RADIOGRAPHIC FINDINGS IN 35 CASES OF PULMONARY INFECTION CAUSED BY RHODOCOCCUS EQUI[3]

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ABSTRACT

Rhodococcus equi(Corynebacterium equi) is able to produce infections not only in animals but also in human being usually in immunosuppressed one. We report 35 cases of pulmonary infection with this organism mainly in patients infected with the human immunodeficiency virus (HIV) and this is the biggest series ever reported.

The most common pulmonary manifestations including area of opacity with cavity 48.72%, area of opacity without cavity 28.21%, other findings were mass with or without cavity, nodule and interstitial infiltration. The lesions involved the lower lobe in 55.26% while the upper lobe involvement was 42.11%. Multiple sites of involvement was noted in 11.43%. Pleural effusion encountered in 22.86%. Pericardial effusion and endobronchial lesion were noted in one and two cases respectively.

The course of the disease usually subacute with symptoms of fever, cough, chest pain and hemoptysis of various duration from 1 to12 weeks.

Rhodococcus equi infection should always be considered in the differential diagnosis of a HIV infected patient with cavitary pneumonia.

Key words: Rhodococcus equi, pulmonary infection, HIV

INTRODUCTION

Rhodococcus equi is a known cause of pulmonary infection in foals, calves and swines. It was orginally isolated as Corynebacterium equi in 1923 from foals with pneumonia and has been reclassified in the genus Rhodococcus since 1980. Microscopically,it is an aerobic,gram positive, weakly acid fast,non motile, non spore forming, pleomorphic coccobacillus. Rhodococcus equi is named for its production of red pigment.[1]

Rhodococcus equi has been a rare cause of disease in human. Golub et al[2] reported the first human case caused by this organism in 1967, but after exploding of the HIV infection, there is rising in number of disease caused by R.equi. We report the radiographic features of 35 cases of pulmonary R.equi infection.

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MATERIALS AND METHODS

35 cases diagnosed at Chiang Mai University Hospital as pulmonary infection caused by R.equi during the period of April 1993 through September 1996 were reviewed for the radiographic findings. All had culture identification of R.equi from either sputum, blood, bronchial washing, pleural fluid or direct tissue tapping. Patients with concurrent pulmonary infection caused by other organisms were excluded.

RESULT

All 35 patients were immunocompromised hosts,33 were infected with HIV, one was a case of SLE on steriod treatment, another one was a late case of Hodgkin's disease. There were all male except one SLE patient. The age ranged from 20 to 69 years with the median age of 44 years. The cultures were taken from many sources,most were from sputum (80%), while others were from blood (28.6%), bronchial washing (8.6%) pleural fluid (5.7%) and direct tissue tapping (2.8%). Multiple sources were obtained in 22.85%. The common presenting symptoms were cough (90%) and fever (80%) followed by chest pain (53%) and hemoptysis (25%). The duration of symptoms range from 1 to 12 weeks.

The initial chest film findings of 39 lesions in 35 patients (table 1) were area of opacity with cavity (fig.1) 19 lesions (48.72%), area of opacity without cavity (fig.2) 11 lesions (28.21%), mass with cavity (fig.3) 5 lesions (12.82%), mass without cavity (fig.4) 2 lesions (5.13%), nodule 1 lesion (2.56%) and interstitial infiltration (fig.5) 1 lesion (2.56%).

Of 38 lesions, excluding the interstitial one, there were 18 lesions in the right lung (6 RUL,1 RML,11 RLL) and 20 lesions in the left lung (7 LUL,3 lingular,10 LLL). Bilateral simul-taneous lesions were found in 4 patients.

The associated findings were pleural effusion, 6 patients were found unilaterally (2Rt ,4 Lt) and bilaterally in 2 patients. Pericardial effusion and endobronchial lesion were noted in 1 and 2 patients respectively.

Follow up chest film were able to obtain in 24 patients ranged from few days to 6 months time and found rapid progression (change in days to weeks) 10 patients (42%),slow progression (change in months) 7 patients, no change 2 patients and improvement 5 patients which 4 patients had cystic change (fig.6).

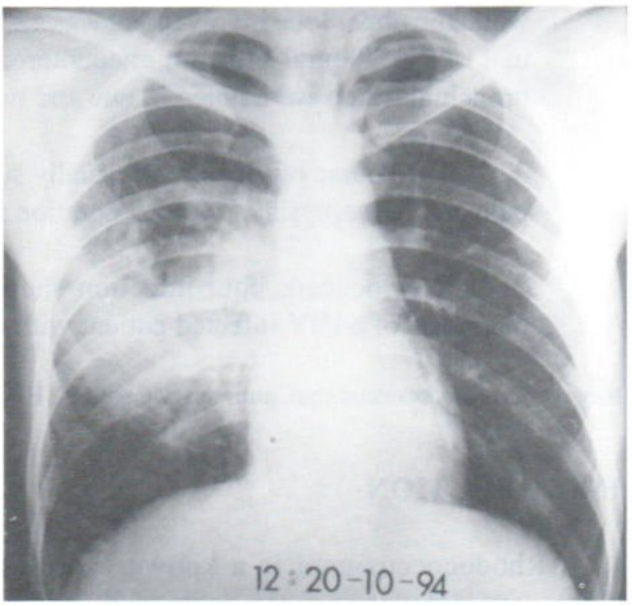

Fig 1: Chest film showing an area of opacity with cavity in the right lower lobe.

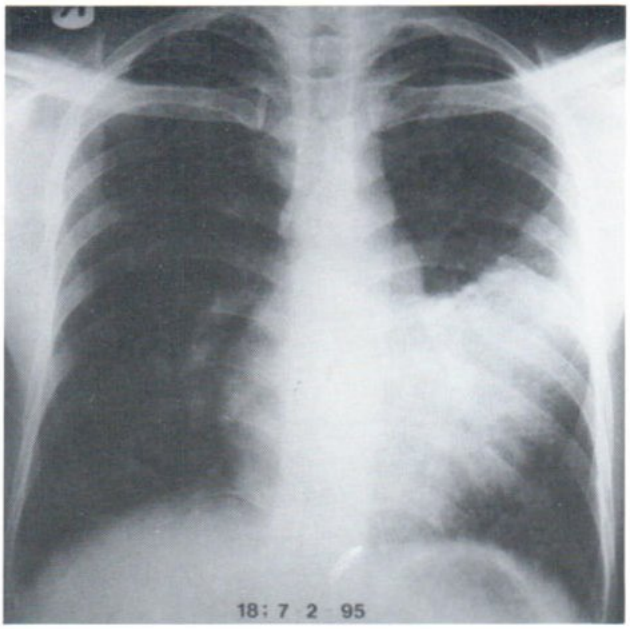

Fig 2: Chest film showing an area of opacity in lingular segment of the left upper lobe.

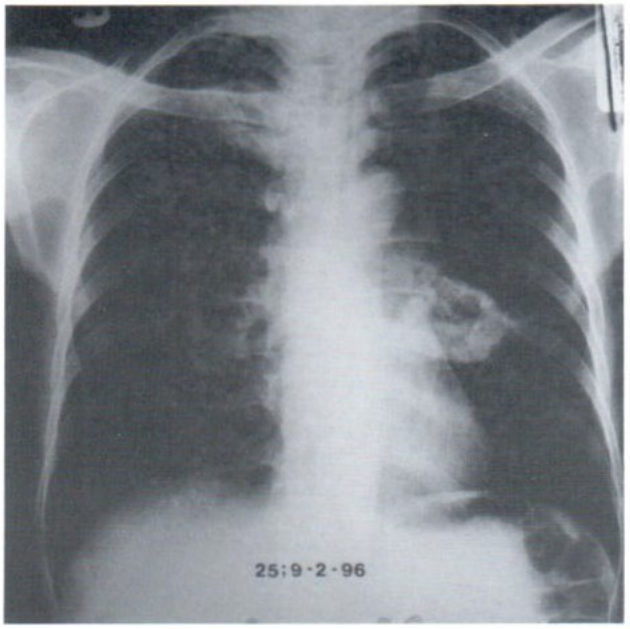

Fig 3: Single cavitary mass was noted in the left lower lobe.

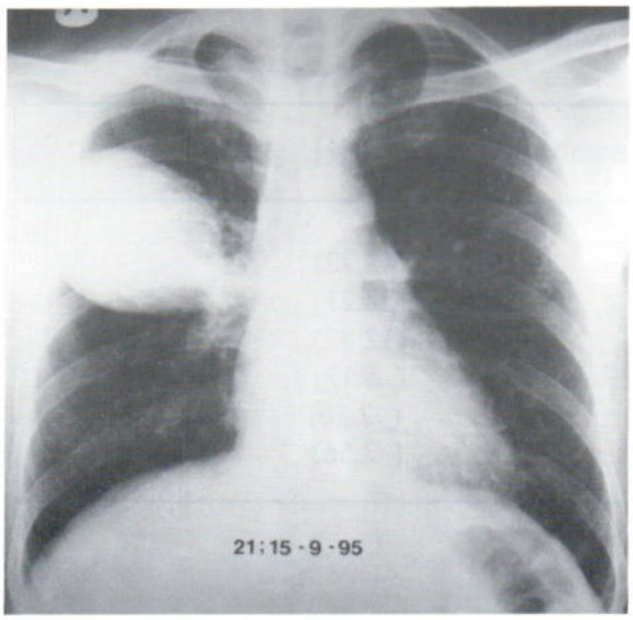

Fig 4: A big homogenous mass was noted in the right upper lobe.

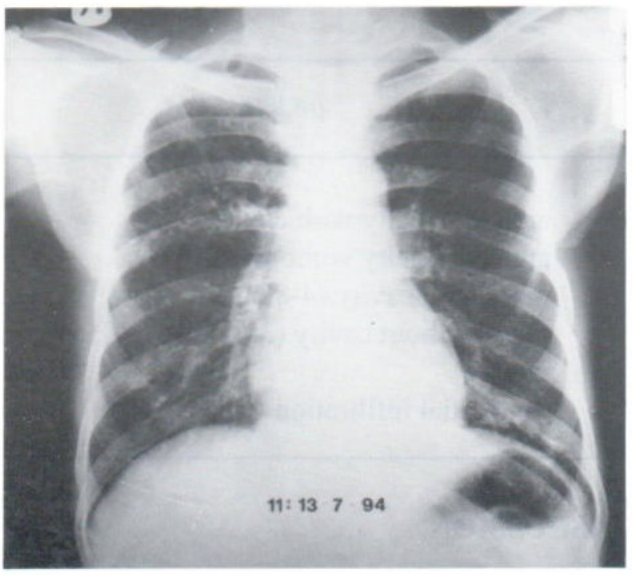

Fig 5: Chest film showing bilateral interstitial infiltration.

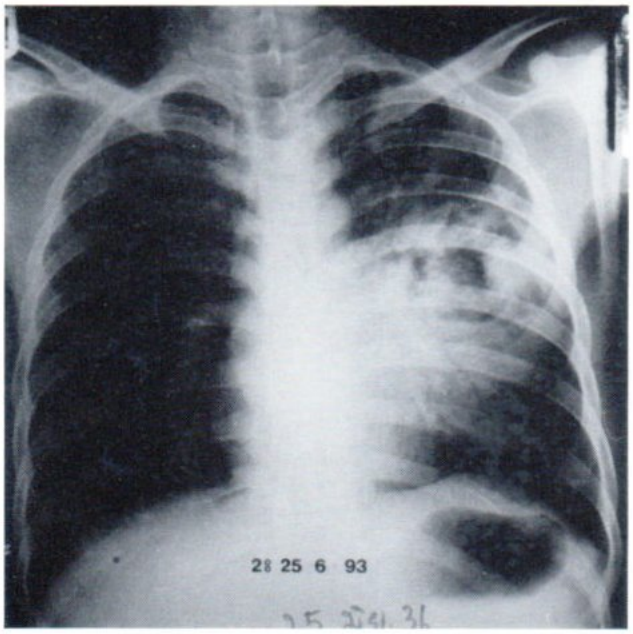

Fig 6a: The initial chest film showed an area of opacity with cavity in the left upper lobe.

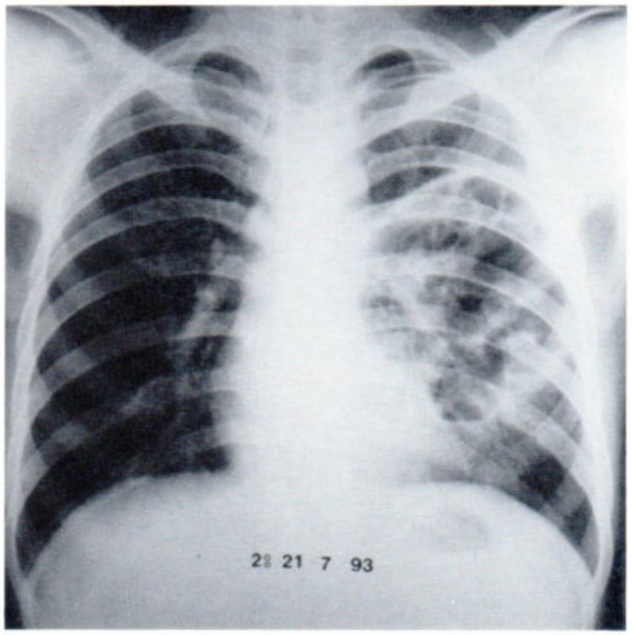

Fig 6b: The follow up film demonstrated multiple thin wall cystic replacement.

Table 1: Initial chest film findings in 39 lesions(35 patients)

pattern	number of lesion(s) [%]	
area of opacity with cavity	19	(48.72)
area of opacity without cavity	11	(28.21)
mass with cavity (4-8 cm)	5	(12.82)
mass without cavity (3-8 cm)	2	(5.13)
nodule	1	(2.56)
interstitial infiltration	1	(2.56)

DISCUSSION

Pulmonary infection is the most common form of human disease caused by Rhodococcus equi.[1] Extrapulmonary infections are rare and have been reported in central nervous system, skin, lymph nodes, bone, soft tissue and liver.[1,3,4,5] Most of the infected patients are immunocompromised host particularly in HIV infected patients,others include leukemia, lymphoma and renal transplantation.[3,6,7,8]

The typical presenting symptoms are cough,high fever, prominent fatigue, weight loss, chest pain and usually with subacute onset. Hemoptysis can also be occured.[1]

The most common radiographic finding in our study is the area of opacity with cavity which comprises about 48.72% and corresponding well to the other series that cavitary pneumonia is the most common pattern.[6,9-17] There is no predilection for the site of the lung lesion and pleural effusion is found mainly associated with the lower lobe lesion on the same side. No mediastinal lymphadenopathy is present in our series.

Rhodococcus equi is a gram positive facultative intracellular bacterium and its ability to persist in and eventually to destroy the macrophage is the basis of its pathogenicity. Clearing of this organism from lung requires functional CD4+Tcell, hence the HIV infected individual is prone to have increase incidence of severe Rhodococcus equi pneumonia.[1,18,19] Failure to clear pulmonary R.equi infection leads to development of granuloma and progressive loss of lung parenchyma to necrotizing cavitated lung.[1,19] Radiographic pictures then are shown as area of opacity or lung mass with cavity. 42% of our study had rapid progression which somehow might reflect the host immune status.

Pathologic change elicited by R.equi resembles that of other members of the Corynebacterium, Mycobacterium and Nocardia group which share lipid-rich cell wall component.[1] Thus differential diagnosis from radiographic view point should include pulmonary tuberculosis, nocardia and fungal infection.

Management requires a prolong course of antibiotics for a minimum of 2 months due to frequency of relapse following shorter courses.[1] Many reports stated its susceptibility to erythromycin, rifampin, ciprofloxacin, aminoglycosides and glycopeptides.[1,3,18,20] The most commonly used antibiotic regimen was the combination of erythromycin and rifampin.[20]

CONCLUSION

Opacity or mass with cavity is the most common radiographic feature of pulmonary R.equi infection. The associated finding of pleural effusion is mainly occurs in the ipsilateral lower lobe lesion.

We propose that in the HIV infected patient who present with a cavitary pneumonia of subacute onset, Rhodococcus equi pneumonia should be of consideration in addition to nocardia, mycobacterium and fungal infection.

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