

Sindrome da vibrazioni mano-braccio e patologie degli arti superiori correlate con il lavoro forestale

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KEY WORDS

Ergonomic risk factors; forestry work; hand-arm vibration syndrome; mechanical vibration; upper-limb musculo-skeletal disorders

SUMMARY

«Hand-arm vibration syndrome and soft-tissue disorders of the upper limbs in forestry workers». Background: Occupational exposure to hand-transmitted vibration in forestry workers is associated with an increased risk for vascular, neurological and musculo-skeletal disorders of the upper limbs. Objectives: To carry out a cross-sectional study of the hand-arm vibration syndrome and soft-tissue disorders of the upper limb in a group of forestry workers employed in the Forestry Service of the Province of Trento (Italy). In the forestry worker group, usage of anti-vibration chain-saws was intermittent over a typical work year (16 weeks/yr, on average). Methods: To investigate vascular, neurological and musculo-skeletal disorders of the upper limbs, the forestry workers (n=159) and a control group of manual workers, unexposed to hand-transmitted vibration, employed in the same Forestry Service (n=146) underwent a structured medical interview and a complete physical examination. The clinical diagnoses of vibration-induced white finger (VWF) and carpal tunnel syndrome were made according to internationally recognised consensus criteria. Occupational exposure to hand-transmitted vibration was assessed according to the recommendations of the International Standard ISO 5349-1 (2001). Results: The forestry workers showed an increased prevalence of peripheral sensory-neural disturbances (33.3%), musculo-skeletal disorders of the upper limbs (37.7%), and carpal tunnel syndrome (21.4%) compared to those observed in the control group. There was no significant difference in the prevalence of Raynaud's phenomenon between the forestry workers (6.3%) and the controls (4.1%). After adjustment for confounding factors (age, body mass index, tobacco and alcohol consumption), a significant association was observed between peripheral neuropathies (peripheral sensory-neural disorders, carpal tunnel syndrome) and several indices of vibration exposure such as 8-hr energy-equivalent frequency-weighted acceleration [$A(8)$ in m/s^2 r.m.s.], duration of exposure (years), and lifetime vibration dose (m^2/s^2 hr). An excess, although not significant, risk for VWF was observed only in the forestry workers with $A(8) \geq 4 m/s^2$ r.m.s. In the forestry workers, there was no significant association between VWF and sensory-neural disorders, and between VWF and carpal tunnel syndrome. This finding seems to support the hypothesis that the vascular and neurological components of the hand-arm vibration syndrome develop independently of each other. Within the forestry worker group, the variable "years of tool usage" showed the strongest association with peripheral sensory-neural symptoms, carpal tunnel syndrome, and soft-tissue disorders of the upper limbs. It is likely that in the forestry workers the variable "years of tool usage" represents an overall index of duration of exposure to several adverse ergonomic and mechanical risk factors. Conclusions: The

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results of this study suggest a tendency for a decrease in the occurrence of VWF among forestry workers, and this finding seems to be associated with the use of anti-vibration chain saws, the reduction of exposure duration, and the improvement of work organization. On the other hand, the forestry workers showed an increase in the occurrence of peripheral sensory neuropathies, carpal tunnel syndrome, and upper-extremity musculo-skeletal disorders. This finding seems to support the view that there is epidemiological evidence for a positive association between exposure to a combination of risk factors (segmental vibration, forcefulness, awkward posture) and the occurrence of soft-tissue disorders of the upper limb in working populations.