DOI: 10.5958/2319-5886.2014.00429.9

International Journal of Medical Research & Health Sciences

www.ijmrhs.com Volume 3 Issue 3 Coden: IJMRHS Copyright @2014 ISSN: 2319-5886

Received: 11th Apr 2014 Revised: 20th May 2014 Accepted: 26th May 2014

Case report

A RARE CASE OF OCCUPATIONAL LUNG DISEASE – TALCOSIS

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ABSTRACT

Talcosis/ Talcpneumoconiosis is one of the rarer forms of magnesium silicate induced lung disease, It usually occurs in the fourth decade and affects people working in talc related industries like roof, shingle, pharmaceutical companies, talcum powder industries, electric ceramics, rubber industry etc. We report a case of talc pneumoconiosis/talcosis in a 51yr old male who presented with breathlessness and dry cough for the past 5 yrs and progressively worsening for the past 5 days. Who was working in a talcum powder manufacturing company for >28yrs in the packaging section. The diagnosis was possible by history, clinical examination, Chest X-ray, PFT/DLCO, HRCT chest, Bronchoscopy & Trans bronchial lung biopsy showing interstitial fibrosis.

Keywords: Talcosis, Pneumoconiosis, Interstitial fibrosis

INTRODUCTION

Talcpneumoconiosis is one of the rarer forms of occupational lung diseases. The International Labour Organization has defined pneumoconiosis as the accumulation of mineral dust in the lungs and the tissue reaction to its presence.[1]Themost common occupational lung diseases in India are silicosis, asbestosis, by sinosis, bagassosis and coal worker pneumoconiosis.[2]

In 1896 Thorel reported the first case of talcosis.[3]Talc is a hydrated magnesium silicate. Talcosis is one of the rarer forms of silicate induced lung diseases most commonly in the fourth decade in persons working in industries like roof industry, shingle industry, asphalting industry, cosmetics, toilets, electric ceramics, tiles, rubber industry, accumulator plates, leather finishing, fertilizers, paper industry, textile industry, and also used as an agent for pleurodesis.[4] Industrial hygiene and personal protective measures plays a vital role in prevention of occupational lung diseases. We report a case of talcosis in a person working in a talcum powder manufacturing company in the packing section. This case is a pure form of occupational lung disease due to talcum powder exposure.

CASE REPORT

A 51 year old male was admitted in chest ward at Meenakshi Medical College and Research Institute, with complaints of dry cough for 5yrs which was progressively worsening for the past 5 days and complaints of breathlessness for the past 2 years, which is of grade 1MRC [Medical Research Council], and progressively worsening and increased for the past 5days which is of grade 3 MRC. The cough is mostly dry and there is no diurnal and postural variation associated complaints are loss of appetite and sleep. No history of hemoptysis, orthopnea, paroxysmal nocturnal dyspnea, wheeziness and chest pain.

His occupational history revealed he was working in a talcum powder manufacturing company in the

packaging section for more than twenty eight years. He was working 8hrs/day and for 6days/week with no personal protective measures. The type of work involved is crushing of the raw material into powder which is then subsequently packed and supplied. Patient is diabetic for the past 3yrs and not on regular treatment, there is no history of Anti Tuberculous Treatment, he is not an asthmatic, hypertensive and non smoker.

For general physical examination patient was moderately built and moderately nourished, tachypneic with RR>28, grade 2 clubbing present, there is no pallor, Icterus, cyanosis, lymphadenopathy and pedal edema. Blood pressure and pulse were normal. On auscultation of the respiratory system revealed B/L end inspiratory Velcro crackles were heard in mammary, inter scapular, infra scapular region and scattered wheeze was present. Cardiovascular, Abdomen and CNS system examination were all normal.

Investigations: Complete haemogram showed an elevated total count with neutrophilicleucocytosis, blood sugar, renal and liver function tests were normal and there was no induration on mantoux test. Microbiological investigations on sputum for AFB smear and culture were negative.

Radiological imaging was done Chest xray (fig-1) showed B/L diffuse reticulo nodular pattern more in the upper and mid zone, a non homogenous nodular opacity was noted in right mid zone. B/L hilarprominence was present with conglomerulate nodules, fiber-optic strands and B/L hyperinflation were present.

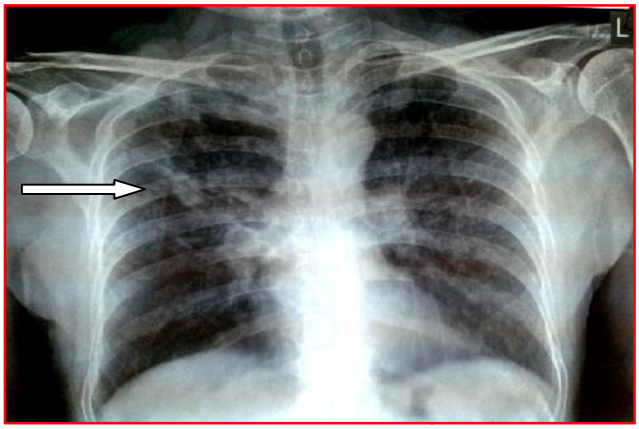

Fig 1: X-ray Chest PA shows b/l hyperinflation and diffuse reticulo nodular pattern with nodular opacity

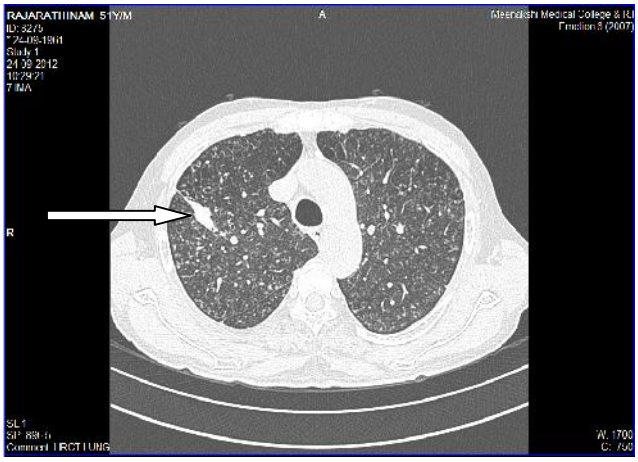

Fig 2: HRCT Chest showing a conglomerulate nodule in the apicoposterior segment with reticulonodular opacities.

High Resolution Computed Tomography chest showed diffuse reticulo nodular opacities, predominantly in the right upper, middle lobe and left upper lobe, fibrotic strands with pleural tags(fig-2) in the apical andconglomerulate nodules in anterior segment of right upper lobe(fig-3) and superior segment of left lower lobe, empysematous changes in B/L lower zones(fig-4) and mildly prominent pretracheal and subcarinallymphnodes.

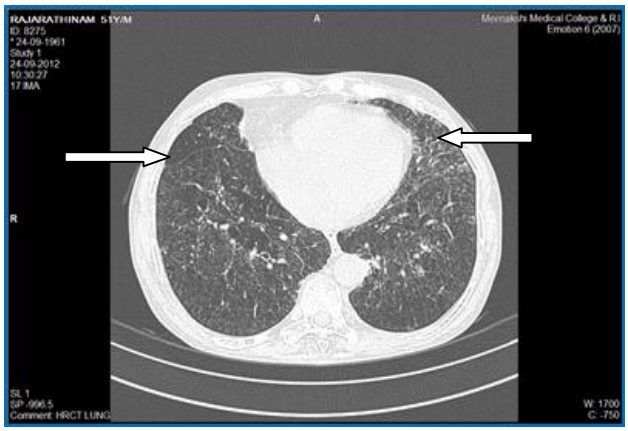

Fig 3: HRCT Chest showing, a.emphysematous changes and b.interstitial reticular pattern.

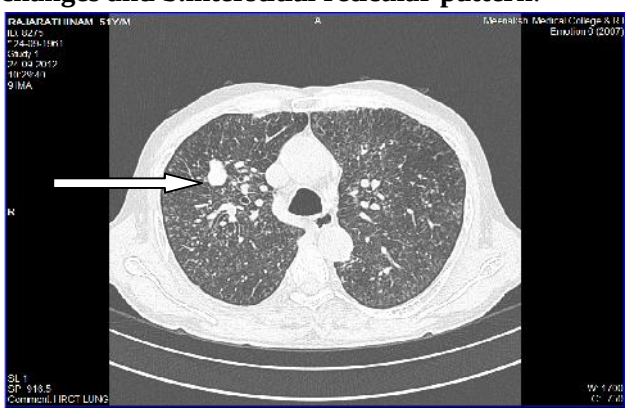

Fig 4: HRCT Chest showing a conglomerate noduleinthe right apical segment.

Six minute walk test[5] was done for this patient total distance covered is 290meters, baseline spo2 is 92% post test is 88%, MRC baseline is 1 and post test is 2.ECHO findings are normal Lv function, normal PAP.

PFT shows restriction with severe small airway obstruction and DLCO showed 50% reduction. Bronchoscopy with Transbronchial lung biopsy revealed interstitial fibrosis, in bronchial wash for AFB and culture were negative however *Candidaalbicans* was grown. Biopsy specimen could not be sent for electron microscopic examination to detect talc crystals due to unavailability of the electron microscope in our hospital.

DISCUSSION

The occurrence of occupational lung diseases is decreasing due to improvements and awareness in occupational health in recent years. Talc pneumoconiosis is a rarer form of occupational lung disease. Talc is a heterogenous group of hydrated magnesium silicate that are commonly found in mineral deposits containing other minerals like carbonates, quartz, amphiboles and serpentines[6]with multiple uses as a lubricant and filter in cosmetics, paper, rubber manufacturing, paints, building materials, leather finishing, fertilizer industry, ferrous and non ferrous castings, textile industry, and also used as an agent for pleurodesis. Cosmetic talc should be free of asbestos, but industrial grades may contain it as well as other minerals such as quartz etc., hence should be carefully handled.

The first case of talcpneumoconiosis was reported by Thorel in 1896 and the first fatal case due to massive aspiration of baby powder in 1954 by Cless and Anger.[2] There are only a few reports of pulmonary talcosis associated with talcum powder use.

Four different forms of pulmonary disease by talc have been described: 1.Talc associated with silica particles in mine workers (talco silicosis), 2. Talc associated with asbestos fibers (talco-asbestosis), 3.inhalation of cosmetic talc (talcosis) is uncommon, 4. Intravenous administration of talc which is commonly seen.[7]

Clinical manifestations of talcosis consist of dry cough, dyspnea and can progress to pulmonary fibrosis, pulmonary artery hypertension, corpulmonale and death. When fine particles of talc dust are deposited in the lungs, macrophages that ingest the dust particles will set off an inflammation response by releasing tumor necrosis factors, interleukin-1, leukotriene B4 and other cytokines. In turn, these stimulate fibroblasts to proliferate and produce collagen around the talc particle, thus resulting in fibrosis and the formation of the nodular lesions.

Talc miners have shown to have an increased risk of pleural plaques, diffuse pulmonary fibrosis and lung cancer. There is no evidence that exposure to talc is carcinogenic unless associated with fibrous tremolite. Talc may also initiate broncho constrictive episodes when inhaled by babies and is of course one of the means by which intravenous drug abusers accidentally kills them. The pure form of talc has relatively fewer health effects on humans, but talc contaminated with asbestos, especially asbestos, particulates that are longer than 5 µm with a length-to-width ratio of 3:1 or more, causing severe health problems. [8] Inhalation of asbestos can result in a chronic inflammatory response.

In this case the company did not provide any personal protective measures to the workers and there was no education about the nature of work was given. Patient's coworkers also suffered by these same complaints and few of them died who were having > 30 years exposure.

Fraser and Pare[9] reported a case of a young woman who had inhaled large quantities of talc from her hands during a postpartum depression. When seen, she had dyspnea on exertion for several months and interstitial infiltrates were reported on chest roentgenograms. The diagnosis was established by open-lung biopsy. Gould and Barnardo[8] reported a case of a- seven-year- old girl who had acute respiratory distress after accidentally inhaling large quantities of powdered talc. Chronic bronchiectasis developed in this child and pulmonary function studies had all the features of both obstructive and restrictive defects.

The high-resolution computed tomography (HRCT) finding of small centrilobular nodules associated with heterogeneous conglomerate masses containing high-density amorphous areas, with or without panlobular emphysema in the lower lobes, is highly suggestive of pulmonary talcosis.[10-11]

Confirmation of talcosis is by open lung biopsy and demonstration of bifringent talc crystals in fluoresence electron microscopy. The characteristic histopathologic feature in talc pneumoconiosis is the striking appearance of birefringent, needle-shaped particles of talc seen within the giant cells and in the

areas of pulmonary fibrosis with the use of polarized light in light microscope, and other methods are radiographic fluorescence scanning electron microscopy and energy dispersions radiographic spectroscopy can demonstrate talc crystals (fig-5). In Our patient the biopsy specimen could not be subjected for electron microscopic study due to technical issues. However diagnosis of talcosis was made in our case of strong clinical history (mainly occupational exposure), radiological imaging studies and biopsy findings of interstitial fibrosis.

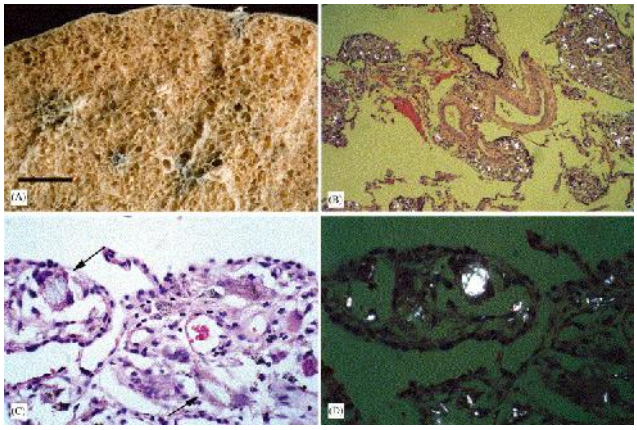

Fig 5: Lung biopsy specimen and electron microscopic view of bifringent talc crystals.[8]

CONCLUSION

Although various cases of talcosis have been reported, our case is reported because of rare exposure to pure talc as an occupational hazard. Hence, early diagnosis and recognition of these underlying diseases is important in order to institute personal protective measures and avoidance of exposure in the industrial settings.

Conflict of interest; Nil

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