

Exploring Cold Sensitivity Among Workers with Hand-Arm Vibration Syndrome (HAVS)

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The Issue:

- Previous research on functional impairments in workers with vibration exposures has focused on the upper extremities (hands).
- Little is known about lower extremity (feet) impairments in workers with hand arm vibration syndrome (HAVS).

Study Objective:

To examine the severity and factors associated with cold intolerance and sensitivity in the hands and feet of workers with HAVS among a cross section of workers being assessed at the Occupational Medicine Clinic at St Michael's Hospital (SMH Clinic).

Methods:

- Patients assessed for HAVS in the SMH Clinic completed a Cold Intolerance Symptom Severity questionnaire (CISS) and other validated health surveys and screening tools e.g., QuickDASH, SF-12.
- Other information collected included demographics, smoking history and clinical measures e.g., plethysmography scores of hands and feet, and Stockholm vascular scale scores to measure functional impairments.
- Basic descriptive statistics and bivariate relationships between CISS scores in upper and lower extremities were explored. Further, multivariable models were used to identify key predictors of upper and lower extremity CISS total scores.

Results:

- There were 93 participants, all male with a mean age of 48 years.
- The majority worked in mining (63%) and construction (31%).
- Blanching extending beyond the fingertips was found in the hands of 55% of participants.
- Most CISS question scores indicated cold intolerance and sensitivity in the feet, which correlated with these symptoms in the hands. However, the hands were more severely affected than the feet.
- QuickDASH and Stockholm vascular scale scores positively predicted upper extremity CISS total scores (both $p < 0.001$). These findings were consistent with hand cold sensitivity being associated with the amount of vibration damage in the upper extremities.
- Exposure to foot vibration ($p < 0.001$), plethysmography scores of the feet ($p = 0.006$), and QuickDASH scores ($p = 0.016$) positively predicted lower extremity CISS total scores.
- These findings suggest that feet cold sensitivity is due to both foot-transmitted vibration and damage to the hands (possibly by release of systemic vascular mediators).

Conclusions:

- Cold intolerance and sensitivity are present in hands and feet of workers with HAVS.
- Clinicians should treat cold intolerance and sensitivity in both the hands and feet to improve workers' daily functioning.

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