

Diffused systemic sclerosis due to occupational solvent exposure

Gh-hossein Alishiri · Amin Saburi ·
Noushin Bayat · Ehsan Saburi

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To the Editors,

Systemic sclerosis (SSc) is an uncommon autoimmune disorder of the connective tissue, discriminated by skin fibrosis, vascular dysfunction and gastrointestinal tract, lungs, and kidneys involvement [1]. The prevalence range is estimated between 50 and 300 cases per 1 million persons [2]. Its pathogenesis is apparently multi-factorial such as intrinsic and extrinsic factors. Similar to other autoimmune disorder, in SSc also some biologic (such as cytomegalovirus (CMV)) and non-biologic agents (such as specific chemical toxins) can trigger the immunologic cascade in susceptible hosts. Environmental and occupational agents one of the extrinsic triggering factors that may play essential and developing role in SSc. Several case reports and series informed that various solvents (organic or non-organic) are associated with limited form of SSc but its diffused form was very rare [3–9]. Benzene, toluene, xylene, trichloroethane, trichloroethylene, perchloroethylene, VM & P naphtha, and mineral spirits are some of the most famous solvents that were identified in relation to SSc [3].

We report a case of SSc in a patient working in the chemical manufacture industry where he was exposed to different solvents. A 49-year-old male patient was referred to Baqiyatallah Hospital (Tehran, Iran) complaining of hands' skin discoloration, thickness, and hardenings and arthralgia in whole of PIP and MCP joints which have been progressed since 5 months ago. Recently, tiny ulcer on hand fingers' tip was emerged. Also, he was affected by exertional dyspnea, gastro-esophageal reflux (GER), and morning stiffness with 45 min duration. Physical examination revealed Reynolds phenomenon in whole hand fingers, especially bilateral third and fourth finger. Laboratory findings showed elevated ESR level and white blood cell count, while rheumatoid factor (RF), anti-nuclear antibody (ANA), plasma creatinine level, and other findings were not remarkable. Lung computed tomography (CT scan) showed subpleural fibrotic changes in both lungs. He had worked in chemical manufactory appointed to a duty where he was to deal with several organic solvents derived from benzene since 2 years ago. An environmental chemical mixtures investigation was performed within the factory, supplemented by a quantitative meteorological assessment to estimate the average level of exposure to different solvents. The levels of dimethylbenzene, xylene, trimethylbenzene, and naphthalene were found to be several times higher than the standard at the place. Demographic, clinical, and laboratory findings were compatible with diffused form of SSc due to occupational exposure to benzene derivate solvents. The patient exposure was cut off and treatment was started with methyl prednisolone, pentoxifylline, aspirin, methotrexate, and supportive medication. The therapeutic response after 6 months was favorable. GER and Skin ulcers healed, and skin thickening and pulmonary changes did not progress.

G. Alishiri · N. Bayat
Department of Rheumatology, Baqiyatallah University
of Medical Sciences, Tehran, IR, Iran

A. Saburi (✉)
Health Research Center, Baqiyatallah University
of Medical Sciences, Tehran, IR, Iran
e-mail: aminsaburi@yahoo.com

E. Saburi
Department of Laboratory Medicine, Shahid Beheshti University
of Medical Sciences, Tehran, IR, Iran

Conclusion

Considering cases of SSc in individuals occupationally exposed to solvents suggest that environmental agents apparently have a role in the pathophysiology of this disease. Benzene and its derivatives have been incriminated previously in the literature as a cause of this illness. In fact, the excitation of SSc by solvents is biologically acceptable, and it could include an immunological process, maybe through alteration of cellular proteins by solvents [4, 5].

The aim is to conclude occupational SSc due to prolonged exposure to benzene derivatives widely used in industry and implicated in the etiology of our patient's disease, and we recommend a possible preventive scheme, and the worker must be observing closely. Skin contact with organic solvents could be a patient predisposing factor for systemic sclerosis and it must be avoided.

Conflict of interest None.

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