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CASE REPORT ON SILICOSIS

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ABSTRACT

Silicosis, a type of pneumoconiosis, is an occupational lung disease caused by inhaling large amounts of crystalline silica dust, usually for a long period of time. In India, more than 10 million workers are at risk of silicosis and considered as a major occupational health problem in India. It mainly affects people who are in mining, glass manufacturing, foundry works, Construction work, Tunnel works etc. It is characterized by inflammation and scarring in the form of nodular lesions in the lungs. Silicosis may be complicated with lung diseases including lung cancer and autoimmune diseases. Other pulmonary complications include chronic bronchitis, non-tuberculous mycobacterium infection, fungal infection, emphysema and pneumothorax. The diagnosis of silicosis includes chest x-ray, breathing tests, high resolution CT scan of the chest, bronchoscopy, biopsy of the lungs and additional tests, such as mucus (sputum) evaluation, to assess for associated diseases, such as tuberculosis (TB). Patients with silicosis are more susceptible to pulmonary tuberculosis known as "silicotuberculosis" the reason may be due to silica damages the macrophages causing inhibition of their ability to kill mycobacterium. There is no specific treatment given for silicosis patients. Avoiding further silica exposure is important to prevent the disease from getting worse. Supportive treatment includes cough medicine, bronchodilators, and oxygen if needed. Antibiotics are prescribed for respiratory infections as needed.

KEYWORDS: Silicosis, Occupational Disease, Construction Workers, Silicotuberculosis.

INTRODUCTION

Silica is an odourless, non-irritant substance that present in soil, sand, granite, and many other minerals. Inhalation of this silica dust may lead to many diseases and are responsible for high mortality and morbidity in industrial workers.[1] It does not cause any immediate health effects, but prolonged exposure of crystalline silica-containing dust is associated with pneumoconiosis, tuberculosis, nocardiosis, cancer, progressive sclerosis, disease, possibly rheumatoid arthritis and other lung diseases and airways diseases. Silicosis is a lung disease caused by inhalation of crystalline silica dust and is marked by inflammation and scarring in the form of nodular lesions in the upper lobes of the lungs. People with increased risk to silica dust exposure are miners, sandblasters, tunnel drillers, stone sculptors, ceramic workers etc.[3] Silicosis is characterized by dyspnea, cough, fatigue, tachypnea, loss of appetite, weight loss, chest pain, fever, gradual darkening of skin (blue skin). In advanced cases, cyanosis, pallor or Respiratory insufficiency.[2]

CASE REPORT

A 55 year old male patient admitted in general medicine department with complaints of cough with expectoration (on & off) for 2 months; sputum is whitish colour, non foul smelling and not blood stained. Also complaints of breathlessness which is aggravated during sleep and relived by taking medications and patient has no complaints of fever, loss of appetite and abdominal pain. Past medical history includes patient experience similar illness before 10 years and treated. He is also having bronchial asthma and hypertension for 2 months not under regular treatment. He is alcoholic before 5years and now he stopped. Sputum examinations showed absence of acid fast bacilli (AFB). His chest x-ray shows left mid and lower zone pneumonitis. High-resolution computed tomography (HRCT) shows features suggestive of silicosis and ECG shows tall T wave in interior leads. The patient is on symptomatic management and has not aggravated the condition until the last follow-up.

DISCUSSION

Silicosis is developed when tiny particles of crystalline silica dust are inhaled. Silica dust of size 0.5 to 5 µm cause pathological changes in lungs. The inhaled free silica dust will lodged in alveoli of lungs and engulfed by macrophages which may produce inflammatory response by releasing tumor necrosis factors, interleukin-1, leukotriene B4 and other cytokines. This

stimulates fibroblasts to proliferate and produce collagen around the silica particle, thus results in fibrosis and nodular lesions.[3,4]

Chronic exposure to silica will increases the risk of tuberculosis infection and exacerbates pre-existing pulmonary tuberculosis. Silicosis patients are particularly susceptible to tuberculosis infection (silicotuberculosis).[5] Differential diagnosis is challenge. Silicotuberculosis patients may undiagnose because symptoms such as cough, wheeze, expectoration, dyspnoea and chest pains are common to silicosis also. Interpretation of the chest X-ray film of patients with silicosis is difficult due to the superimposition of silicotic nodules and tuberculous infiltration. It is anticipated that silica particles restrain the ability to kill mycobacteria by damaging the pulmonary macrophages.[1] In order to identify silicotuberculosis, it is recommended that sputum smear microscopy and sputum culture be performed, as well as chest X-ray. In some cases, Mycobacterium tuberculosis bacilli may not be recovered from the sputum because silicotic fibrosis prevents the discharge of tubercle bacilli into the sputum.[6] If there are still doubts about the presence of active tuberculosis, bronchoscopy with BAL can be used, in conjunction with transbronchial biopsy when possible.[7,8]

There is no specific treatment for silicosis. Symptomatic treatments are mostly given to the patients. Avoidance of further exposure is the first step in treatment.[9,10] Antibiotics can be given for bacterial lung infection. Tuberculosis (TB) prophylaxis can be given to those with positive test and prolonged anti-tuberculosis drugs (multi-drug regimen) for those with active TB. Chest physiotherapy is used to drain the bronchial mucus. Oxygen administration to treat breathlessness. Bronchodilators are used for relaxation of bronchial muscles to facilitate breathing. Lung transplantation, to replace the damaged lung tissue, is the most effective treatment, but is associated with severe risks (e.g., opportunistic infections). Corticosteroid therapies, inhalational Aluminium, D-penicillamine are some of the experimental treatment.[8,11,12]

CONCLUSION

Silicosis is a common occupational disease which can be cause problems even after cessation of exposure. There is no cure for silicosis. Prevention is the best way to avoid the disease. Awareness programs should be conducted to educate workers and should provide informative leaflets printed in local language. A periodic health check up should be done in order to identify it earlier. Those who are at risk of silicosis should be at use of protective masks and

monitor chest radiography at regular intervals. The workers should be aware of the symptoms and protected from further exposure to prevent further complications.

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