

The inherited cerebellar ataxias

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Cerebellar ataxia can be thought of as a syndrome with many different causes. In the UK, the most common non-familial causes are multiple sclerosis and alcoholic cerebellar disease. This article focuses on the cerebellar ataxias which result from genetic causes. These are rare, progressive neurological disorders, characterised by problems with balance and co-ordination. They are often classified on the basis of inheritance. [See reference 1 for full list]

Numerous different dominantly inherited ataxias have been identified. The genes responsible are numbered SCA1, SCA2, SCA3 etc. Over 25 subtypes are recognised.^[1] In UK centres, tests exist for around 40% of these. The most common autosomal recessive ataxia is Friedreich's ataxia. Other recessive ataxias include ocular motor apraxia, ataxia with Vitamin E deficiency and the recently identified ataxia with CoQ10 deficiency (which appears to respond to treatment with CoQ10 tablets).^[1,2]

Episodic ataxias are characterised by dysarthria, tremor and nystagmus, lasting minutes to hours. They are subdivided into two disorders on clinical and genetic grounds. Episodes are often suppressed by acetazolamide. Patients need to be warned about the risk of nephrolithiasis on long-term acetazolamide therapy; the incidence of this complication is estimated at 20%. Some patients may experience a progressive ataxia underlying short-lived episodes.^[3,4]

Clinical features

Onset can be from infancy to old age, but most commonly between the ages of 20-60 for the dominant ataxias.^[5] Many people are therefore diagnosed after they have had children. Friedreich's ataxia tends to be diagnosed earlier in life, the average age of onset being 15 years old.^[6] Prognosis is variable but patients with later onset usually experience slower progression.

The following features are common presenting or early manifestations:^[5,6]

- Progressive ataxia of gait (usually broad based)
- Progressive limb ataxia including tremor
- Progressive slurring dysarthria
- Nystagmus
- Scoliosis (only in Friedreich's ataxia).

Later on during the course of these diseases:

- Ophthalmoplegia
- Dysphagia
- Parkinsonian features (seen in SCA2 and SCA3)

Ataxia UK

Ataxia UK provides information and support to people affected by the ataxias, as well as funding medical research.



Wendy, a member of Ataxia UK, and dog, Sophie

Quotes from people affected by the ataxias:
"Strangers accuse me of being drunk, which I find very hurtful."

"My son's diagnosis took three years - people just thought I was a neurotic mum."

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References

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- Cardiomyopathy, diabetes (only in Friedreich's).

A minority of patients may encounter:

- Decrease in visual acuity
- Cognitive decline.

Diagnosis, investigations and management

Genetic testing is available for some inherited ataxias and gives a diagnosis of the specific sub-type of ataxia. Patients may require assessment by both a neurologist and a clinical geneticist.

A number of diagnostic tests may also be relevant to exclude multiple sclerosis, posterior fossa tumours, alcoholic cerebellar ataxia or ataxia as a non-

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metastatic manifestation of malignancy. Ataxia may also be caused by medication, particularly phenytoin. Vitamin E deficiency may cause a progressive ataxia and should always be excluded, even if there are no overt gastrointestinal problems, as it is treatable with Vitamin E.^[7] The presentation is similar to Friedreich's ataxia, and there have been cases of misdiagnosis.^[8]

Relatives of patients with an identified inherited cerebellar ataxia may be at risk of inheriting ataxia or being a carrier. In families with an identifiable mutation, both predictive and prenatal gene testing is technically straightforward. The genetic clinic will help those at risk in coming to their own decision.

Modern management involves regular review with a multidisciplinary team, which may include neurologists, rehabilitation physicians and therapists. Physiotherapy is often valuable, particularly to preserve mobility. Advising on walking aids is complex since the patient's major requirement is stability. Some patients find a stick or "rollator" frame helpful. At the appropriate stage, patients should be referred to an occupational therapist for advice on aids and adaptations and a wheelchair clinic for specialist seating advice. A speech and language therapist will help with dysarthria and dysphagia, which may become more common as the disease progresses. In advanced disease this can lead to weight loss or aspiration. Suspect aspiration if the patient swallows with difficulty, coughs after swallowing or has repeated chest infections.

In Friedreich's ataxia, scoliosis is common and may be severe, therefore referral to an orthopaedic surgeon with an interest in scoliosis is advised. If cardiomyopathy is present regular review by a cardiologist are also required.^[6]