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Case Report

Corticosteroid responsive pulmonary hypertension in systemic lupus erythematosus

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SUMMARY Primary pulmonary hypertension is an irreversible and fatal disorder. Every effort should therefore be made to discover all the other treatable diseases which may be associated with pulmonary hypertension. The association of systemic lupus erythematosus and pulmonary hypertension was rarely reported in the past. We add another case in which pulmonary hypertension was the presenting symptom of systemic lupus erythematosus (SLE). In contrast to the previously reported cases, our patient responded well to corticosteroids. It is assumed that this favorable response was due to the relatively early stage of the disease, when the histopathologic pulmonary changes were still in the reversible inflammatory stage.

Key words: SLE, Pulmonary Hypertension, Corticosteroids.

INTRODUCTION

Pulmonary hypertension (PH) is defined as an abnormal increase in the mean pulmonary artery pressure. It refers to an aggregate of disorders which have a uniform clinical picture, although the pathogenetic mechanisms may be quite different. The patient described in this report suffered from pulmonary hypertension which was the presenting symptom of systemic lupus erythematosus (SLE).

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CASE REPORT

A 49-year old female patient was hospitalized for evaluation of exertional dyspnea and retrosternal pain. She had been suffering for a few years from polyarthralgia which was treated irregularly with non steroidal anti-inflammatory drugs. She noted an increased loss of hair and mild alopecia.

When admitted on July 1981, she complained of shortness of breath and retrosternal pain, which started a few months earlier. Physical examination revealed blood

pressure of 110/80 mmHg, inspiratory decrease of 20 mmHg (paradoxic pulse), regular pulse 88/min. Fine maculopapular rash was observed over the exposed areas of the skin. Small, mobile and nontender lymph nodes were palpated on both sides of the neck, the axillae and the left groin. The jugular veins were mildly congested. The lung fields were clear. A 3/6 systolic murmur was heard at the left sternal border and the pulmonic area, as well as an inspiratory splitting of S_2. The liver was tender and had a span of 20 cm. There was a 1 + pitting edema of the ankles.

The electrocardiogram demonstrated sinus rhythm, incomplete right bundle branch block, RS in V_1, and inverted T waves in V_{1-4}. Chest X-ray showed cardiomegaly, prominent main pulmonary arteries and a small right pleural effusion.

The relevant laboratory tests were: Hb 10.5 gr/dl, MCV 79 μ^3, MCH 24 $\mu\mu$g, WBC 8500/cmm with a normal differential count, reticulocytes 3 % - 5 %, platelets 215000/cmm, erythrocyte sedimentation rate (Westergren) 21 mm/1 hour. Total proteins 8 gr/dl, globulin 4.2 gr/dl, in immunoelectrophoress: IgG 3000 mg/dl, IgM 235 mg/dl, IgA 170 mg/dl. The antinuclear factor (ANF) was strongly positive, LE cells were not found, Latex fixation test 1 : 160, C_4 10 mg/dl ($20 < N < 63$), C_3 100 mg/dl ($104 < N < 174$). Ahaptoglobulinemia was detected. Renal and liver function tests, muscle enzymes and urinalysis were within the normal limits.

Lung scan was normal. Pulmonary functions revealed a mild obstructive disturbance: Vital capacity (VC) = 2620 ml (85 % of predicted), residual volume (RV) = 1720 ml (145 % of predicted), forced vital capacity (FVC) = 2620 ml (85 % of predicted), forced expiratory vol. in 1 second (FEV_1) = 2050 ml (85 % of predicted), V_{50} = 2.25 ml/sec, V_{25} = 0.6 ml/sec. The arterial $p0_2$ 96 mmHg, pCO_2 33 mmHg, $Hb0_2$ 97 %, Bicarbonate 21 mEq/l. Pleural tap yielded a sterile exudate which reacted strongly to ANF. An echocardiogram confirmed the diagnosis of pericardial effusion. Valvular disease was not demonstrated. Computed tomography of the chest revealed pericardial and bilateral pleural effusions and thickening of the pericard.

Faced with a patient presenting right heart failure, the following possible etiologies were considered: Mitral stenosis, recurrent pulmonary embolism and constrictive pericarditis. In order to reach a definite diagnosis, right-sided cardiac catheterization was performed (Table 1).
Severe pulmonary hypertension with normal mean capillary wedge pressure were found. No shunt was detected; there was no step-up in 0_2 saturation at the level of the vena cava, rt. atrium, rt. ventricle or pulmonary artery. Pulmonary venous hypertension was ruled out by the presence of normal pulmonary capillary wedge pressure.

In retrospect, it was realized that the pulmonary hypertension, polyarthralgia, pericardial and pleural effusions, photosensitivity of the skin, hemolytic anemia, alopecia, hypergammaglobulinemia,
lymphadenopathy and positive ANF, were all signs of one disease--systemic lupus erythematosus. Assuming that pulmonary hypertension was due to vasculitis, flucortolone 60 mg/day was administered. The patient's condition improved gradually and she was discharges six weeks after her admission.

On November 1981, the patient was admitted for reevaluation of her cardiopulmonary status. She was feeling well and did not complain of dyspnea. Physical examination did not reveal any signs of heart failure. Chest radiogram was normal. A small amount of pericardial fluid was still observed in the echocardiogram. Repeat right-sided cardiac catheterization demonstrated a significant fall in the pulmonary artery pressure (Table 1).

In view of the clinical improvement, flucortolone was continued, on an alternate day regime of 20 mg/48 hours, Now, as of

Table 1: Comparison of the catherization performed before the start of flucortolone and 2 months later

	Richt Atrial Pressure	Richt Ventricular Pressure	Pulmonary Artery Pressure	Mean Capillary Wedge Pressure	C.O.[1] lit/min	SVR[2]	PAR[3]	TPR[4]
1st catherization (before treatment)	7*	80/0–7*	100/40*	10*	5	1328**	800**	960**
2nd catherizarion (under flucortolone)	3*	50/0–8*	60/30*	15*	5.4	1333**	370**	592**

1 — C.O. = Cardiac Output (L/min)
2 — SVR = Systemic Vascular Resistance
3 — PAR = Pulmonary Arteriolar Resistance
4 — TPR = Total Pulmonary Resistance
* Pressure expressed in mmHg
** Vascular Resistance expressed in dynes/sec/cm^{-5}

March 1982, the patient feels well and leads a normal life.

DISCUSSION

The typical sign of pulmonary hypertension (PH) are progressive intolerance of exercise, easy fatigability, undue breathlessness, retrosternal pain and syncope (1). Various physiological conditions may be associated with pulmonary hypertension (1): A. Increased pulmonary blood flow (left to right cardiac or intrapulmonary shunts), B. Increased pulmonary venous pressure (mitral stenosis, pulmonary veno-occlusive disease); C. Increased pulmonary vascular resistance (chronic obstructive lung disease, pulmonary embolism, collagen diseases); D. Miscellaneous causes (post irradiation, exogenic toxic agents, e.g., Aminorex). The primary (idiopathic) form of the disease, which is not common, runs a progressive and usually fatal course (2). Mainly affected are young females, between the ages of 20 and 40. The disease process involves the small pulmonary arteries which exhibit muscular hypertrophy and intimal hyperplasia (1). Unfortunately, it is difficult to detect PH at the early stages, when it is usually asymptomatic. Thus, the typical findings appear only in later stages.

Treatment of primary pulmonary hypertension, which has been aimed at the possible etiologies of the disease, is still unsatisfactory (3,4). Presumptive hypoxia of the lungs led to the traditional long-term oxygen therapy, which may sometimes lower the pulmonary artery pressure. Antiaggregants and anti-coagulants have been employed in order to conform with the theory of organizing intrapulmonary microemboli. The association of pulmonary hypertension with Raynaud's phenomenon pointed to a possibility of pulmonary arterial vascoconstriction as the underlying factor. This led to the extensive trials of various vasodilators (5-9) (isuprel, prazocin, diazoxide, hydralazine, nifedipine and prostacyclin (PGI_2). Corticosteroids and cytotoxic drugs (azathioprine, cyclophosphamide) have been used when pulmonary hypertension was associated with collagen diseases.

Primary pulmonary hypertension, should not be diagnosed until all the other etiologies are definitely ruled out. Our patient could have been wrongly diagnosed as primary pulmonary hypertension, but the combination of polyarthralgia, pleural and peri-

cardial effusions, photosensitivity of the skin, hemolytic anemia, alopecia, lymphadenopathy and positive ANF led to the diagnosis of systemic lupus erythematosus.

Lung involvement in systemic lupus erytgematosus is common. Pleurisy, interstitial pneumonitis and fibrosis, atelectasis, pulmonary hemorrhage and recurrent bronchopneumonia are some of the known pulmonary features of systemic lupus erythematosus (10). However, pulmonary hypertension secondary to systemic lupus erythematosus has seldom been reported (11-14). In most of the cases, corticosteroids did not change the patient's condition and did not stop the continuous deterioration of the disease. There were only few reports of favourable results (14). Histologic examination of pulmonary vasculature in systemic lupus erythematosus suggested that there is an early inflammatory stage which is expressed as vasculitis (15). Subsequently, this changes into permanent and irreversible fibrosis. Corticosteroids may therefore have a beneficial effect on the inflammatory phase. We may therefore assume that the good therapeutic response of our patient points to the possibility that her disease was still in the inflammatory stage.

Through this case we wish to emphasize the following points: that pulmonary hypertension can be the presenting sign of systemic lupus erythematosus and that a therapeutic trial of corticosteroids should always be considered.

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