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Asbestos: In Connecticut, It Hasn't Gone Away

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Introduction

Asbestosis and asbestos-related diseases are reportable occupational diseases in CT, but the true burden of asbestos-related disease is difficult to estimate. For the period from January 1990 to December 1999, 110 people with asbestosis and 118 people with asbestos-related diseases were reported to the Connecticut Departments of Labor (DOL) and Public Health (DPH); six of these asbestosis cases and nine asbestos-related disease cases were reported in 1999 alone.[1] In a special study of occupational fatalities in CT, 62% and 70% of occupational fatalities identified in 1994 & 1995,

respectively, were from asbestosis and mesothelioma.[2] The majority of people with asbestos-related diseases presenting to health care facilities were exposed before 1970, when fewer exposure controls were in place. Many of these people are now 50-70 years of age. Since there is a long latency period (10-40 years) between exposure and the development of asbestos-related

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Clinical Practice Reviews

In the January 2000 issue of the *American Journal of Industrial Medicine*, a series of clinical practice reviews developed by the physicians of the New York State Occupational Health Clinic Network were published. The purpose of the reviews is to assist health care providers in the diagnosis, treatment, and prevention of common occupational diseases. There are nine clinical practice review topics: asbestos, lead, solvents, carpal tunnel syndrome, work-related musculoskeletal disorders of the distal upper extremities, low back disorders, hearing loss, work-related asthma, and medical evaluation for respirator use.

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diseases, health care providers will continue to see people with asbestosis, pleural plaques, pulmonary fibrosis, asbestos-related lung cancer, and mesothelioma for many years to come.

Asbestos

Asbestos is a group of fibrous minerals made up of two main types: serpentine and amphibole. A serpentine fiber, chrysotile, also known as white asbestos, makes up 90% of the globally produced asbestos. It is mined primarily in Canada and the former Soviet Union. The three most important amphiboles are crocidolite, or blue asbestos; amosite, or brown asbestos because of its iron content; and anthophyllite. Another amphibole is fibrous tremolite, a contaminant found in many minerals. Brazil is now the fifth largest producer and consumer of asbestos in the world, after Russia, Canada, Kazakhstan, and China.[3] "There are large and profitable internal and export markets [and manufacturing] in Brazil, India, Thailand, Nigeria, Angola, Mexico, Uruguay, and Argentina."[3] Health care providers treating immigrant populations, especially from these countries, need to be aware that these people may have had occupational or environmental exposure to asbestos.

Asbestos was widely used in the U.S. from 1940 through 1970 in the manufacture of insulation and fireproofing materials, cement products, floor tiles, textiles, asbestos paper, and anti-friction materials.[4] Its durability and resistance to heat and friction led to many industrial, vehicular, and home uses. The highest exposures have occurred in the ship building industry. In 1995, "58% of the asbestos cases reported through the [CT] Worker' Compensation Commission and through [CT] Vital Statistics [were exposed] in the ship building industries."[2] In 1996-1997, most asbestos-related cases in Connecticut were from the construction and shipbuilding occupations, including pipefitters, plumbers, and welders.[5] "While exposures to asbestos have decreased over the past 30 years (due to banning of certain uses of asbestos, increased recognition of the hazard, and more stringent regulation), there remains some risk of exposure in the asbestos removal, demolition, and maintenance occupations."[4] Asbestos is still used in the manufacture of automotive brake linings and is still present in some buildings and homes constructed before 1980 across the United States.

Asbestosis & Asbestos-related diseases

Asbestosis is one of the pneumoconioses, a group of diseases caused by accumulation of mineral dusts in the lung tissue. It is a gradually progressive, diffuse interstitial fibrosis of the lung that results from complex

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The clinical review for occupational asthma, entitled "Clinical evaluation, management, and prevention of work-related asthma" is very comprehensive. The article defines work-related asthma, reviews the clinical presentations, provides a stepped approach to diagnosis, and discusses the management of work-related asthma.

The January issue of the *American Journal of Industrial Medicine* is available on the internet and can be accessed through the New York State Department of Health web site, www.health.state.ny.us/nysdoh/environ/occupate.htm, through December 31, 2001.

inflammatory and immune responses to inhaled asbestos fibers. Fiber size, intensity and duration of exposure, smoking history (including passive smoking), and individual susceptibility all play a role in the development of asbestosis. There is a dose-response relationship such that workers with higher exposures to asbestos are more likely to develop asbestosis. Women washing the asbestos laden clothes of relatives with asbestos exposure at work have developed asbestosis. Environmental asbestos exposure alone rarely causes pulmonary fibrosis. However, Magnani et al. did report a case of environmental asbestos exposure resulting in asbestosis.[6]

Occupational exposure history, medical history, clinical examination, pulmonary function testing and imaging studies are all essential to the diagnosis of asbestosis and all asbestos-related diseases. The worker with asbestosis may complain of a chronic dry cough and shortness of breath with exertion. Bibasilar crackles may be heard on auscultation of the posteriolateral thorax during mid to late inspiration that do not resolve with cough. Chest x-ray demonstrates "small, irregular or linear opacities throughout the lung but predominantly in the lower lung zones."[7] Pleural thickening or calcification, also called pleural plaques, is a marker for asbestos exposure but is not indicative of asbestosis or asbestos-related lung cancer. High-resolution CT scans are useful in detecting pleural disease. Restrictive lung disease may be found with pulmonary function testing (PFT) before the occurrence of asbestosis symptoms. Restrictive lung disease PFT changes may be combined with obstructive changes, especially in smokers. A DLCO (Diffusion in Lung of Carbon Monoxide) test result below normal is also characteristic of the disease. Once initiated, asbestosis may continue to progress despite removal from exposure. There is no known treatment for asbestosis. The most important intervention at the time of diagnosis is to motivate the patient to stop smoking. This may slow but not halt the progression of the disease.

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Lung cancer may follow asbestos exposure. How asbestos fibers cause lung cancer continues to be studied extensively. However, it is known that asbestosis is not necessary for the development of asbestos-related lung cancer.[6] Montizaan et al. reported in 1989 that asbestos-related lung cancer was probably caused by the interaction of the asbestos fiber and nuclear material in the cell, resulting in mutation.[8,9] Nelson et al. more recently reported that the prevalence of k-*ras* codon 12 mutation seen in lung adenocarcinoma tumors was higher in those with occupational asbestos exposure, with the intensity of exposure to asbestos and the time since initial exposure being the most important factors.[10]

There is a wide range of other malignancies related to asbestos exposure. These include pleural and peritoneal mesothelioma, laryngeal cancer, and gastrointestinal cancers such as esophageal, stomach, colon, and rectum. Asbestos fibers enter the gastrointestinal tract through ingestion and from swallowing fiber-laden phlegm cleared from the lung by the mucociliary escalator. Asbestos fibers may also travel to the peritoneum via the lymphatic system. Mesothelioma is almost exclusively due to asbestos exposure, even if the exposure was of short duration.

Conclusion

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The number of workers with asbestosis and asbestos-related diseases in CT is difficult to estimate. Data from CT Worker's Compensation Commission, CT OSHA's Census of Fatalities from Occupational Injuries (CFOI), Vital Statistics death certificates, the CT Tumor Registry, and DPH Occupational Disease Surveillance System provide a minimum estimation of the extent of asbestos-related diseases. There is little overlap of cases in these databases.

"Only a minority of physicians in the state actually report occupational lung disease…. Increased awareness and reporting of occupational disease, including more attention to the occupational histories, is needed to properly identify"[2] the true burden of asbestosis and asbestos related diseases in this state. Physicians are strongly encouraged to report cases of asbestosis, pleural plaques, asbestos-related lung cancer, and mesothelioma to the CT Departments of Labor and Public Health. For more information about reporting, call the DPH Occupational Health Program at 860-509-7744.

Summary of Number of Reported Cases of Selected Respiratory Diseases in CT*
CT DPH Occupational Disease Surveillance Data

	1996	1997	1998	1999	ODSS Total**
Asthma	39	27	19	23	195
RADS* **	7	4	7	5	32
Silicosis	0	1	3	1	13
Asbestosis	11	3	7	6	110
Asbestos-related pleural diseases	8	2	10	9	118
TOTAL	65	37	46	44	468

* As of February 29, 2000. Data subject to change.
** Occupational Disease Surveillance System (ODSS) total since 1/1990
*** Reactive Airways Dysfunction Syndrome

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