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DEVELOPMENT OF WELDING FUME INDUCED LUNG FIBROSIS MODEL IN SPRAGUE DAWLEY RATS

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To investigate the disease and recovery process of pneumoconiosis induced by welding-fume exposure, a lung fibrosis model was established by building a stainless steel arc welding fume generation system and exposing male Sprague-Dawley rats for 90 days. After rats were exposed to welding fumes with concentrations of 63.6 ± 4.1 mg/m3 (low dose) and 107.1± 6.3 mg/m3 (high dose) total suspended particulates for 2 h per day in an inhalation chamber for 90 days, thereafter the exposure was stopped, and the rats were allowed to recover from the welding fume induced lung fibrosis for 90 days. When compared to the control group, the lung weights did not increase significantly in the low-dose group, yet in the high-dose group there was a significant increase from day 15 to day 90. The histopatholgical examination combined with fibrosis specific staining indicated that the lungs in the low-dose group did not exhibit any progressive fibrotic changes. Whereas, the lungs in the high dose group exhibited early delicate fibrosis from day 15, which progressed in to the perivascular and peribronchiolar regions by day 30. Interstitial fibrosis appeared at day 60 and became prominent by day 90, along with additional appearance of pleural fibrosis. The recovery evaluated by body weight and histopathological examination was noted from the rats in both high and low dose group that had been exposed up to 30 days. Although the 60-day low-dose exposed rats recovered from the fibrosis, the 60-day high-dose and 90-day low and high-dose exposed rats could not recover fully from the fibrosis. Taken together, the pneumoconiosis induced by welding-fume exposure could be recovered if the degree of exposure was moderate.

keyword : welding fume, fibrosis, rat,