



Epidemiological Studies in Spray Painters

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A relationship between the environment of working place of spray painters and the related health problems has been studied. Forty four adult male Spray painters and 45 male workers (denters and mechanics) all working in three automobile workshops were interviewed with the help of a predesigned questionnaire. Spray painters showed higher percentage of health problems than the other workers. Forty one (93%) out of 44 spray painters had the respiratory problems of which about 71% had the problem of throat burning, 59% suffered with breathlessness, 42(95%) had musculo-skeletal problems and 34 suffered with skin problems. Our findings confirm that spray painting is an occupation which involves the risk of respiratory impairment, work related asthma, musculo-skeletal and skin problems.

Key words: Spray painters, Respiratory problems, Musculo-skeletal problems, Skin problems.

Introduction : Hazardous substances used in spray paint include paints, solvents, powders, acrylic lacquers, enamel, paint removers, resins, adhesives, surface preparation products, rust converters, rust removers, and pigment components like lead, cadmium and chromium. Polyurethane paints containing isocyanate hardeners were introduced in the automobile refinishing market in the late 1960s to provide resistance to weather and sun light, and came into wide use since 1980s (Sparer et al, 2004). Isocyanates as paint ingredients have been found to cause respiratory impairment (Minov et al, 2008).

Toxic substances used in spray paints may be inhaled, involuntarily swallowed or absorbed through the skin and eyes. Their potential health and safety risks range from short-term effects such as irritation, contact dermatitis, headache, and nausea to extremely serious conditions such as lung cancer, damage to reproductive system, kidney or liver and painter's syndrome (which affects the brain). Chronic inhalation of chromium compounds may cause allergic asthmatic reaction, ulceration in the mucous membrane, perforation of nasal septum and bronchial carcinoma (Langard and Norseth, 1986). Many of the compounds present in the paints are known to be neurotoxic (NIOSH, 1987). Chronic exposure to air borne cadmium can cause obstructive lung disease and possibly lung cancer (Waalkes et al, 2001). The effects of hazardous

substances present in the paint on spray painters have not been studied in detail so far in Patna. We intended to compare the health status of spray painters with that of other workers all employed in the same automobile garages.

Methods :

The study was conducted in three workshops of Patna namely: City Autoservice in Patliputra, City Autoservice in Alpana market and Tirupati Automobile Services, Ashiana More. These workshops had separate working areas for painters, denters and mechanics. Forty four spray painters and 45 workers (other than spray painters) at the above mentioned automobile workshops were interviewed with the help of standard predesigned questionnaire which included details about their age, duration of service, number of working hours, health problems and addiction if any.

Results :

It was found that spray painters (Table -1) suffered with problems associated with their skin, eye, gastrointestinal tract, musculo-skeletal, respiratory, neurobehavioral, nervous systems. A number of respiratory problems was found among the spray painters. It was evident that the spray painters faced more health problems than the workers in other parts of the garage. Table 2 shows the agewise occurrence of

health problems in spray painters. It was seen that percentage of occurrence of health problems in spray painters increased with age. Table 3 shows the health problems of spray painters in relation to duration of their service. It was found that the percentage of occurrence of health problems increased with increase in duration of service.

Table 1. Comparative information on the health of study subjects.

Health Problems	Spray painters (N=44)	Denters (N=15)	Mechanics (N=30)
Skin (dermatitis)	34	01	01
Eye	34	04	06
Gastrointestinal	30	06	14
Musculo-skeletal	42	04	18
Respiratory	41	02	02
Neurobehavioural	17	00	06
Nervous system	31	06	12

Table 2. Agewise occurrence of health problems among spray painters (N=44)

Health Problem	Age 18-30 yrs. N = 19	Age 31-42 yrs. N = 17	Age 43-55 yrs. N = 08
Skin problem	17(89%)	16(94%)	08(100%)
Respiratory problem	10(53%)	16(94%)	08(100%)
Musculo-skeletal problem	17(89%)	17(100%)	08(100%)
Nervous system problem	13(68%)	12(71%)	06(75%)

Table 3. Health problems of spray painters in relation to their duration of service (N = 44)

Health Problems	Duration of service age 18m-11yrs. N =22	Duration of Service age 12-23 yrs. N =17	Duration of Service age 24-35yrs. N =05
Skin problem	15(68%)	17(100%)	05(100%)
Respiratory problem	21(95%)	15(88%)	05(100%)
Musculo-skeletal problem	20(91%)	17(100%)	05(100%)
Nervous system problem	16(73%)	12(71%)	04(80%)

Discussion :

The study reveals that spray painters were found to be more susceptible to various health problems as compared to the other workers in the same workshop. Vitayavirasuk et al (2005) also found that frequently occurring symptoms experienced by spray painters were those associated with digestive, respiratory, nervous and musculo-skeletal systems.

Most common health problems faced by spray painters included respiratory and musculo-skeletal problems. The organic solvents present in the spray paints can illicit respiratory injuries by acting as nonspecific irritants or by stimulating immune mediated mechanism (Gordon and Chiang, 2003). Pronk et al (2007) demonstrated exposure response relationships for respiratory symptoms and sensitization in a population of spray painters. Although 41 (88.6%) of spray painters faced respiratory problems, only one was diagnosed of asthma. The risk of asthma attributable to occupational exposures is probably underappreciated due to underreporting and to inappropriate use of narrow definitions of exposure in epidemiological studies of attributable risk (Christopher and Donald, 1999).

Forty two (93%) of spray painters suffered from musculo-skeletal problems. Omdal et al (1986) postulated a link between solvent exposure and inflammatory joint diseases. Lundberg et al (1994) also reported that spray painters and lacquer workers were at increased risk for rheumatoid arthritis.

Thirty four spray painters suffered from skin allergies. Hogberg et al (1978) studied skin diseases among house painters and found that occupational dermatoses were prevalent among them. Chloracetamide found in paint was found to be important cause of occupational contact eczema. We found that 34 out of 44 spray painters had eye problems such as eye watering, redness, itching, hypermetropia and myopia. Randolph et al (1997) also found in their study that a high proportion of spray painters had eye irritation (55%) and dermatitis of hand (32%).

The spray painters also complained of neurobehavioural problems such as unconsciousness, irritability and reduced attention span. Similar problems have been reported by Lee et al (2005) who studied neurobehavioural changes in shipyard painters in

Korea. Zaidi et al (2006) also reported that spray painters develop neurobehavioural , thyroid and reproductive problems.

Conclusion :

Our findings confirm that spray painting is an occupation which involves greater risk of respiratory impairment and work related asthma. The chemicals present in paints may cause a great threat to the health of the spray painters. Therefore, there is a need of regular medical examination and implementation of appropriate measures to prevent adverse respiratory effects of workplace exposure in automobile spray painters.

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