Stimulating treatment found for rare balance disorder

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Deakin University neuroscientists have found brain stimulation reduces the symptoms of a rare balance disorder, offering hope to those who have failed to find their land legs years after a trip at sea.

In an Australian first study, Dr Alan Pearce, a neuroscientist with Deakin's School of Psychology, has been investigating the impact repetitive transcranial magnetic stimulation (rTMS) has on people suffering with a rare condition known as Mal de Debarquement Syndrome (MdDS).

"Following a cruise or trip on a yacht, it's not uncommon for people to feel like they are still on the boat bobbing or rocking when they return to dry land, particularly if the seas have been rough. These feeling might last for minutes or even a few hours, however for some people these feelings become chronic, developing into MdDS," Dr Pearce said.

"For people with MdDS, the constant feeling of rocking and bobbing continues for years, and in some cases decades, with debilitating consequences. Sufferers often describe the sensation as feeling like they are walking on a trampoline and find doing the simplest of tasks, such as hanging out the washing, showering or going to the supermarket, near on impossible."

The cause of MdDs is not fully known and it is difficult to diagnose as brain scans appear normal and inner ear testing, particularly the areas of the ear that contribute to balance, shows no abnormalities.

Limited research from the USA has suggested that MdDS occurs when the brain incorrectly adapts to the rocking and bobbing. Early trials have shown that brain stimulation with rTMS may reduce symptoms of MdDS, with one study showing a temporary relief of symptoms after one session.

Dr Pearce used the same rTMS technique in eight sessions (twice a week for four weeks) with 14 participants; half received the real treatment with the other half receiving sham dose. He found that six out of the seven MdDS sufferers who received the real treatment reported a reduction in the rocking and bobbing symptoms and improved confidence in daily activities. In comparison, only one of the seven who received a sham treatment reported an improvement.

"rTMS is a safe and painless way to deliver repeated electromagnetic pulses to select areas of the brain and is often used to treat depression, autism and anxiety. By applying these repeated pulses we were able to show that rTMS can modify the activity of the brain responsible for the ongoing perception of rocking and bobbing, thereby reducing the symptoms of MdDS," Dr Pearce said.

For study participant James Calnin, the rTMS has offered hope that the symptoms of MdDS can be treated.

"Over many months of tests, specialist visits and trialling medications it is a great relief to finally have a diagnosis and a way of alleviating the symptoms," Mr Calnin said.

"After participating in the study I can certainly say that I have more good days than bad and am mentally able to cope a lot better with this condition."

Mr Calnin's symptoms started after a 19 day cruise in 2013. When the

usual "sea legs" progressed into a feeling of rocking, unstable motion, vision problems, headaches, tiredness and jumbled speech, he visited his GP. What followed was months of tests and visits to various specialists, with no diagnosis.

It was an ear, nose and throat doctor Mr Calnin visited for a sore neck who finally suggested he had Mal de Debarquement Syndrome. While initially sceptical, Mr Calnin did some further research before he was convinced "MdDS was the cause of this turmoil" he had been experiencing.

Since taking part in the study Mr Calnin's symptoms returned "with a vengeance" after a bus trip, however this time he was better able to handle the situation as he knew what he was up against. He is now receiving weekly treatments with Dr Pearce.

"While this study validates the results of preliminary studies from the USA, it is too early to claim rTMS as a definitive treatment for MdDS," Dr Pearce said.

"Further research is needed to measure how long the rTMS reduces symptoms for and to also determine the optimal or individualised rTMS dose rather than giving the same treatment parameters to everyone."

Dr Pearce said it is also important to note that rTMS may not be an optimal treatment option for those with other balance disorders.

The results of the study are published in the *Journal of Neuropsychology*.

More information: "Efficacy of neurostimulation to treat symptoms of Mal de Debarquement Syndrome. A preliminary study using repetitive transcranial magnetic stimulation." *Journal of Neuropsychology*. doi: 10.1111/jnp.12070