OCCUPATIONAL HEALTH

News & Views

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Malignancies in Asbestos Workers - A Preliminary Report -

Within recent years and months there has been a considerable amount of material in the literature which indicates that asbestosis is directly related to the incidence of malignant tumors and cancer.

As early as eight years ago a Pennsylvania pathologist reported that he had seen at autopsies many cancer cases in persons who also suffered from asbestosis. The pathologist is on the staff of a hospital which receives most of the patients from a nearby town where a large asbestos plant is located. This plant makes asbestos textiles and also brake linings and clutch facings. The findings of the pathologist have created concern in the asbestos industry and it was felt appropriate for our health department to review the problem.

To obtain as complete a story as possible the record rooms of six hospitals which draw their cases particularly from the area of the asbestos plant were searched for cases where asbestosis was considered during the period between 1956 and 1964. Seventy-five hospital records coded as asbestosis were located. These were people who either were diagnosed on admission, on x-rays, or at autopsy to have asbestosis or asbestosis was mentioned in the differential diagnosis.

After obtaining the 75 records, an attempt was made to locate these former patients. A large number were no longer alive and their survivors had to be contacted. For these 75 an occupational and smoking history was obtained from their survivors and/or from plant management. Seven either had not worked at this particular asbestos plant or the diagnosis had been rejected.

This left 68 asbestos workers who had worked in one particular plant. Further study of these records showed that 21 among them not only had evidence of asbestosis but also were suffering from cancer. Twelve of these had lung cancer and nine had various other growths such as bladder cancer, leukemia, etc. The smoking history of the 12 lung cancer cases revealed that five had never smoked which is more or less the same distribution of smokers versus non-smokers as in the general population. Of the nine cases with other malignancies, two never smoked and three were cigar smokers only.

Another interesting feature was that among the other cancers, not the lung cancers, there was one case of a malignant mesothelioma.

Another interesting finding was that of the 21 cases with cancer 13 worked in the textile department of the plant and four worked in brake line manufacture. The department where one man worked remains unknown and the rest worked at various other jobs.

Two of the 11 lung cancer cases and one of the lymphoblastoma cases had worked in the asbestos plant for a total of only six months which is a rather short exposure, and one wonders how much this short exposure may have contributed. Eighteen of these 21 cases had started work in the plant prior to 1940 and 12 had started work prior to 1920.

Of the 21 cases of cancer 11 were born before 1900 and only one was born after 1910.

Microwave Ovens -

Personnel of our Region III (Meadville) have recently completed a study of the hazards associated with exposures to microwave radiation in connection with operation of microwave ovens. These ovens are popular in food-service establishments in general and are gaining popularity for self-service facilities in factory and college cafeterias, in super-highway rest stations, and in recreational centers such as bowling lanes.

The principal hazard of exposure to microwave radiation is the biological effect resulting from the heating of body tissues. This study was concerned with the monitoring of microwave radiation leakage from oven units now installed in the Region III area and in evaluating the hazards or potential hazards which were present.

No detectable radiation was found at any location on the units except around the periphery of the door and in the area of the door front. Measurements made at varying distances from the ovens indicated diminishing levels with no detectable radiation intensities at a distance greater than about one meter from the oven. However, the radiation released from 79% of the units was somewhat in excess of that considered safe for indefinitely prolonged exposure and 25% released radiation in excess of the criteria considered potentially hazardous. Although the intensities found are not related to exposure time, the findings of the study indicate that a potential hazard does exist and measures to minimize it should be considered. These would include:

1. The construction of ovens should utilize features which prevent the release of microwave radiation.

2. Interlock systems (to permit oven operation only when door is closed) should be designed to prevent circumvention of their use.

3. Units should be adequately labeled to alert owners and operators of the potential hazard of operating units in manner other than prescribed procedure.

4. Owners, operators and service personnel should be made aware of the hazard of exposure to microwave radiation.

5. Units should be monitored periodically to detect leakage or faulty operational devices.

Occupational Health Bills in Legislative Hopper -

The Pennsylvania Legislature is currently considering several items of proposed legislation dealing with occupational health matters. A Senate bill on radiation would create an Advisory Committee on Atomic Energy Development and Radiation Control; empower the Governor to enter into agreements with the federal government for assumption of certain regulatory powers; and would confer certain

powers and duties on the Department of Health with respect to control and regulation of radiation sources, including provision for licensing and registration. This bill has passed the first and second readings in the Senate with the third reading scheduled for an early date. -- A Senate bill amending the Occupational Disease Act and providing increased benefits for silicosis, anthraco-silicosis, and asbestosis is now in the Senate Labor & Industry Committee, but a similar House bill has passed the House and is also in the Senate Labor & Industry Committee. -- A House bill which would provide for the elimination of the statute of limitations on the time and circumstances under which disability or death from silicosis or anthraco-silicosis and asbestosis must occur in order to be compensable has passed the House and is in the Senate Labor and Industry Committee. A similar House bill is still being considered by the House Workmen's Compensation Committee.

Conference Proceedings -

We regret that the printer's estimated date of delivery for the Proceedings of the Pennsylvania Governor's Conference on Pneumoconiosis (Anthraco-Silicosis) was somewhat over-enthusiastic! However, the Proceedings are now definitely available from the State Book Store, Room 54, Main Capitol Building, Harrisburg 17120. The price is $1.58 postpaid, including sales tax, and checks should be payable to Commonwealth of Pennsylvania.

Coal Tar and Pitch -

Whenever coal tar or pitch is heated, smokes, fumes and vapors are released into the air. Approximately 10 percent of these volatiles are polycyclic hydrocarbons. Heavy, or large molecular weight, polycyclic hydrocarbons are known or suspected to be cancer-producing. A problem with exposure to these is that cancers frequently develop many years after exposure to contamination has ceased.

Polycyclic hydrocarbons vary in stability. Some remain in the form in which they are generated, and others combine with each other and form higher molecular weight compounds. Because of this varying stability, the American Conference of Governmental Industrial Hygienists has suggested a threshold limit value of 0.2 milligram per cubic meter of air for exposure during an eight-hour working day for volatile components of coal tar pitch which are soluble in benzene. Benzene-soluble components are those likely to produce cancer.

Authorities in the field of tars believe that the volatile components of native asphalt are much safer than the volatile components of coal tar. Because of the stability factor, however, care should be exercised in the handling or processing of either.

The best method of controlling the health hazard is to prevent contact with the volatiles. This may be accomplished by local exhaust ventilation at the point of origin of the contaminant, by suitable respiratory protective devices, by suitable protective clothing to prevent contact with the skin and by a combination of these control measures. As with most exposure to industrial contaminants, medical supervision of employees is an important adjunct to engineering control. Both are essential to the prevention of health hazards.

Handle Chemicals Properly -

A recent tragic accident which occurred in Pennsylvania, although not strictly within the bounds of occupational health, points up the hazard of improper handling of chemicals. As a result, one person died and another received slight acid burns over an extensive portion of his body.

The exterior of a stone building was being renovated by cleaning of its lower portion with hydrofluoric acid and by sandblasting of the upper areas. A person employed in the building obtained a quantity of the acid solution from the cleaning crew for home use. Apparently neither the crew nor the individual was aware of the action of hydrofluoric acid on glass, and the liquid was placed in a glass container which was left in a hallway to be picked up after work. The container was near a doorway to one of the offices. About ten minutes before quitting time a member of the building security force and a female employee were standing at the doorway approximately three feet from the glass container of hydrofluoric acid when it burst, spraying acid and evolved gases on them. The security officer received acid burns on his back and on the backs of his legs which were toward the container, and the woman who was facing the container received such injuries as to cause her death approximately one hour later.

It is a well-established chemical fact that the action of hydrofluoric acid on glass evolves gas as a by-product. Thus the combined etching action of the acid on the glass container and the increased pressure produced by the gas build-up caused the container to burst with the regrettable results above stated.

Manganese as a Toxic Metal -

The Division initiated a manganese surveillance project with the report of two cases of manganese poisoning in the manufacture of railroad track frog switches in one company, and the possibility of a third case in another establishment.

Some of the primary locations of exposure to manganese are: 1, steel plants - pouring of the metal and crushing and sizing of the ferro-manganese metal; 2, welding - the use of manganese-coated electrodes; 3, manufacture of manganese carbonyl - evolvement of manganese vapors; and 4, scrap yards - the cutting (burning) of metal containing manganese.

Although no additional frank cases of clinical manganese toxicity have been demonstrated to date, high values of manganese in urines have been found.

This study is continuing and the locations of the positive results are being kept under strict surveillance.

Occupational Health for Nurses -

A full-time, five-day course in occupational health for registered professional nurses in industry will be offered beginning Monday, November 8, 1965 by the Department of Environmental Medicine of New York University Medical Center, in cooperation with the American Association of Industrial Nurses. The course is limited to nurses with experience of five years or less in occupational health.

The program will be under the direction of Dr. David H. Goldstein, professor of environmental medicine. Sara P. Wagner, R.N., will serve as coordinator for the nurse faculty. This is the tenth consecutive year that the course has been given.

Instruction will consist of lectures and conferences given by the combined medical and nursing faculty of the Medical Center. Subjects to be covered during the week include: occupational health nursing as viewed by management, the physician and the nurse; environmental hazards; safety; mental health, individual and group behavior in an industrial setting; counselling and interview techniques; legal aspects of nursing in industry (malpractice and workmen's compensation); rehabilitation; and retirement and the problems of older workers.

Tuition will be $75. Course #484. Applications should be sent to the Office of the Recorder, New York University Post-Graduate Medical School, 550 First Avenue, New York, N.Y. 10016.

Personnel Changes -

When Gerald Kazmerski, Industrial Hygienist I, Region VII (Philadelphia), resigned recently it was found that the current civil service list for this position included the names of six females and one male! And why not? — After appropriate interviews Miss Patricia Bradley has been appointed Industrial Hygienist I in Region VII. In this capacity she will be the first of the fairer sex to hold such a position in this division since World War II days. We wish her well. — Other appointments to Industrial Hygienist I positions include: James Woodring and Norman Brown, Region III and George Tomchick, Region II. Barry Lewis and Joseph Flanagan are new Radiation Health Physicists I and II in the Central Office and Joel Lubenau is Radiation Health Physicist III in Philadelphia. Mrs. Josephine Brinley is a Nurse II in the Employee Health Service.

Notes from our Regional Offices -

Officials of a plant producing pigment-vinyl dispersions and phonograph record compounds recently requested our services to evaluate employees' exposure to various contaminants. Of particular interest was the exposure during intermittent manufacture (5-day run every two months) of a lead molybdate-vinyl dispersion. The company had isolated the manufacturing area, installed local exhaust ventilation on the roller mill and listed specific handling instructions on process sheets. These instructions included the washing of hands and face before eating and smoking, the use of a respirator (United States Bureau of Mines approved for "all dusts"), the daily changes of coveralls and care in pigment handling. The company was quite sure these "elaborate" safeguards would adequately control exposure to lead dust. In actual practice during our sampling periods, the men failed to obey the above instructions and the process speed necessary to produce a quality dispersion precluded slow careful handling. Atmospheric concentrations of lead ranged from 0.7 to 3.7 milligrams per cubic meter of air. The threshold limit value is 0.2 mg/m3, based on exposure over an eight-hour working day. Urine lead concentrations ranged from 0.15 to 0.33 mg/liter immediately after the finish of a five-day run and from 0.07 to 0.13 mg/liter two weeks later with no additional lead exposure. Urine lead concentrations exceeding 0.15 mg/liter are usually indicative of excessive lead exposure. As per our recommendations, the company plans to tighten exposure controls, increase the coverage of the local exhaust ventilating system and evaluate employees with blood-lead determinations.

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Another case of serious mercury contamination in a neon sign-producing plant was found during the month. The contamination was so excessive throughout the building that it was necessary to "zero" the mercury vapor detector out-of-doors. Of the more than twenty such firms surveyed, two have had serious contamination problems and most did not have adequate control measures. Few plant officials knew of the health hazards associated with the use of mercury. In one instance, mercury contamination was detected on the living room rug in the plant owner's residence (0.01 milligram per cubic meter of air). In all cases, appropriate recommendations were made.

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During the past two months, surveys were conducted to evaluate exposures to organic mercury dust at several seed-treating establishments. Either methyl mercury 2,3-dihydroxy propyl mercaptide or methyl mercury dicyandiamide is used in the treatment of barley or wheat. Both atmospheric and urine samples were collected. Initial results indicated that employees were receiving excessive exposures to organic mercury (threshold limit value 0,01 milligram per cubic meter of air), particularly in areas where no control measures are utilized. One of the companies contacted the equipment manufacturer and, as a result, the manufacturer designed local exhaust ventilating equipment for the machine and for the machines they produce. The ventilation was subsequently installed.

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A report reached a regional office that a dairy farmer had received a severe exposure to an irritating gas while cleaning and sanitizing a milk storage tank on his farm. Investigation disclosed that the incident occurred when the farmer, on the advice of a neighbor, put about a gallon each of acid and sodium hypochlorite solution in the tank before scrubbing it to give what he described as a "good cleaning". Chlorine gas was generated and dispersed into the air of the small milk house and the farmer probably received a significant exposure. He stated that he had difficulty getting his breath for several hours, but did not consult a physician.

Acid and sodium hypochlorite solution are normally used in separate steps in the cleaning and sanitizing procedures for milking equipment and storage tanks on dairy farms. If used as directed, these materials should create no problem. As an extra precaution, the dairy companies that collect milk in the area were asked to warn farmers not to mix acid cleaners with chlorinated sanitizers.

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While traveling to the site of a stone drilling operation to conduct a noise survey, the sound pressure level in a 1964 state car was determined. The overall level ranged from 88 to 95 decibels depending on the road conditions and speed. These noise levels are far greater than expected. An octave band analysis showed most of the noise to be concentrated in the low frequency bands (75 to 300 cycles per second) and therefore not seriously objectionable.

The Division of Occupational Health would like to fill its vacancy for an Occupational Health Physician at the Harrisburg offices. The position is under Civil Service and the salary range is $12,075 - $16,170, with 3 weeks annual leave and 3 weeks annual sick leave. Some travel is necessary and a driver's license is required. For details contact Jan Lieben, M.D., Director, Division of Occupational Health, Pennsylvania Department of Health, P.O. Box 90, Harrisburg 17120.