

Study on the Occupational Exposure and Health Concern of Dental Technicians

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Abstract

Methyl methacrylate (MMA) monomer and polymer are extensively used in medical treatment. Their use in the field of dentistry include ceramics adhesive filling and plastic denture. Dental technicians who regularly use this resin often complain of numbness, paresthesia, and pain in the hands. The aim of this study is to clarify the neurotoxic effects of MMA in dental technicians. This study randomly chose 40 workers responsible for handling MMA resin from 9 tooth mold firms as research subjects. Questionnaires, health examinations, and workplace measurements were performed. The results of the workplace measurements are as follows: Average of MMA vapor concentration, 11.33ppm; geomean of total aerosol concentration, 0.11 mg/m³; geomean of respirable aerosol concentration, 0.01 mg/m³; instant maximum sound level for air cutter, 112.3dBA; instant maximum sound level for metal grinder, 89.7 dBA; daily noise dose is 53.8%; 8-hour time-weighted-average sound level is 85.5 dBA. All are below the current standards specified by the law. WAS (weighted acceleration sum) value of hand-arm vibration for metal ground is 2.72 m/s². We recruited 40 dental technicians for detailed history review, neurological examination, and nerve conduction velocity study. The clinical signs study results show 7 workers, (23.3%) experience low deep tendon reflex and 3 (10.0%) have sense abnormality at the limbs ends. No muscle lacking strength is found. It is therefore summarized that workers handling MMA mostly demonstrate the sign of sense nerve damage. The results of nerve conduction study show that 34.2% of the worker have distal latency abnormality. The results of exam of sensory system show that amplitude drop account for most abnormality cases, 26.3%. For worker handling MMA, nerve conduction velocity study is a non-obtrusive and objective exam that is capable of detecting disease of peripheral nervous system in its early stage, and might be used as an indicator for health surveillance. The dental technicians exposed to MMA may develop sensory motor peripheral neuropathy. The nerve conduction velocity study provides an objective and non-invasive method to detect the early peripheral nervous dysfunction caused by MMA.

Key words : methyl methacrylate, dental technicians, aerosols, noise, nerve conduction velocity study

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