

Systematic Sclerosis Due to Solvent Exposure

Occupational Hazards that Trigger Progressive Systemic Sclerosis Progressive Systemic Sclerosis (PSS), or Systemic Scleroderma (SS), is a relatively rare connective tissue disease that can affect both genders, however it appears three to four times more often in women than in men (Ignatavicius and Workman, 2002, p. 356). Research has recognized that the cause of this disease is strongly linked to a combination of genetic factors, hormonal events, and external triggers within each client (International Scleroderma Network, 2004). PSS is quite similar to systemic lupus erythematosus, as both are autoimmune diseases that are believed to be triggered by an exogenous stimulus (Mayes, 1986, p.743). Since 1993, the Industrial Disease Standards Panel in Ontario, Canada, has been successfully acknowledging this disease as a result of environmental hazards within the workplace (Workers' Compensation Board, 1993, p.1). Specifically, occupational silica exposure has been one of many identified hazards that are directly related to PSS, and there are probably many more (Gordon, 1992, p.5). Many subjected clients present clinically with localized Scleroderma, which is often characterized by a hardening or tightening of the outer skin that becomes inflamed, swollen, and hardened. However, this is only one possible manifestation of the disease. Since PSS is also a 'Systemic' disease, both outer and inner connective tissues of the body are subjected to the disease process. As the disease progresses, the inflamed connective tissue within many vital organs undergo fibrotic and sclerotic changes. Over variable periods of time, these ongoing

systemic changes become characterized by a hardening of the tissues surrounding one's organs, such as the heart, kidneys, lungs and/or throat. The end result is the long-term chronic suffering of the exposed worker, and eventual death resulting from the adverse sclerotic changes to these selected vital organs. Using a case presentation of an occupationally exposed client, this article intends to further support employees with Systemic Scleroderma and the pursuit of compensation for their work related injury.

Occupational Hazards Trigger Progressive Systemic Sclerosis

A 63-year-old woman was referred by her union to the Occupational Health Clinic for Ontario Workers, regarding her diagnosis of scleroderma and work relatedness. She related an onset of symptoms dating back about 10 – 12 years when she started having difficulties with swelling and choking. She was diagnosed with esophageal stricture at that time and underwent esophageal dilatations. Her doctor at the time questioned whether or not scleroderma was present but no specific diagnosis was made. In addition she started to note the presence of Raynaud's phenomenon involving the upper and lower extremities. She then started to note tightening of the skin of her hands and lower extremities, in particular, the shin area. A diagnosis of progressive systemic sclerosis (scleroderma) was made in 1995 and she then noted progressive exertional dyspnea with eventual diagnosis of pulmonary fibrosis. She subsequently went on to develop pulmonary hypertension. She worked for an automotive parts manufacturer starting in 1965 and retiring in 1986. She worked in the

sewing department utilizing two sewing machine lubricants. One silicone lubricant contained 1,1,1 trichloroethane (methyl chloroform), N-butane and propane. The lubricants were sprayed several times per day on the tables to reduce friction and allow material to slide on the table. She reported using a 12-ounce aerosol can of this spray each week. Her co-workers would also use it. She was also exposed to a fabric cleaner that was used as a spot remover for the fabric. The fabric cleaner contained a blend of naphthenes, paraffins, aromatics, tetrachloroethylene and 1,1,1 trichloroethane (methyl chloroform). Solvents have been implicated as a causal factor for the development of systemic sclerosis since 1957 when Rainl (Zentralbl Arbeitsmad, 1957) reported a 24-year-old woman developing diffuse systemic sclerosis after degreasing aluminum parts containing trichloroethylene. A literature review was done which revealed strong evidence in the literature with respect to an association of trichloroethylene and development of scleroderma. Nietart (Arthritis and Rheumatism, June 1998) obtained occupational histories from 178 systemic sclerosis patients and 200 controls. The OR was 3.3 for Trichloroethylene exposure. A Workplace Safety and Insurance Board (WSIB) claim was filed for scleroderma with occupational exposure to solvents. The Occupational Medical Disease Department at WSIB reviewed the case and concluded that the available literature supports a causal association between occupational exposure to organic solvents and the development of scleroderma with the most frequent organic solvents being aromatic hydrocarbons such as petroleum solvent,

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halogenated hydrocarbons such as trichloroethylene and trichloroethane.

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References

Gordon, D.A. (March, 1992). The relationship of occupational silica exposure to systemic sclerosis or scleroderma. *Industrial Disease Standards Panel (IDSP) Report*. University of Toronto, 1 –20.

Ignatavicius, D. and Workman, M. (2002). *Medical Surgical Nursing*. Toronto: Moseby, P. 356.

International Scleroderma Network. (2004). *What causes Scleroderma?* Retrieved online January 14, 2004, from <http://www.sclero.org/medical/research/causes/a-to-z.html>

Mayes, M. (1999). Epidemiologic studies of environmental agents and systemic autoimmune diseases. *Environmental Health Perspectives*, 107(5), 743.

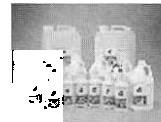
Workers' Compensation Board. (1993). Scleroderma policy adopted. *Policy Report*, 6(4), p.1.

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