

Wearable device improves gait ability in spinal and bulbar muscular atrophy patients, study finds

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Spinal and bulbar muscular atrophy (SBMA) is a rare X-linked neuromuscular disorder that results from an abnormal expansion of gene sequences in the androgen receptor gene. SBMA has an adult onset and is a slowly progressive disease that usually presents with muscle weakness in the limbs, predominantly in the proximal regions.

In addition, SBMA progressively impairs gait function, leading to the need for patients to use wheelchairs approximately 20 years after onset. Although leuprorelin is the only approved drug available for SBMA, it does not improve [muscle weakness](#) in the limbs, making it difficult for patients to notice improvements in gait ability. As SBMA remains incurable, patient care, including rehabilitation, is important for maintaining physical function and quality of life (QOL).

The Hybrid Assistive Limb (HAL; CYBERDYNE, Inc., Tsukuba, Japan) system is a wearable robotic device developed based on interactive biofeedback theory. HAL links the human nervous system with a robot through bioelectric signals (BES), such as motor unit potentials, sharing information in [real-time](#) and allowing gait training based on the intended movements of the wearer.

Professor Kano Osamu, M.D., Ph.D., and his colleagues conducted a study to evaluate the effect of robot suit exercise training using HAL in patients with SBMA. The study is [published](#) online in the *Journal of Clinical Neuroscience*.

Three patients who were diagnosed with SBMA at Toho University Omori Medical Center between January 2019 and December 2020 and had an unsteady gait with the ability to walk for >10 m with assistance from caregivers and/or a walker were included.

The gait training program consisted of one session per day (20–40 minutes per session), 2–3 days a week for at least 4 weeks, and

continued for 6 courses over 2 years. As a result, the distance of the 2-minute walk test improved on average from 146.1 m to 189.8 m after 6 courses of training. Other outcome measures, including quality of life, also showed some improvement or preservation.

"Our results show that cybernic therapy improves and maintains [gait](#) ability in patients with SBMA over a long period. Furthermore, this also suggests that continuous cybernic therapy may be able to maintain QOL," said Prof. Kano, senior author of the study.

More information: Takehisa Hirayama et al, A preliminary study on the effects of long-term robot suit exercise training on gait function and quality of life in patients with spinal and bulbar muscular atrophy, *Journal of Clinical Neuroscience* (2024). [DOI: 10.1016/j.jocn.2024.110778](#). [www.sciencedirect.com/science/.../S0967586824003175](#)

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