JMEA 3984

MARGINALIA
REDACTED

Deutsch Gesundheitsw., volume 13, No. 8, pages 1101-1103, 1958

INCIDENCE OF LUNG CANCER AMONG GERMAN ASBESTOS WORKERS

H. Bohlig and G. Jacob

JOHNS-MANVILLE CORPORATION
HEALTH, SAFETY & ENVIRONMENT DEPT.
LIBRARY

ASBESTOS INFORMATION ASSOCIATION/
North America
1835 K Street, N. W. Suite 402
Washington, D. C. 20006

Once the correlation between lung asbestosis and lung cancer was made known (Gloyne, Lynch and Smith), several cases of lung carcinoma in conjunction with asbestosis (LCA) have been observed in Germany since the year 1938 (Nordmann, Linzbach and Wedler, Welz, Boemke, Jacob and Bohlig). Since then LCA is mentioned in the German literature as one of the most frequently observed complications (Holstein) of asbestosis. Still, only 16 cases of malignant tumors of the thoracic cavity in conjunction with lung asbestosis were published in Germany prior to 1954 (Jacob and Bohlig).

In the city of Dresden in 1956, a fifth case of LCA (63-year-old male, asbestosis I, small cell carcinoma of right upper lung) came to us for autopsy (Scheid, written report 1956). One additional case of LCA was described by Bohme in Bochum (written report 1957) and autopsied but not published by di Biasi so that between the years 1938 and 1956, 18 cases of LCA were observed in Germany. This is a fairly small number if we consider that this was for a period of 20 years and for a total number of approximately 4000 German asbestos workers at that time.

The LCA incidence which is considered to be high is exclusively based on autopsy statistics obtained from the literature (Behrens). The figures quoted ranged between 12 and 17% (literature by Jacob and Bohlig). Still the highest incidence is reported in England (Doll). Over a period of 10 years, Cartier observed in Canada eight cases of lung cancer among asbestos workers, including three which were not accompanied by asbestosis. Few cases have been reported in the United States. The

first LCA case observed in Italy was published in 1955 (Rombola). Prior to the year 1947, Wegelius and Noro did not observe any cases of LCA among persons suffering from asbestosis in Finland; the same applies to Frost, Georg and Mzller in Denmark prior to 1956. No cases of LCA have been reported as yet by the Soviet Union and South Africa. Serious doubts therefore exist with regard to the 13% rate of incidence calculated based on the autopsy statistics available.

Including Doll's cases and our own five cases of LCA, approximately 80 cases were published in worldwide literature prior to 1956 (literature by Bohlig, Jacob and Kallabis). This low number adds strength to our opinion that the incidence quoted based primarily on English autopsies is not to be generalized since the autopsy material was not selected at random.

The chance of humans contracting lung cancer has considerably increased over the past decade due to the increased incidence of bronchial carcinoma and the incidence of lung cancer is now 12 out of 10,000 living males and more than one out of 10,000 living females per year at the carcinoma-prone age (Schinz, Fig. 1).

Comparative studies performed in 1954 based on the Dresden Hospital Records of 343 cases of asbestosis showed that the number of known LCA cases against the number of persons exposed to asbestos dust at that time did not indicate a higher lung cancer hazard as compared to the total number of lung tumors among the general population. For female asbestos workers, however, the proportions were different. As far as we can judge from the small quantity of data available, it would appear that the

chance for a female asbestos worker to contract LCA is as high as that of a male suffering from asbestosis.

This difference with females of the general population not occupationally exposed to asbestos and the irregular attack of the lung lower lobes with LCA clearly indicate that there have to be correlations between lung asbestosis and carcinoma (Jacob and Bohlig). Based on the current knowledge on carcinogenesis, it is as yet impossible to determine whether these are of a physical or chemical nature and just how significant is the role played by patients' predispositions to carcinoma. However, we do know that the increased incidence of LCA among asbestos workers does show that all humans more or less have the same predisposition to carcinoma and that this should increase in parallel with the life expectancy of the population. Environmental factors could be responsible for the localization of the carcinoma in this or that organ. The search for other types of carcinoma in the Dresden Hospital records show the following: In addition to the LCA cases, only four cases of carcinoma are reported prior to 1954 (Jacob and Bohlig). These results underline well the interesting observation made by Pellers with regard to the "inverse association."

To better study the incidence of LCA among asbestos workers and analyze our own results, the number of cases studied was expanded to include all cases up to the year 1956. All cases of asbestosis reported to the silicosis statistics bureaus of Dresden, Jena and Swickau (Director: Dr. G. Sepke) prior to the end of 1956 were thus studied. On the whole, this included 517 cases. The asbestosis cases originated from the Saxon and Thuringen asbestos industry with approximately 2000 workers. Thirty-

Lung Cancer
In cases per year/10,000 living persons

KEY: 1) expectancy among total population; 2) age classification, 50-79 years old; 3) mortality among German asbestos workers, 20 deaths over a period of 20 years; 4) around 4000 asbestos workers; 5) among 500 autopsied cases of asbestosis.

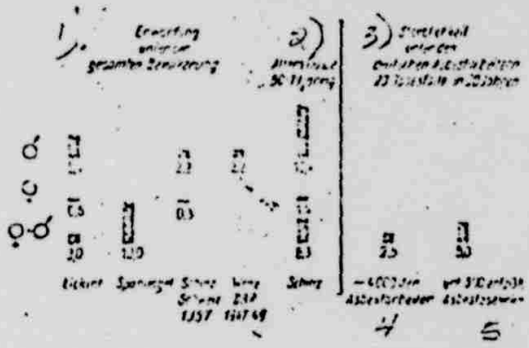
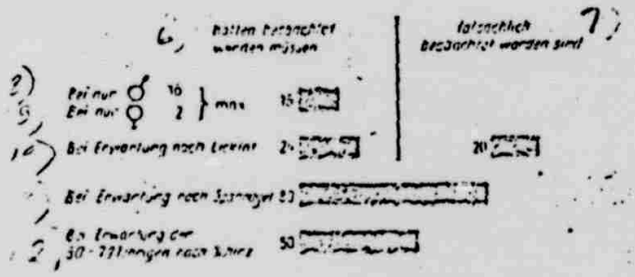


FIGURE 1.

Number of LCA cases rounded off as mentioned above.

FIGURE 2. Number of cases with lung cancer expectancy equal to that of the entire population over a period of 20 years (up to 1956) among approximately 4000 German asbestos workers.

KEY: 6) should have been observed; 7) were actually observed; 8) out of only...; 9) out of only...; 10) in accordance with Lickint's expectations; 11) in accordance with Spanaget's expectations; 12) in accordance with Schinz' expectations for 50-79-year-olds.



four-cases have already passed away; 11 were autopsied, including five LCA cases. Twenty-nine cases were missing as of February 1945; however,

since all of these originated from the Dresden region, we can assume that these very probably also passed away. The three cases observed by Saupe and autopsied by Nordmann could very well belong to the number of missing cases.

If for comparative purposes we equate the number of approximately 500 cases of asbestosis observed over a period of 20 years with 10,000 living persons of the normal population over a period of one year, we can see that the 500 asbestosis cases observed after age 50 (Jacob and Bohlig) as compared to the more endangered age classification according to Schinz, we can expect a mortality rate of 6.3 cases over a period of 20 years due to normal bronchial carcinoma; this means that the five LCA cases which were actually observed were still under the normal lung cancer expectancy of the persons examined (Figs. 1 and 2).

West German authors who were questioned with regard to the incidence of LCA have confirmed that, as far as they are concerned, there is no special incidence of LCA (Bohme, di Biasi, Worth). Now what work physician responsible for a number of workers in a fairly large plant has not reported a few cases of bronchial carcinoma among his workers?

So as not to overlook any cases of LCA among persons previously employed in the asbestos plants of the German Democratic Republic, all cases of bronchial carcinoma reported by the responsible tumor centers of all localities were studied with the collaboration of the authorities responsible for tumor control in the Gera and Dresden regions. These included mostly workers of the German Democratic Republic employed in

asbestos treatment plants. Out of 1013 cases of bronchial carcinoma reported to the tumor control stations since the year 1952, 22 were found to have worked in an asbestos plant at one time or another. Further research in other plants showed that only four cases had actually been exposed to the dust. Of these, two cases were autopsied and found to be free of asbestosis. In another case, a whole series of roentgenological images are available to show that there were no roentgenological signs of any asbestosis. In a fourth case which was further studied due to the lack of documentation, the presence of asbestosis could be neither confirmed nor denied so that this case remains questionable. However, were this an actual case of LCA, there would be no indication that said LCA in this asbestos worker would actually represent a severe danger or a frequent complication of asbestosis.

In conclusion, the following can be said with regard to the LCA problem: The incidence of LCA is not higher than that of lung cancer among the general population; as far as females are concerned, this incidence is equal to that of male asbestos workers.

The pathology of LCA shows that the point of origin definitely favors the lower lobe of the lung section most affected by asbestosis (Wedler, Jacob and Bohlig); there also seems to be more differentiated forms as well as serosa tumors with LCA than with lung cancer of non-occupational origin. Females appear to contract the disease at a somewhat lower age than males (Bohlig, Jacob and Kallabis). The carcinogenesis has not as yet been explained but we can consider the original correlation between lung asbestosis and bronchial carcinoma as a proven fact. One

case published by Leicher of a peritoneal tumor in a patient suffering from asbestosis tends to indicate that the mechanical momentum promoting the development of the tumor does not play an exclusive role.

Author's Address: Dr. med. H. Bohlig, Meiningen, Am Weidig 12;
Dr. med. G. Jacob, Karl-Marx-Stadt, Drosselweg 14