Movement Disorders
CLINICAL PRACTICE

CASE REPORT

# Adult-Onset Alcohol Suppressible Cervical Dystonia: A Case Report

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Here, we report on a novel case of an adult-onset jerky cervical dystonia with a striking degree of alcohol sensitivity. We discuss the diagnostic implications of such alcohol sensitivity.

## Case Report

A 66-year-old woman presented for the first time to the neurology service because she needed to lie still for radiotherapy treatment. There were concerns from the treating team that this would be difficult because of her continuous head movements. She had first been aware of the movements 26 years previously. Initially, it had been a subtle symptom, but, over the years, had progressed in severity. The patient also described occasional jerkiness in her right hand and how drinking alcohol could completely abolish the movements. Holding her face also reduced their amplitude. The patient recalled that her paternal great aunt had displayed similar movements. The neurological examination was normal apart from signs consistent with a jerky cervical dystonia, as evident in the Video. This was taken 3 months after botulinum toxin injections, and some of the jerkiness remained partially suppressed.

The patient's extreme history of alcohol sensitivity prompted testing for an epsilon-sarcoglycan gene (SGCE) mutation in spite of the typically younger presentation of myoclonus dystonia. As expected, this was negative.

We then tested for mutations in the GTP cyclohydrolase 1 (GCH1) gene because of the increasingly wide phenotypes reported in dopa-responsive dystonia. Multiplex ligation-dependent probe amplification detected deletion of exon 2 of the GCH1 gene. Sequencing analysis of exon 2, including intron/exon boundaries, was then undertaken to ensure that this was a true deletion and not a sequence variant. No sequence variants were detected.

She consumed 2 units of alcohol before her radiotherapy sessions and was able to lie completely still and successfully receive treatment. Given the option, she chose botulinum toxin injections over levodopa treatment because she preferred the convenience of occasional injections to a daily medication. Botulinum toxin injections resulted in almost complete control of symptoms for 3 months, before repeat injections were given.

## Discussion

The subtype of dystonia that is most notable for alcohol sensitivity is myoclonus dystonia (DYT11), and indeed this condition has historically also been referred to as alcohol-responsive dystonia. It is characterized by frequent, brief, irregular, muscular contractions leading to jerky myoclonic movements, in addition to the more sustained muscular contractions causing the abnormal posturing found more usually in dystonia. Most cases result from loss-of-function mutations in the SGCE.[1] This gene is maternally imprinted, so usually disease only results if the mutated allele is inherited from the father.[2] Although it presents during childhood or adolescence and principally affects the upper body and with greater jerkiness than observed in our case, given the very striking alcohol responsiveness we tested for mutations in the SGCE gene and found none. Instead, her genetic testing revealed a mutation in the GCH1 gene, known to be the cause of dopa-responsive dystonia.

Dopa-responsive dystonia, DYT5, most commonly presents as a childhood-onset lower-limb dystonia with diurnal variation, progressing to involve all four limbs. Patients may experience few symptoms in the morning and worsening over the course of the day or with activity. Other clinical appearances may be of spasticity. Rarer manifestations have also been described, with adult and upper-limb presentations increasingly recognized.[3] A dramatic reduction in symptoms is noted with L-dopa treatment. Dopa-responsive dystonia is most commonly the result of a mutation in the GCH1 gene. This gene codes for a protein of the same name, which is the rate-limiting step in the synthesis of tetrohydrobiopterin, an essential cofactor required by multiple amino acid hydroxylases and nitric oxide synthases.[4]

This genotype has been reported previously in association with dystonia and parkinsonism.[5] Interestingly, this mutation

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has also previously been reported by Leuzzi et al.,[6] who describe a childhood-onset myoclonus dystonia-like syndrome resulting from GCH1 mutations, with other family members having adult-onset upper-limb tremor. They do not, however, describe alcohol sensitivity. At the time of writing, we are not aware of any case presenting with exquisitely alcohol-sensitive adult-onset cervical dystonia.

This case highlights the fact that a wider range of subtypes of dystonia may show marked alcohol responsiveness than just DYT11 and adds adult-onset alcohol responsive dystonia to the range of presentations observed with DYT5.

## Author Roles

(1) Research Project: A. Conception, B. Organization, C. Execution; (2) Statistical Analysis: A. Design, B. Execution, C. Review and Critique; (3) Manuscript: A. Writing of the First Draft, B. Review and Critique.

H.J.G.: 1C, 3A, 3B

P.G.: 1A, 1B, 1C, 3B

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## Supporting Information

A video accompanying this article is available in the supporting information here.

**Video.** The video includes the key features of the patient's history, namely, time course, progression, location of abnormal movements, and the alcohol sensitivity she has noticed. Throughout, the patient's jerky cervical dystonia is present. Holding her face settles the tremor somewhat, and on raising the outstretched arms, no significant tremor can be seen.



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