# Exercise may be key to developing treatments for rare movement disorder

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Spinal cerebellar ataxia 6 (SCA6) is an inherited neurological condition which has a debilitating impact on motor coordination. Affecting around 1 in 100,000 people, the rarity of SCA6 has seen it attract only limited attention from medical researchers. To date, there is no known cure and only limited treatment options exist.

Now, a team of McGill University researchers specializing in SCA6 and other forms of ataxia, have published findings that not only offer hope for SCA6 sufferers but may also open the way to developing treatments for other movement disorders.

**Exercise in a pill**

In mice affected by SCA6, the McGill team, led by biology professor Alanna Watt, found that exercise restored the health of cells in the cerebellum, the part of the brain implicated in SCA6 and other ataxias. The reason for the improvement, the researchers found, was that exercise increased levels of brain-derived neurotrophic factor (BDNF), a naturally occurring substance in the brain which supports the growth and development of nerve cells. Importantly for patients with a movement disorder, for whom exercise may not always be feasible, the team demonstrated that a drug that mimicked the action of BDNF could work just as well as exercise, if not better.

**Early intervention crucial**

The researchers also discovered that BDNF levels in SCA6 mice declined well before movement difficulties began to appear. The drug, they found, worked to arrest the decline only if it was given before the onset of outwardly visible symptoms.

"That's not something we really knew about SCA6," said lead author Anna Cook, a Ph.D. candidate in Professor Watt's lab. "If there are these early changes in the brain that people don't even know about, it tends to advocate for more genetic screening and early intervention for these rare diseases."

**More information:** Anna A. Cook et al, Activation of TrkB-Akt signaling rescues deficits in a mouse model of SCA6, *Science Advances* (2022). DOI: 10.1126/sciadv.abh3260

Provided by McGill University

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