

Respiratory Tract Irritation from Fibrous Glass Inhalation

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Each year in California physicians report some 30,000 cases of occupational disease. Despite problems of under-reporting, incomplete reporting and, on occasions, inaccurate reporting, the sheer weight of 30,000 case reports, received from nearly as many physicians practicing in almost every part of California, cannot help but yield valuable clues to the understanding of occupational disease diagnosis.¹ Taken as a whole, the

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system comprises a great potential source of information about the relative importance of the various hazardous substances encountered in the workplace. Of perhaps even greater importance, the system offers a potential for uncovering exposure-effect relationships not previously identified as significant. One such relationship which recently became apparent is that of respiratory tract irritation from exposure to fibrous glass.

During the past several years, there have been a number of reports published which discuss the effects of fibrous glass²⁻⁵ upon the lungs. The authors of these reports have been primarily concerned with the possibility that inhalation of finely divided particles of fibrous glass may produce fibrotic pulmonary disease. The weight of evidence derived from these investigations seems to indicate that neither in the experimental animal nor in the occupationally-exposed worker is inhalation of fibrous glass particles likely to produce permanent lung changes.

Having no relevant information, the authors cannot comment upon the relationship between fibrous glass inhalation and pulmonary fibrosis or permanent pulmonary damage of any kind. Attention should be focused, however, on one health aspect of fibrous glass exposure which, although well-known among fibrous glass workers, has not been reported elsewhere, apparently having been obscured by scientific concern over more serious pulmonary disease. This problem is respiratory tract irritation which is sufficiently serious to compel the worker to seek medical attention, and is characterized by one or more of the following: bronchitis, rhinitis, sinusitis, pharyngitis, and/or laryngitis.

In California, during the period extending from January 1960 to June 1962, 691 cases of occupational disease were attributed to fibrous glass exposure. Of these, 38 were primarily problems of respiratory tract irritation; the remainder involved the effects of fibrous glass on the skin and eyes. These cases were summarized in an internal health department document, and the original reports discarded. During the interval between June 1962 and September 1967, no special summarization of reports of occupational disease attributed to fibrous glass exposure was compiled. The original reports received during this period have also been discarded. Remaining available for study are reports received from September 1967 through September 1968. During this 13-month period, 28 reports describing adverse respiratory reactions to fibrous glass were received. In all, then, 66 reports of respiratory tract irritation attributed to inhalation of fibrous glass were received during these two periods.

Among the 66 cases were eleven females and 55 males, ranging in age from 17 to 68 years. Occupational designations indicated that cases occurred primarily in individuals who worked directly with fibrous glass or fibrous-glass-bearing plastics, especially where a dusty

TABLE I
RESPIRATORY MANIFESTATIONS ATTRIBUTED TO
FIBROUS GLASS EXPOSURE
(A Summary of 66 Case reports)

	Times Reported	Total % Reports
Bronchitis ^(a)	42	64
Pharyngitis ^(b)	25	38
Rhinitis ^(c)	20	30
Asthma ^(d)	6	9
Laryngitis ^(e)	4	6
Sinusitis ^(f)	3	5
Nosebleed ^(g)	1	-

- (a) Bronchitis: reporting physician's diagnosis or patient complained of chest pain and trouble breathing.
 (b) Pharyngitis: reporting physician's diagnosis or patient complained of sore throat.
 (c) Rhinitis: reporting physician's diagnosis or patient complained of pain in nose.
 (d) Asthma: reporting physician's diagnosis.
 (e) Laryngitis: reporting physician's diagnosis.
 (f) Sinusitis: reporting physician's diagnosis.
 (g) Nosebleed: patient's description.

SOURCE: California Department of Public Health

operation such as cutting, sanding, or machining was involved. In addition, however, a number of case reports described individuals who merely worked in the general area where fibrous-glass-containing dust was being generated. Thus, it appears that working with the material is by no means the sole criterion of exposure.

On 19 of the 28 case reports received during the period of September 1967 through September 1968, a notation was included which indicated that a chest roentgenogram had been taken. This information on the 1960-1962 reports is not available. Of these 19 reports, 13 were accompanied by some statement of roentgenographic evaluation. These 13 included nine negative reports, one "bronchitis," and one "pulmonary fibrosis." The physician who reported this latter case expressed some doubt that the observed "pulmonary fibrosis" was related to the patient's fibrous glass exposure.

Table I summarizes the respiratory tract manifestations noted on the 66 reports.

Three of the 66 cases resulted from the same exposure, and were reported by a practicing occupational medicine specialist.

Case Reports

Case 1. This 48 year old male maintenance employee worked several 8-hour shifts, removing fibrous glass insulation from around a steam pipe. He wore no respiratory protective device, even though such equipment was available. His chief complaints were sore throat, congested nasal cavities, pain in the larynx, and skin irritation.

Physical examination revealed no ear, nose, or throat abnormalities, and the skin was clear. The chest x-ray was reported as

normal. The physician's impression was that there were minor irritations of the respiratory tract from fibrous glass dust. When the employee began to use the respiratory protective device provided, the respiratory irritation lessened, but the itching and irritation of the skin continued.

Case 2. This 27 year old male maintenance employee worked several 8-hour shifts without respiratory protection, removing fibrous glass insulation. His chief complaints were a cough and an inability to sleep because of itching.

The physician's examination revealed a slight injection of the pharynx. In addition, the nasal mucosa was red and crusted. There were slight rhonchi in the lungs, which cleared on coughing. A chest x-ray was reported as having prominent markings in the left lower lobe which were probably vascular and within the limits of normal. The employee's symptoms abated after he began wearing a respirator.

Case 3. This 34 year old male supervisor was in the area without respiratory protection, directing the removal of fibrous glass insulation, for three 8-hour shifts. When he came to the dispensary, his chief complaints were persistent throat irritation, cough, and a burning sensation in the throat. He reported a long history of sinusitis, allergic rhinitis, and asthmatic episodes occurring in the past as a result of ingestion of chocolates and other foods. There was no asthma attack with this work exposure.

The physician's examination revealed some rhonchi in the left lower lung field. A chest x-ray was interpreted as normal. The symptoms were gone the following day.

Conclusions

Although these reactions to fibrous glass do not, to our knowledge, result in permanent disability, the authors believe such reactions are nonetheless noteworthy because they indicate that fibrous glass is a substance which is fully capable of causing symptomatic respiratory irritation. Therefore, the following recommendations would seem to be in order:

1. Workers should be protected from respiratory exposure to airborne fibrous glass by accepted industrial hygiene practices. Reliance on filter-type respirators should be confined to brief exposure situations.
2. Further studies should be undertaken to define more clearly the health hazards associated with exposure to airborne, fibrous glass-plastic mixtures.

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