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ASBESTOSIS AND LUNG NEOPLASMS
FURTHER CONTRIBUTION TO A CLINICAL CASE

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For some time now, researchers have tried to evaluate the effect of a series of agents found in the air of the working environment on the generat of heteroplastic growths in the respriatory tract, with particular emphasis on the lung.

As a matter of fact, recent statistics indicate a significant increase of neoplasias of this nature.

Lately, improved information regarding the toxic inhalants present in the working environment has brought into focus the possible effect of a gre number of agents that could contribute to, or actually induce, such condit

It is quite obvious that the attention of researchers has been direct primarily to agents whose physical and chemical properties are responsible for their marked irritative action at the level of the various mucosae. Accordingly, microtraumatic phenomena occurring at this level have been st in regard to their involvement in the development of metaplastic condition affecting various organs and tissues.

One such agent, which is well capable of acting via a chronic irritati effect at the level of the respiratory tract mucosa by producing irreversi sclerogenous lesions, is asbestos.

Examination of the pertinent literature fails to yield much informati on the relationship between asbestosis and lung neoplasias, although there is much discussion regarding their occurrence which, according to some is but pure coincidence, while others claim lung fibrosis originating from t occupational condition might play a role.

The first observation of such an association has been reported by Ly and Smith, in 1935. Subsequently, many other investigators have reported

simultaneous presence of lung neoplasia and asbestosis-induced lung fibros in both live and autopsy material (Egbert; Geiger; Wedler; Desmeules; Rous Giroux and Sirois; Lynch and Connan; Rombola; Chauvet).

Anatomicopathological statistics compiled by Gloyne, Wedler, and Doll revealed that the incidence of this particular association varied from 10- a finding which would seem to definitely confirm the effect of asbestos f: inhalation on the induction of lung neoplasia.

Furthermore, experimental studies performed by Nordmann and Sorge ha shown the presence of lung carcinomas in 20% of the mice exposed to the i: lation of asbestos dust. This firding also supports the claims regarding carcinogenicity of asbestos.

On the contrary, Vigliani (1940) failed to find lung cancer in any o. 76 patients with asbestosis that he studied. Furthermore, systematic inve. gations carried out by Braun and Truan (1958) in a large number of asbest workers, in Canada, showed that the incidence of lung neoplasia in this p ticular group was no higher than that recorded for individuals not expose asbestos dusts.

A consistent finding in studies demonstrating an association between neoplasia and the occupational condition mentioned has been a history of exposure to risk by the affected individuals.

The presence of proliferative processes primarily in the lower lung which is also the site of the most advanced degree of lung fibrosis, is i sharp contrast to the normal site of neoplasia, which is encountered mor frequently in the central and upper lung lobes. According to the statist mentioned above, it emerges that the incidence of the disease among fema:

is high, as opposed to the well-established finding that lung neoplasia affe almost exclusively the male sex.

All the findings could be indicative of more than a simple causal re-lationship between asbestosis and lung neoplasia.

The patient described in the present report represents a relatively in-teresting contribution to other similar cases described earlier, although no representing any decisive etiopathogenetic feature.

CLINICAL REPORT

The patient, a 54 year old worker, was employed as an insulator since 1

He was in good health until the month of September 1960 when he starte having persistent cough and exertional dyspnea. Radiological examination performed at that time revealed darkening of the lower lung field. Wide st emergingfrom the enlarged hili and advancing towards the base of the lungs which, in turn, showed sharp reticulation.

Based on these findings, a radiological diagnosis of asbestosis was established and the case was forwarded to the insurance authorities for disability.

By June 1962, the patient presented gradual exacerbation of the dyspne symptoms, together with a cough with little expectoration; furthermore, the patient complained of an oppressive pain in the right hemithorax.

Objective examination demonstrated a definite basal hypophonesis, rou and diffuse breathing over the entire pulmonary field where there was also evidence of a noise known as "fresh snow pounding" (D'Antuono et al.). Th was no evidence of any other significant objective alterations.

Electrocardiographic recording was negative.

Urine examination was also negative. Examination of the sputum demonstrated the presence of bacterial flora consisting of cocci, gram-positive and gram-negative diplococchi;the search for Koch's bacillus was also negati

Erythrocyte sedimentation rate was high (I.K. = 37). Respiratory function tests revealed the presence of a constrictive type of ventilatory insufficiency of average severity.

Fig. 1

Hematological examination: red blood cells: 4,800,000/mm^3; white blood cells: 8,000/mm^3; Hb: 72%; hematocrit: 0.95; N: 67%; E: 2%; M: 6%; L: 25%.

R. W. and Meinicke: negative.

Standard chest x-ray, in addition to the previous findings recorded at the level of the lower pulmonary fields, also demonstrated the presence of parenchymal darkening at the level of the right cardiodiaphragmatic angle, roundish, with well-defined edges and homogenous density (Fig. 1). Repeat radiographic examination performed 20 days later confirmed the initial picture, without any appreciable changes.

On account of the inability to define the nature of this opacity, and

due to the negative results yielded by the laboratory tests (including cyto-logical examinations and histological study of the expectoration), except fo: the increased sedimentation rate, the patient was placed on antiblastic trea ment (chloramines) in order to determine the eventual changes in the lung findings, about 1 month later.

Radiographic examination performed at this time (Fig. 2) confirmed the presence of a mass located to the right of the heart, well evident strati-graphically in the anterior planes (Fig. 3), whose size was actually greater than that recorded during the previous radiographies.

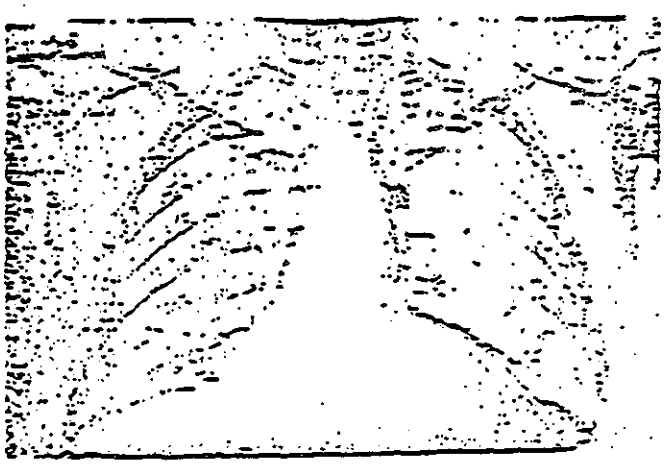

Fig. 2

Fig. 3

Soon after the last examination, the patient presented blood in th expectorate, while pain and dyspnea increased; the general condition of the patient deteriorated gradually. He had persistent fever, and died in cachexia early in December 1962.

As a result of the rapid decline of his general condition, and especia based on the radiographic and stratigraphic picture which, as described abc demonstrated the presence of a definitely progressing parenchymal opacity, diagnosis of asbestosis associated with lung neoplasia was established.

The features described above lead to a series of interesting observat:

Thus, first of all, it appears that the association mentioned is relat rare. As a matter of fact, we encountered only a single case of neoplasia a total of more then 30 individuals exposed to asbestos.

The group observed by us is rather small and does not allow any defin: conclusions, but it confirms the discrepancy of the data reported on this : in the German and English literature (which support the hypothesis of a re tively high incidence of neoplasia), on the one hand, and the findings of Italian investigators (Vigliani, Rombola) who found that the rates of neo- plasia are much less significant, on the other.

It appears that the discrepancies and the subsequent differences in t evaluation of the oncogenic activity of asbestos fibers could be attribut to intrinsic geographical differences in the composition of asbestos itsel a fact reflected in the statistics obtained in various countries, rather th to errors performed in the diagnositc investigation of the workers at risk

Actually, as is well-known, the variety of asbestos used in Italy is most exclusively white asbestos, a material with a low iron content as cor

to the blue asbestos used by the workers studied in the German and Englis statistics.

Nevertheless, the differences in the chemical composition of asbesto could be relevant if the role played by the predisposition of the individ at risk, and the severity of the risk itself, are well-known.

The role of asbestos per se, a material whose activity is explained great number of fine needles present in the asbestos fiber, should be an factor only for the induction of trauma at the level of bronchial mucosa sequent to long-term exposure.

In conclusion, it seems that asbestos alone has only a predisposing similar to that exerted by other agents having similar mechanisms, at dif levels.

SUMMARY

The case history of a patient where asbestosis was associated with a plasia of the lung is described briefly. The discrepancies recorded in literature on this particular subject are pointed out, and the statisti experimental, and possible oncogenic properties of asbestos are disc Although not regarded as definitely carcinogenic, the chemical compositi of the agent is considered to be a significant factor.

BIBLIOGRAPHY

1. Braun D. C.; Truan, T. D.: An epidemiological study of lung cancer i asbestos miners. Arch. Industr. Health 17: 634, 1958.

2. Cartier, P.: cited by Rombola.

3. Chauvet, M.: Asbestosis and bronchial cancer. Presse Med. 66: 908,

4. D'Antuono, G.; Mazzanti, C.; Farina, S.: Clincal and radiographic ob

vations on lung asbestosis. Giorn. Pneumol. 5: 1, 1961.

5. Doll, R.: Mortality from lung cancer in asbestos workers. Brit. J. Indust. Med. 12: 81, 1955.

6. Gernez-Rieux, C.; Marchand, M.; Mounier-Kuhn, P.; Policard, A.; Roche, Occupational respiratory diseases. Masson, Paris, 1961.

7. Isselbacher, K. J.; Klaus, H.; Hardy, H. L.: Asbestosis and bronchoger carcinoma. Report of one autopsied case and review of the available literature. Amer. J. Med. 15: 721, 1953.

8. Linquette, M.; Voisin, C.: Silicosis and other pneumoconioses. Flamm Paris, 1960.

9. Lynch, K.; Connan, M.: Asbestosis analysis of 40 necropsied cases. I Chest 14: 874, 1960.

10. Lynch, K.; Smith, W. A.: Pulmonary asbestosis. Carcinoma of lung in asbesto-silicosis. Amer. J. Cancer 24: 56, 1935.

11. Nordmann, M.; Sorge, A.: cited by Rombola.

12. Rombola, G.: Asbestosis and lung cancer an an asbestos textile plant. Med. Lavoro 46: 242, 1955.

13. Wedler, H. W.: Asbestosis and lung cancer. Dtsch. Med. Wschr. 69: 57 1943.