The Use of a Trained Dog as a Gait Aid for Clients with Ataxia: A Case Report

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ABSTRACT

Purpose: To illustrate the use of a trained dog as a therapeutic tool to optimize physical and psychosocial adaptation of clients with ataxia. **Method:** The gait pattern and gait speed of two people with cerebellar ataxia using different gait aids, including a trained intervention dog and an assistance dog, were compared. Participants' experience of working with the dogs was documented via semi-structured interviews. **Results:** The use of an intervention dog as part of rehabilitation allowed clients to explore the benefits of an assistance dog and to optimize their physical functioning. The assistance dog had a less destabilizing effect than other walking aids on the clients' self-image. **Conclusion:** Trained dogs may represent an innovative and positive alternative for mobility for people with ataxia, improving both physical and psychosocial parameters. Assistance dogs seem to be a suitable gait aid, since they facilitate ambulation, promoting independent mobility.

Key Words: animal assisted therapy; assistive device; ataxia; gait.

RÉSUMÉ

Objectif : Illustrer l'utilisation d'un chien dressé comme outil thérapeutique pour optimiser l'adaptation physique et psychosociale des clients vivant avec l'ataxie. **Méthode :** On a comparé la démarche et la vitesse de marche chez deux personnes atteintes d'ataxie cérébelleuse en utilisant différentes aides à la marche, y compris un chien de réadaptation et un chien d'assistance. Des entrevues semi-structurées ont permis de documenter l'expérience des clients avec les chiens. **Résultats :** L'utilisation d'un chien comme élément de la réadaptation a permis aux clients d'explorer les bienfaits d'un chien d'assistance et d'optimiser leur fonctionnement physique. Le chien d'assistance semble moins dommageable pour l'image de soi que les autres aides à la marche. **Conclusion :** Les chiens dressés peuvent représenter une solution innovatrice et positive sur le plan de la mobilité pour les personnes vivant avec l'ataxie ; améliorant les paramètres tant physiques que psychosociaux. Les chiens d'assistance semblent améliorer le patron de marche puisqu'ils facilitent les déplacements et favorisent la mobilité autonome.

Cerebellar ataxia is a neurological pathology that results in lack of coordination, gait impairment, and balance impairment.¹ Traditional gait aids may not be suitable for ataxic clients because of their impaired single-limb coordination;^{2,3} for example, using a cane or walking poles may require constant coordination of the arms, and a wheelchair may therefore be a last resort for locomotion. Finding a suitable gait aid for clients with ataxia is a concern during rehabilitation.

On a psychosocial level, adaptation to the disease and the impact of gait aids on clients' self-image represent major challenges. Difficulty adapting to the disease can lead to isolation and disengagement on social and professional levels and may explain why depression and anxiety are more prevalent among people with neuromuscular diseases than in the general population (depression: 42%–45% vs. 16.2%; anxiety: 55% vs. 14%–25%).^{4,5}

The purpose of this case report is to illustrate the physical and psychosocial benefits of using intervention and assistance dogs during rehabilitation of clients with ataxia. Intervention dogs (ID), also called rehabilitation dogs,⁶ are specially trained to assist trained professionals in goal-directed interventions.⁷ They follow the therapist's commands and are used within the facility as an additional tool for rehabilitation. Assistance dogs (AD) are trained to help a person with a physical disability and mobility impairments.⁸ They follow the commands of the person they assist and are used to improve independence in daily activities. The dogs described here were trained by the MIRA Foundation,⁹ and the interventions occurred at the Centre de Réadaptation Lucie-Bruneau.

METHODS

Two clients with cerebellar ataxia who were referred to rehabilitation agreed to participate in this project.

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Informed consent was obtained. The interventions were provided to clients as part of their rehabilitation.

Case description

Client A was a 22-year-old woman living with her spouse. She was referred to physiotherapy for balance problems and frequent falls (more than three per day). On assessment, she demonstrated deficits in strength, endurance, and coordination of all four limbs, and balance (unable to stand with a normal base of support without assistance); she could not walk without assistance. Her goals were to resume her studies, to remain socially active, and to require less assistance from her spouse.

Client B was a 47-year-old man working full-time as a teacher and living alone. He was referred to physiotherapy for assessment and treatment of his balance and gait. On assessment, he demonstrated impaired balance with frequent falls. The presence of stairs in his workplace was a major environmental barrier and jeopardized his ability to continue working.

Intervention

Client A attended physiotherapy twice a week for 6 months. Her rehabilitation objectives were to improve muscular strength, balance, walking endurance, gait pattern, and independent mobility. A cane, walking poles, and two- and four-wheeled walkers were tried, but none of these gait aids improved her walking ability; she caught her feet in the walkers and had difficulty coordinating all four limbs with the walking poles and cane. Despite using a wheelchair, she continued to require assistance for propulsion. The physiotherapist tried using the ID, with positive results. The ID was used for gait training (increasing walking distance, improving gait pattern, ascending and descending curbs, and avoiding obstacles), static balance (standing with narrower base of support), stair climbing, and transfers (floor to chair). After realizing the benefits of using the ID, Client A decided to obtain an AD.

Client B attended physiotherapy twice a week for 8 months. His rehabilitation objectives were to identify a safe gait aid and to improve walking endurance and balance to reduce falls (mostly in stairways). He was resistant to gait aids but agreed to trial a cane, walking poles, and a walker; however, none of these aids led to safer ambulation, and above all, none facilitated stair climbing. Unfortunately the ID was not available for trial at the time, but the physiotherapist suggested that he request an AD. Upon obtaining his AD, he continued gait and balance treatment to optimize walking ability with this new gait aid.

Outcome measures

Each client's walking pattern was video recorded in different conditions: with no gait aid, with walking poles,

Table 1 Functional Gait Speed in m/s (measured over 10 m)

Condition	Functional gait speed over 10 m, m/s	
	Client A	Client B
No gait aid	0.77	0.83
Walking poles	0.59	0.71
4-wheeled walker	0.47	0.66
Intervention dog	0.71	0.83
Assistance dog	1.1	0.83

with a 4-wheeled walker, with the ID, and with his or her AD. Clients walked once in each condition over a 10 m walking track; their gait speed was also measured.¹⁰

During a semi-structured interview, clients were encouraged to share their experience of working with the ID and of daily life with their AD.

RESULTS

The video recordings show the differences in gait pattern and illustrate the physical benefits of using a trained dog for mobility.*† Clients' gait speeds are shown in Table 1.

The use of walking poles requires upper-extremity coordination, while the intervention and assistance dogs represent a dynamic gait aid that can adapt and respond to sudden loss of balance (see Table 1).

Client A

Using the ID represented a major discovery for Client A, as she was able to practice transfers and walk independently without severe loss of balance (6-minute walk test = 309 m at discharge; there was no initial score, as she was unable to walk unassisted). Working with the ID helped her improve her walking pattern by maintaining a more linear trajectory, a narrower base of support, arms closer to the body, and a better cadence.

Client A's experience with the ID allowed a concrete exploration of the benefits of an AD and facilitated her decision-making process:

In the beginning, I didn't see ... how a dog could help me ... It was really when I tried it that I decided to apply for an assistance dog.

With her AD, she resumed her studies and was able to ambulate independently. She reported a greater sense of security, greater autonomy with respect to her spouse, greater social involvement, and feeling more comfortable among others:

I have the impression that people are judging me less with a dog than with a wheelchair.

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Client B

Working with a physiotherapist knowledgeable about using an ID enabled Client B to theoretically explore the benefits of working with an AD. Physiotherapy treatments served to optimize his walking and balance skills with his AD, resulting in improvements in trunk control, balance, and walking pattern, although his gait speed did not change (see Table 1). The number of falls he experienced decreased, and his Berg Balance Scale¹¹ score improved from 40/56 to 42/56. Client B's AD allowed greater autonomy in using stairs, which enabled him to remain at his job. Being able to remain professionally active had a positive impact on his quality of life and psychological health:

I work because of my assistance dog ... the reason I'm still alive is my work.

With his AD, Client B reported a greater sense of security/freedom, emotional presence, and professional autonomy, as well as greater cooperation from strangers.

CONCLUSION

IDs may be a useful therapeutic tool to help clients explore the benefits of a dog as a gait aid and to optimize physical performance in preparation for obtaining an AD.

The AD is a gait aid adapted to the needs of clients with ataxia, as ADs can provide dynamic support in all directions, allowing clients to pull or push on the harness after balance disruption. For both clients described here, the AD significantly improved walking patterns, promoted safer independent mobility, and facilitated social and professional involvement.

The results of this pilot study have encouraged us to continue to use the ID and to pursue efforts to enable clients with ataxia to obtain an AD. It is important to

develop a project with a broader scope to further document the physical and psychosocial benefits of using IDs and ADs with clients with ataxia.

REFERENCES

1. Marsden J, Harris C. Cerebellar ataxia: pathophysiology and rehabilitation. *Clin Rehabil*. 2011;25(3):195–216. <http://dx.doi.org/10.1177/0269215510382495>. Medline:21321055
2. Ilg W, Golla H, Thier P, et al. Specific influences of cerebellar dysfunctions on gait. *Brain*. 2007;130(3):786–98. <http://dx.doi.org/10.1093/brain/awl376>. Medline:17287287
3. Morton SM, Tseng YW, Zackowski KM, et al. Longitudinal tracking of gait and balance impairments in cerebellar disease. *Mov Disord*. 2010;25(12):1944–52. <http://dx.doi.org/10.1002/mds.23169>. Medline:20544808
4. Lundeen J, Fisher J, Kothari MJ. Frequency of anxiety in myasthenia gravis. *J Clin Neuromuscul Dis*. 2004;6(1):9–12. <http://dx.doi.org/10.1097/01.cnd.0000138445.13978.e4>. Medline:19078747
5. Stewart SB, Robertson KR, Johnson KM, et al. The prevalence of depression in myasthenia gravis. *J Clin Neuromuscul Dis*. 2007;8(3):111–5. <http://dx.doi.org/10.1097/CND.0b013e3180316324>
6. Rondeau L, Corriveau H, Bier N, et al. Effectiveness of a rehabilitation dog in fostering gait retraining for adults with a recent stroke: a multiple single-case study. *NeuroRehabilitation*. 2010;27(2):155–63. Medline:20871145
7. Pacific Assistance Dogs Society. PADS home page [Internet]. Burnaby (BC): The Society; c2013 [cited 2012 Sep 10]. Available from: <http://www.pads.ca>
8. Assistance Dogs International. Types of assistance dogs [Internet]. Santa Rosa (CA): Assistance Dogs International; c2013 [cited 2013 Feb 13]. Available from: <http://www.assistedoginternational.org/about-us/types-of-assistance-dogs/>
9. MIRA Foundation. MIRA home page [Internet]. MIRA Foundation; 2013. Available from: <http://www.mira.ca/en>
10. Bohannon RW. Comfortable and maximum walking speed of adults aged 20–79 years: reference values and determinants. *Age Ageing*. 1997;26(1):15–9. <http://dx.doi.org/10.1093/ageing/26.1.15>. Medline:9143432
11. Berg KO, Wood-Dauphinee SL, Williams JJ, et al. Measuring balance in the elderly: validation of an instrument. *Can J Public Health*. 1992;83(2 Suppl 2):S7–11. Medline:1468055