

Vascular gait dyspraxia

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Introduction

Virtually all who encounter older people in their clinical practice know that many of them have disorders of gait and balance. However, this is often accompanied by a lack of diagnostic curiosity as to aetiology and frequently a therapeutic agnosticism, or even nihilism.

This is a pity because a gait disorder is always an indicator of usually undetected illness, or illnesses, and therefore presents a double opportunity: to treat the underlying condition, as well as the gait abnormality. In addition, advances in classification of gait disorders, as well as increasing recognition of higher-level gait disorders of vascular origin (or vascular gait dyspraxia),¹ facilitate a more practical and scientifically valid approach to gait disorders in this population.

The prevalence of gait abnormality is 35% among people aged >70 years.² Such disorders are a marker for increased vigilance for frailty and are associated with reduced quality of life and risk of entry to nursing home.³ As with many chronic disease and geriatric syndromes, the improvements gained through focused diagnosis and treatment may appear modest, but may make a significant difference to function and quality of life for the older person.

The safest clinical point of departure is that, if an older patient cannot walk in a reasonably nimble fashion without a walking aid, then he or she has a gait disorder that you as a doctor are likely to be able help to alleviate. As with some geriatric syndromes, such as incontinence, the physician may need to proactively broach the subject. All those who present with falls should be screened for a gait disorder.

A further challenge is that older people often unconsciously adapt to, and develop, an acceptance of gait and balance disorders, particularly those that develop slowly: a significant minority may not admit to, or recognise, having a gait disorder.⁴ Unlike pain or dyspnoea, older people may not see problems with walking as a symptom worth bringing to their doctor's attention, or believe that it is possible to do much about it.⁵ Indeed, it is remarkable how they normalise their compensatory strategies, such as 'furniture crawling', a classic response to more severe levels of gait disorder.

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Advances in classification

The most helpful classification of gait disorders is that of Liston *et al* which parses on the basis of the level of the deficit, which may be one level, or a combination of three levels: lower, medium and high.⁶

Lower-level gait disorders

Lower-level gait disorders are due to deficits distal to the central nervous system, including the following:

- > peripheral musculoskeletal problems, eg osteoarthritis, rheumatoid arthritis and myopathies: they tend to result in 'compensatory' gaits, eg antalgic, and can often be compensated for with a walking aid
- > peripheral sensory disturbance, such as sensory neuropathies and disorders of proprioception.

Middle-level gait disorders

Middle-level gait disorders are those with focal neurological symptoms/signs where the gait disturbance is consistent with the neurological findings and include the following:

- > hemiparetic gait, in which the leg swings outwards in a semicircle from the hip, with a hyperextended knee and inverted, plantar-flexed ankle
- > Parkinsonian gait, with short, shuffling steps, reduced arm-swing, clock-face turning, festination and, in later stages, retropulsion
- > cerebellar ataxia, with broad-based, staggering gait with inappropriate timing of foot placement.

Higher-level gait disorders

Perhaps among the most common, and up to recently the least well recognised, of gait disorders are the higher-level gait disorders, an umbrella term used to describe gait abnormalities that cannot be explained by demonstrable deficits in the pyramidal, extrapyramidal, sensory or cerebellar systems.⁶ In most cases, this is due to cerebrovascular disease, both large and small vessel, and may have elements of both overt and occult stroke disease;⁷ the term 'vascular gait dyspraxia' (VGD) is helpful. The association with white matter changes has been recognised in increasing numbers of studies.⁸

Patients may present with elements of pure dysequilibrium, failure of gait ignition or both: some may previously have been categorised as vascular parkinsonism. If the higher-level

gait disorder occurs in isolation (no arthritis, no neurological signs other than the gait disorder itself), the diagnosis can be straightforward. However, if it occurs with a low- and or middle-level gait disorder, as might be expected in a population in whom multi-morbidity increases with age,⁹ the diagnosis depends much more on making a judgement as to whether the degree of gait disorder is consistent with the extent of the middle- and lower-level gait disorders, or whether it is greater than might be expected, in which case there is also a higher-level gait disorder. If in doubt, an opinion from a geriatrician can be of assistance.

It is important clinically to detect each level of gait disorder present, because different treatment modalities can apply to each.

Assessment

Much like the classic example of being alerted to respiratory disease by the sputum pot on the bedside locker, the walking stick or frame should prompt the doctor to investigate the reason for the need for such an aid.

The assessment of gait and balance disorders in an older patient can be a complex one, involving attention to the neurological system (including cognition), musculoskeletal and sensory systems (vision and hearing), as well as the home environment.

It is helpful to establish the acuity with which the gait disorder started, and its progression since then. An informant history, with particular attention paid to decline in mobility and cognition, and the circumstances surrounding any falls, adds richness to the initial history and can be invaluable. As the older person may have adapted to a gradually developing gait disorder, a relative may actually have a better sense of the timeline involved.

Observation as the patient comes into the clinic room is a good start, looking at posture, speed and style of gait. A shuffling unsteady gait, with little lifting of the feet in the absence of signs of other signs of parkinsonism, is most likely to be a higher-level gait disorder. A waddling gait may suggest a proximal myopathy and ataxic gait cerebellar disease or severe peripheral neuropathy.

The clinical diagnosis of higher-level gait disorder relies on a clear sense of the status of the pyramidal, extrapyramidal, sensory and cerebellar systems. This can be done rapidly, but the patient does need to be on an examination couch and have their shoes and socks off, and trousers as well if not easily pulled up to mid-thigh.

Inspection of the face, posture and speed of movement, as well as movement of the arms or legs can be a guide to whether or not there is parkinsonism present (extrapyramidal): then anything less than 5/5 power on straight-leg raising is abnormal (generally pyramidal/muscular, but severe arthritis of the hip can make this an expert judgement call). Sensory assessment of touch, reflexes and heel–shin coordination rounds off a reasonably rapid assessment. Any of the standard cognitive tests, such as the Mini-Mental State Examination or the Montreal Cognitive Assessment, are appropriate for cognitive screening,¹⁰ and a useful brief measure of gait and balance is the Timed Get-Up and Go Test.¹¹

The musculoskeletal system examination focuses on signs of arthritis, as well as assessment for myopathy. Vision and

hearing are worth checking in terms of pursuing conditions such as cataract, macular degeneration and hearing loss.

Finally, it is worth asking about symptoms of postural hypotension, which is linked with cognitive impairment and higher-level gait as part of a ‘Bermuda triangle’ of falls in older patients.¹² As the patient may have also gradually adapted to this condition, a question such as ‘Can you move from lying down in bed to standing and walking straight away without light-headedness or dizziness, or do you need to take it in stages?’ should be asked. The rule of thumb is that, if patients have postural symptoms, they have postural hypotension. Lying and standing blood pressures are challenging to perform in a correct manner, and notoriously insensitive.

Although most patients with the triad of urinary incontinence, cognitive impairment and gait disorder will have vascular gait dyspraxia and a vascular or mixed dementia, a computed tomography (CT) brain scan is prudent to rule out the rare syndrome of normal pressure hydrocephalus and detect radiological evidence of stroke and leukoaraiosis.

Management

Management of gait disorders should be individually tailored and multidisciplinary. Early intervention can prevent further decline in mobility and functional independence.

Treatment of predisposing medical causes can help improve gait, eg up-titration of medications for Parkinson’s disease, treatment with steroids in polymyalgia rheumatica or steroid-sparing medication for steroid-induced myopathy.

It is essential also to address any other medical problems that may indirectly increase risk of falls in those with gait disorders, such as orthostatic hypotension exacerbated by medications, especially diuretics, antihypertensives and central nervous system-acting drugs:¹³ medications should be reviewed and rationalised whenever possible.

Equally, postural hypotension contributes to impaired balance and is a prominent contributory cause of falls in older people. Antihypertensives and other medicines that cause postural hypotension, such as anticholinergics, should be reviewed.

Impaired visual acuity and poor hearing¹⁴ should be treated where possible: treatment of cataracts is associated with improvement of measures of gait efficiency.¹⁵

As most higher-level gait disorders are vascular (and generally progressive) in origin, it seems sensible to review vascular prevention strategies, such as lifestyle and treatment of hypertension (with due caution not to precipitate postural hypotension) and hyperlipidaemia, although there have been no trials to assess the effectiveness of doing this.

Physiotherapy-based gait and balance re-education programmes lie at the heart of improving mobility status and reduce the risk of falls.¹⁶ Higher-level gait disorders can be especially responsive to this therapy, which focuses on improving trunk and core stability, improving muscle strength and recruiting compensatory strategies. In addition, a competent physiotherapist can work on pathologies at other levels, such as muscle strengthening in osteoarthritis and proximal myopathy.

Falls prevention programmes are effective¹⁷ and applicable to those with VGD and other gait disorders. This can be delivered by physiotherapy, occupational therapy¹⁸ and nurse specialists,

in either a day hospital or a community setting. Particular attention is paid to reducing environmental risks for falling, such as using supportive footwear, removing clutter, securing rugs and using lights to brighten dark hallways. Focused work with therapists on safety awareness may also be beneficial.

Continued exercise and physical activity in a community setting can help maintain gait and balance. Home exercise promotes sustained muscle and bone strength while formal exercise classes can reduce the risk of falls and improve gait and balance. As VGD is generally progressive and decompensation may occur during acute illness ('off legs'), the patient and family should also be advised to reattend their family doctor and community therapists if there is any subsequent deterioration in gait and balance with a view to reassessment and review of management strategies. ■

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