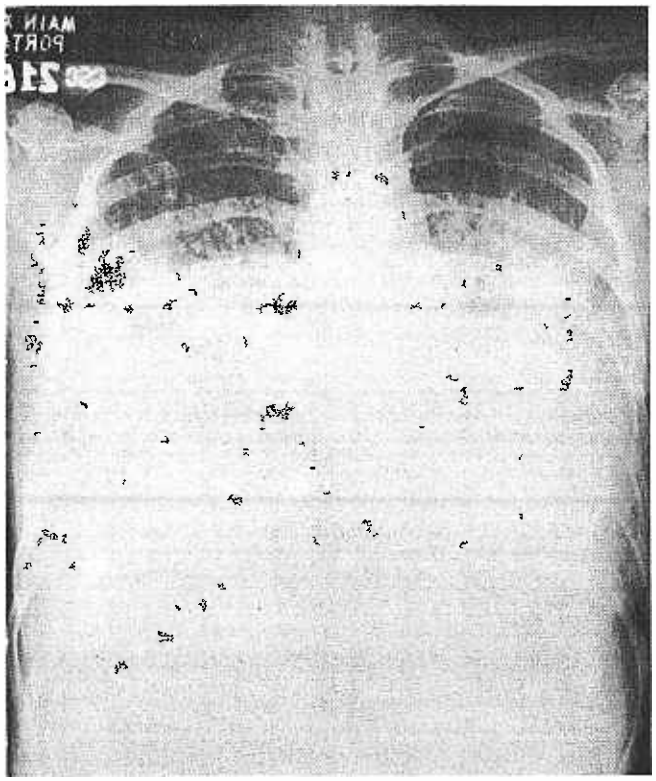

Fig. 3 Chest radiograph, one day later, showing confluence of the opacities.

Douglas, 1975).

While the principles and techniques in the management of patients with the adult respiratory distress syndrome are well established (Petty and Ashburgh, 1971), rarely is there a specific therapy for the underlying cause. Our patient's prompt response to treatment indicate the value of specific anti-tuberculosis chemotherapy and corticosteroids which have been shown to reduce systemic toxicity and enhance radiological resolution in patients treated for pulmonary tuberculosis. Disseminated intravascular coagulation, a feature noted in eight of the nine previously reported cases, was not present in our patient, and this could have contributed to her successful outcome.

The basic pathological process in the adult respiratory distress syndrome is diffuse injury to the capillary endothelium that causes increased permeability and pulmonary oedema (Murray, 1975). Huseby and Hudson (1976) postulate this increased permeability in miliary tuberculosis associated with the adult respiratory distress syndrome to be due to capillary endothelial damage as a result of massive release of tubercle bacilli into the circulation, or embolisation of platelet fibrin aggregates or a cell mediated hypersensitivity reaction.

Since sputum smears for tubercle bacilli are positive in less than 40 per cent of cases of miliary tuberculosis and the tuberculin test is frequently non-reactive in these patients (Biehl, 1958; Proudfoot et al., 1969; Munt, 1972 Gelb et al., 1973), the diagnosis will have to be based initially on the history and radiological picture. A high index of suspicion is necessary and we would support the opinion of Murray et al. (1978) that "when faced with similar patients with the adult respiratory distress syndrome who have no immediately apparent, common precipitating cause (e.g. diffuse viral or bacterial infections, shock, trauma, etc.) strong consideration should be given to beginning empiric anti-tuberculosis therapy, pending the results of repeated tracheobronchial smears, biopsies of bone marrow, and, possibly, hepatic and transbronchial pulmonary biopsies".

REFERENCES

1. Biehl, J.P.: Miliary Tuberculosis. A review of 68 adult patients admitted to a municipal general hospital. American Review of Tuberculosis and Pulmonary Diseases, 77, 605, 1958.
2. Crofton, J. and Douglas, A.: Respiratory Diseases 2nd Edition. 1975. Blackwell Scientific Publications.
3. DeSilva, A., Gibson, J and Gilbert, D.N.: Miliary tuberculosis and adult respiratory distress syndrome. Annals of Internal Medicine, 86, 659, 1977.
4. Gelb, A.F., Leffler, C., Brewin, A., Mascatello, V. and Lyons, H.A.: Miliary tuberculosis. American Review of Respiratory Disease, 108, 1327, 1973.
5. Goldfine, I.D., Schachter, H., Barclay, W.R. and Kingdon, H.S.: Consumption coagulopathy in miliary tuberculosis. Annals of Internal Medicine, 71, 775, 1969.
6. Homan, W., Harman, E., Braun, M.M.T., Felton, C.P., King, T.K.C. and Smith, J.P.: Miliary tuberculosis presenting as acute respiratory failure: treatment by membrane oxygenator and ventricle pump. Chest, 67, 366, 1975.
7. Huseby, J.S. and Hudson, L.D.: Miliary tuberculosis and adult respiratory distress syndrome. Annals of Internal Medicine, 85, 609, 1976.
8. Munt, P.W.: Miliary tuberculosis in the chemotherapy era. with a clinical review in 69 American patients. Medicine, 51, 139, 1972.
9. Murray, J.F.: The adult respiratory distress syndrome (May it rest in peace). American Review of Respiratory Disease, 111, 716, 1975.
10. Murray, H.W., Tuazon, C.U., Kirmani, N. and Sheagren, J.N.: The adult respiratory distress syndrome associated with miliary tuberculosis. Chest, 73, 37, 1978.
11. Petty, T.L. and Ashburgh, D.G: The adult respiratory distress syndrome: clinical features, factors influencing prognosis and principles of management. Chest, 60, 233, 1971.
12. Proudfoot, A.T., Asktar, A.J., Douglas, A.C. and Horne, N.W.: Miliary tuberculosis in adults. British Medical Journal, 2, 273, 1969.
13. Williams, M.H., Yoo, O.H. and Kane, C.: Pulmonary function in miliary tuberculosis. American Review of Respiratory Disease, 107, 858, 1973.