

Study on Effects of Shoch-Type Vibration on Peripheral Circulation in the Hand-Arm

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1993 Fiscal Year Final Research Report Summary

Study on Effects of Shoch-Type Vibration on Peripheral Circulation in the Hand-Arm

Research Project

Project/Area Number

04454222

Research Category

Grant-in-Aid for General Scientific Research (B)

Allocation Type

Single-year Grants

Research Field

公衆衛生学

Research Institution

Kanazawa University

Principal Investigator

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Project Period (FY)

1992 – 1993

Keywords

Vibration / Impulsiveness / Blood flow / Peripheral circulation / Grasping / ISO / Crest factor / Pneumatic tools

Research Abstract

Although deteriorating effects of shock-type vibration on hand-arm have been pointed out, the international standard for hand-arm vibration exposure have not provided available information on shock-type vibration. Waves produced by the normal use of chain-saw, pneumatic hammer, pneumatic riveting hammer, and pneumatic nailer at workplaces was recorded and analyzed. The order of the size in the impulsiveness, crest factor (CF) was

chain-saw, pneumatic hammer, pneumatic riveting hammer, and pneumatic nailer at a constant frequency-weighted rms acceleration at x direction (a_{xhw}) of 6.3 m/s^2 . No statistically significant effects of shock was recognized in comparisons of subjective response to shock-type vibration with that to shockless vibration of chain-saw. Effects of shock on peripheral circulation was examined by monitoring finger skin blood flow induced by the shock-type vibration at a constant frequency-weighted rms acceleration at x direction (a_{xhw}) of 6.3 m/s^2 . In a result, pneumatic nailer with the CF of 9.5 produced significant decreases in the blood flow at 4 and 5 min after the exposure. This result suggests that effects of vibration should be assessed including the size of the impulsiveness. Experiments examining effects of hand-grasping showed significant reduction in peripheral blood flow associated with the grasping. Tools with measures which protect vibration from transmitting into hand-arm easily with the growth of grasping force should be developed in future.

Research Products (6 results)

		All	Other
		All	Publications (6 results)
[Publications] Masami Yoshida,Hiroyuki Nakamura and Akira Okada: "Responses of plasma platelet-derived growth factor (PDGF) and endothelin to vibration exposure in chain-sawyers" NIOH Journal. (in print).			▼
[Publications] Hiroyuki Nakamura and Akira Okada: "Combined effects of hand-arm vibration and hand-grasping on local blood flow and plasma indicators" Arch.Complex Environ.Study.(in print).			▼
[Publications] Hiroyuki Nakamura and Akira Okada: "Comparisons of responses of plasma PDGF,tPA and endothelin to hand-arm vibration exposure between healthy and VWF workers" Proceeding of 6th International Conference on the Combined Effects of Environmental Factors. (in print).			▼
[Publications] Masami Yoshida, Hiroyuki Nakamura and Akira Okada: "Responses of plasma platelet-derived growth factor (PDGF) and endothelin to vibration exposure in chain-sawyers" NIOH Journal. (in print).			▼
[Publications] Hiroyuki Nakamura and Akira Okada: "Combined effects of hand-arm vibration and hand-grasping on local blood flow and plasma indicators" Arch.Complex Environ.Study. (in print).			▼
[Publications] Hiroyuki Nakamura and Akira Okada: "Comparisons of responses of plasma PDGF,tPA and endothelin to hand-arm vibration exposure between healthy and VWF workers" Proceeding 6th ICCEF. (in print).			▼

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