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Smoking and Alcohol Use in Asbestos Abatement Workers

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In most developed nations, asbestos is no longer commonly used as a result of its published health hazards. However, these minerals are still routinely used in many nations of the world (e.g. India) (Hoskins and Lange, 2004). Discontinuation gave rise to a new industry (asbestos abatement) that removes asbestos-containing materials (ACM) from buildings/structures (Health Effects Institute-Asbestos Research – HEI-AR, 1991). This industry has ten of thousands of workers in the US.

Little has been reported on the activities of these asbestos abatement workers. Current exposure data on these workers indicate that their level of exposure is overall low (Lange et al., 2006), generally below the US Occupational Safety and Health Administration Permissible Exposure Limit of 0.1 fibers per cubic centimeter (f/cc) (time weighted average - TWA) and well below the past exposure of workers involved with this material, which commonly exceeded 10 f/cc-TWA (Yarborough, 2006).

Previous studies (Lange et al., 1987; Lange, 1992) have suggested that this occupational population has a high smoking rate when compared to other occupational groups or the general population. It is well established that asbestos exposure causes various diseases and its risk increases (synergistic effect) with tobacco smoke for lung cancer (Hammond et al., 1979; HEI-AR, 1991) and possibly mesothelioma (Hirao et al., 2002).

This preliminary investigation collected data on smoking and alcohol use for asbestos abatement workers attending training classes. Only those reporting involvement in actual removal of ACM were included in the study results. Based on a review of the literature, this is the second report (Lange et al., 1993) on alcohol consumption in this occupational group.

MATERIALS AND METHODS

Information on various characteristics was collected during asbestos abatement worker/supervisor refresher training classes in western Pennsylvania. The survey included only workers whose activity involved removal of ACM (direct exposure), and did not include those not routinely exposed to airborne asbestos (e.g. management, air sampling, design).

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There was 100% participation. A total of 37 participants were surveyed, with 36 caucasian and 1 black, all male and US residents. The study time period was January - May, 2006. Participation was voluntary and survey forms were discarded after being recorded.

Collected data include: age (in years); sex; race; smoking status (never, former, current: <5, 5-10, 11-20, 20-40, >41 cigarettes/day); age at starting smoking; alcohol consumption (none, 1-2, 3-4, 5-6, >6 drinks/day – cans/bottles/tins of beers, glasses of wine, shots of liquor); frequency for alcohol use (1, 2, 3, 4, 5, 6, or 7 times a week); and length of time as an asbestos abatement worker (removing ACM).

Data on smoking and alcohol use are presented as arithmetic means (average) with categorization in two age groups (18-30 and 31-52 years). Smoking consumption was categorized as 20 cigarettes or less per day (one pack) and over 21 cigarettes per day. Frequency of alcohol consumption (drinking) was categorized as none, 1 to 3, and 4 to 7 times/week; those reporting consumption were further categorized as 1 to 4 and 5 or greater drinks/day, when consuming. Study methods were similar to that previously reported (Lange, 1992; Lange et al., 1993).

RESULTS AND DISCUSSION

This population was employed in the abatement industry for an average of 4.7 years (range 1-24 years). In western Pennsylvania, the regulated abatement industry began in the mid 1980's, with the first formal training courses conducted around 1987 (Lange et al., 1987). Since the average length of employment is not long, this suggests that there is a high turn-over in this occupational population.

The average age of all workers, smokers, former smoker and non-smokers was 34.4, 30.2, 39.3 and 35.0, respectively. These age values, although a small population, are similar to that reported in other studies, where for all workers the average age was about 33 (Lange, 1992; Lange et al., 1993).

In this population, 78.4 % were smokers, 10.8% former smokers and 10.8% non-smokers. In previous studies of asbestos abatement workers that included those not removing ACM, percent of smokers was around 50% (50.2% – Lange, 1992 and 57.6% - Lange et al., 1993).

For current and former smokers the average starting age was 16.8 and 21.5, respectively. One current smoker started at age 39 and if this value is not included the average age becomes 16.1, similar to that previously reported (16.2) (Lange, 1992). In a previous investigation (Lange et al., 1993), the number of cigarettes consumed by current smokers was low, generally less than one pack; however, this was not observed in an earlier study, where about half smoked a pack or less a day (Lange, 1992).

Distribution of smoking and alcohol consumption is shown in tables 1 and 2. The cut point used in dividing the population into two age groups is the average age of smokers (about 30 years).

There does not appear to be any change in the smoking rate between data collected in this survey and that of the previous investigations, the first in 1987 (Lange et al., 1987; Lange and Thomulka, 2003). When compared to other occupational groups and the general population in the US, asbestos abatement workers have the highest smoking rate of any identifiable group (industry or occupation) (Lange and Thomulka, 2003). These rates are higher than that reported for construction workers (41.9%) by Bang and Kim (2001) for the time period 1988-1994, which historically has one of the highest smoking rates. However, construction workers have experienced a reduction in the smoking rate, from 49.9% reported in a survey conducted from 1978-1980 (Brackbill et al., 1988). This indicates that a reduction can be achieved in these occupational populations. In the US general population, the percent of male smokers was 23.3 in 2000 (Centers for Disease Control and Prevention - CDC, 2002), and 28.8% in 1987, (CDC, 1987), indicating a reduction over time is occurring.

Although most asbestos workers today are not exposed to elevated levels of airborne asbestos (Lange et al., 2005; 2006), the high percent of smokers places this group at increased risk of smoking related diseases (e.g. emphysema, lung cancer) (Bagatin et al., 2005). Due to the high number of smokers, exposure to environmental tobacco smoke can also be considered a risk for non-smokers in this group. Risks in this group are also likely increased in that they often perform related industrial work, such as lead abatement, demolition and hazardous waste removal; thus, having exposure to numerous types of chemicals/substances.

Since most asbestos used today is of the chrysotile mineralogical form, and this category has been reported to have little if any ability to cause cancer and fibrosis (Yarborough, 2006; Bernstein and Hoskins, 2006), the major chronic hazard for this group is tobacco consumption. Although the exposure levels to asbestos are low, the synergistic effect with asbestos and smoking must also be considered (HEI-AR, 1991).

Overall, this population had a low consumption of alcohol. About half of those surveyed (49%) did not consume alcohol. In a previous study of alcohol consumption, about 28% did not consume alcohol. This suggests that these workers may be at lower risk for alcohol related diseases.

Asbestos abatement workers, in general, tend to be a relatively young population, which is mostly a result of the physical demands associated with this occupation (Lange, 1992). Abatement workers can be characterized as "risk takers", which is a result of the young age and their social economic group. Even though this population receives instruction on hazards with work and smoking, based on information collected in past studies (Lange et al., 1987) there has been no change in the rate.

Table 1. Number (percent of total) of current smokers by cigarette consumption in an asbestos abatement class

Age group (years)	Number of cigarettes/day	
	20 or less	greater than 20
18-30	15 (51)	0 (0)
31-52	13 (45)	1 (4)
Total	28 (96)	1 (4)

Table 2. Number (percent of total) of non-drinkers by age, and drinkers by age, frequency and consumption of alcohol, in an asbestos abatement class

Age Group (years)	None	1-3 times/week		4-7 times/week	
		1-4 drinks/day	>5	1-4 drinks/day	>5
18-30	9 (24)	8 (22)	1 (3)	0	0
31-52	9 (24)	8 (22)	1 (3)	1 (3)	0
Total	18 (48)	16 (44)	2 (6)	1 (3)	0

This indicates that these efforts had no effect in reducing smoking rates. Alternative approaches are needed to reduce smoking in this group, with a suggestion that such measure begin before the age of 16.

This study included only "Americans", while in the US many of the abatement workers today are foreigners, mostly illegal workers. These workers often take the course in their native language (e.g. Spanish) and are an unidentified risk group in this occupation. It is unknown if these workers have the same habits reported here and elsewhere (Lange et al., 1987). The large population of illegal asbestos workers in the US constitutes an occupational group for which there is little or no known information.

Asbestos abatement workers as an identifiable occupational group have one of the highest smoking rates, if not the highest (Lange et al., 2004). Since the latency period of asbestos and smoking related disease is long, impact to this population will probably not been seen for another 10 years, using a mean age for this population of around 30. Future diseases in this population will likely be related to their consumption of tobacco and not asbestos. However, since some diseases like lung cancer exist for both, separation may be difficult; although, information on smoking will allow an estimation of risk as related to this habit. As abatement of ACM expands from highly developed countries (Dobrovolsky, 1998), additional efforts are needed in reducing the smoking rate in this population; the fact has not been commonly recognized by regulatory and health agencies.

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