

Effective methods for detecting early signs of tremor

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Sensitive new quantitative methods could be used to detect small signs of increased tremor and impaired motor skills caused by exposure to certain metals, and to follow up the treatment of neurological disorders, reveals a thesis from the University of Gothenburg, Sweden.

"The aim was to investigate whether quantitative measurement methods, in other words sensitive computer-based methods, could be used to detect small changes in tremor or other motor functions resulting from exposure to low levels of neurotoxic metals," says Gunilla Wastensson, doctoral student at the Sahlgrenska Academy's Occupational and Environmental Medicine Unit.

The thesis looked at former welders from the Gothenburg shipyards, who had been exposed to manganese from welding fumes. When tested for fine motor skills – in other words manual dexterity and motor speed – the welders came out worse than other shipyard workers.

"We interpret this as a residual effect of manganese exposure from the welding fumes, even though they'd stopped welding 18 years ago on average," says Wastensson.

A second study looked into whether quantitative measurement methods can be used to follow up the treatment of certain neurological disorders, such as essential tremor, which is a common neurological complaint where individuals are affected by involuntary shaking of the hands.

"Some essential tremor patients have such shaky hands that they find it hard to manage day-to-day activities," says Wastensson. "Such cases can be treated with a neurosurgical intervention known as deep brain stimulation."

For optimum effect, the stimulator must be programmed, which takes time and requires specially trained staff. Essential tremor patients treated with deep brain stimulation were both examined by an experienced neurologist who estimated the degree of tremor on a scale of 0 to 4, and assessed using quantitative measurement methods. The effect of the stimulation was very prominent, and the quantitative measurement methods were slightly more sensitive at detecting changes, particularly where the tremor was less pronounced.

"The results show that quantitative measurement methods are more sensitive than clinical assessments, and that they can be used to detect small changes in tremor or other motor functions caused by neurotoxic metals," says Wastensson.

She also believes that quantitative measurement methods could be used to complement clinical assessments when determining the impact of treatments for various neurological disorders.

METAL POISONING

It has long been known that metals such as mercury and manganese can damage the nervous system. Descriptions of the typical symptoms of mercury poisoning can be found as far back as the 16th century for hatters in the UK who used mercury nitrate in the production of felt hats – hence the term "mad hatters". Inhalation of high doses of manganese for extended periods, in connection with welding for example, can cause a clinical picture that resembles Parkinson's disease, "manganism". Improvements in working conditions have resulted in lower quantities of

these substances in the workplace.

Provided by University of Gothenburg

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