

SQUAMOUS CELL CARCINOMA OF THE LUNG IN A DRY BATTERY WORKER

Pages with reference to book, From 49 To 50

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Workmen in certain occupations are unduly prone to develop cancer. The elements incriminated in the causation of lung cancer are uranium, nickel, chromate, cobalt, cadmium, asbestos, radium, and arsenic¹. The following case report aims at directing attention to a possible relationship between lung cancer and manganese dioxide used in the manufacture of dry batteries.

CASE REPORT

A 25 years old Pakistani male, non-smoker working in a dry battery manufacturing plant for 7 years, presented with complaints of severe dyspnoea for 2 months. He also admitted to having had productive cough, hemoptysis and weight loss for the past 14 months. On examination he was found to be orthopnoeic, centrally cyanosed with grade I clubbing and palpable pea sized lymph node in the left supraclavicular fossa, trachea shifted to the left with diminished chest expansion and air entry, also crackles and rhonchi on the same side. Examination of the cardiovascular system revealed features of pulmonary hypertension which included a left parasternal heave, loud P2 and right ventricular hypertrophy on the echocardiogram. Genitourinary, gastrointestinal and other systems were unremarkable. Investigations revealed a haemoglobin of 16.7 gm% and an ESR of 4mm in the 1st hour, a negative tuberculin test with normal blood chemistry. Chest radiographs showed an elevated left dome of the diaphragm with lytic erosion of the 7th right rib and subsequent tomograms showed bilateral multiple coin lesions. Pulmonary function tests revealed features of restrictive airway disease with hypoxia and respiratory alkalosis on arterial blood analysis. Abdominal sonograms and liver scan were normal. Supraclavicular lymph node biopsy and sputum cytology were inconclusive. Aspiration cytology from the involved rib showed squamous cell carcinoma, the appearance of which was suggestive of bronchial carcinoma as the primary site. He could only receive a single course of chemotherapy before his demise.

DISCUSSION

Occupational association with the etiology of bronchogenic carcinoma in our patient is undoubted as he fulfilled the characteristics described for occupational cancers, i.e., these cancers appeared only after long exposure in the related occupations. The average age incidence was earlier than that for cancers in general, they were invariably preceded by precancerous lesions and, unlike ordinary forms of neoplasm, these tumours when first discovered were frequently multiple². None of the chemical agents used in the manufacturing of dry batteries has so far been incriminated in the causation of cancer, but human and animal studies have both proved the role of manganese in producing injury to the respiratory epithelium depending upon dose and duration of exposure^{3,4}. Evidences of chronic respiratory disease in our patient make it logical to postulate that excessive and prolonged exposure to manganese produced precancerous chronic lung injury. This is further supported by an ongoing study (to be published later) in which we have observed an unusually high incidence of occupational asthma and chronic cough amongst the workers in the same unit. It may appear strange that advanced countries which pioneered dry battery manufacturing, have never reported such an event. This may be due to the

fact that workers in these countries are covered and protected from raw material product and dust exposure by strict safety laws. For example, the maximum allowable air concentration (MAC) of manganese in the United States considered safe is 5 mg/m³ and that in Yugoslavia³ is 2 mg/m³. It is regrettable that such laws do not govern the safety of workers in this country with the result that air concentration of toxic substances far exceed any recommended values. Furthermore a six day week with an eight to ten hours/day work schedule increases the duration of exposure and the quantity of occupational dust inhaled. We are publishing this case report in the belief that manganese is a carcinogen and we hope that other scientific workers will in future substantiate our findings.

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