



Functional Movement Disorder in Older Adults

16

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Clinical Vignette: Part I

Mrs. P. was a 76 year old retired teacher and was brought to the hospital by ambulance with reported paralysis of her left side. While she had been at home and attempted to walk from the dining room table to the living room, she felt weak and let herself down to the floor. When she felt unable to get up again, she called an ambulance after crawling to a nearby phone. In the Emergency Department, she could not walk, had difficulty with her speech output and endorsed severe pain in her lower back. She was noted to have a downward drift without pronation of her left arm and apparent motor inconsistency, being unable to lift her left leg in the air on command but observed to move the leg while repositioning herself in bed. She was admitted to the inpatient stroke service, after an acute stroke protocol was activated in the emergency department. Acute thrombolytic treatment with intravenous tissue plasminogen activator (tPA) was offered but she decided against this due to concerns over bleeding risk. A brain computed tomography (CT) scan and CT angiogram did not show signs of a

large vessel occlusion, and a brain magnetic resonance imaging scan only showed mild age related volume loss and mild small vessel cerebrovascular disease, but no imaging changes consistent with acute stroke. Her past medical history was notable for high blood pressure, osteoarthritis and well-controlled diabetes. She also had a serious health scare several years ago, where she had severe pain in her legs and stomach, with scans revealing an abdominal aortic aneurysm. She underwent reparative surgery at that time without obvious complications.

Introduction

Conventionally, geriatrics has been defined as medical care for adults over the age of 65 [1], although most people do not require geriatric expertise until their 70s or even 80s. With increasing life expectancy, the population over the age of 65 represents around 15% in the United States alone, about one in every seven Americans. In addition to chronological age, other factors such as multiple chronic medical conditions, increased vulnerability for occurrence of medical complications and threatened loss of autonomy define the elderly patient.

Categorical definitions of the ‘old’, ‘elderly’, ‘aged’ and ‘ageing’ are neither straightforward nor universally applicable. Old may be defined in individual-, cultural-, country- and gender-

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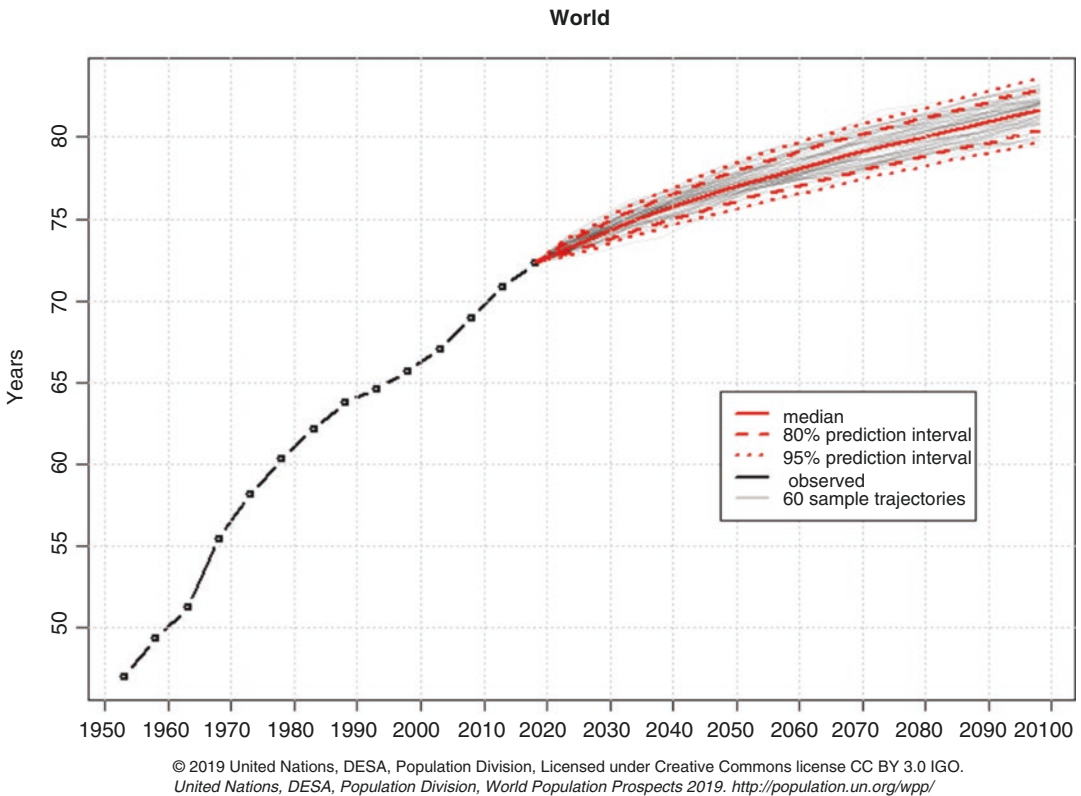


Fig. 16.1 Predicted global life expectancy increase in men and women from 2020 to 2100. (Source: United Nations World Populations Prospect report 2019, <https://>

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specific terms. The definitions can differ between the sexes as life-course events contribute to ageing transitions, for example, going through menopause and retirement from work. The United Nations predicts a continued steady increase in global life expectancy in men and in women over the next decades (see Fig. 16.1).

Prevalence of FMD in Older Adults

Although women and younger adults are more commonly affected with functional movement disorder (FMD) [2–4], recent studies have demonstrated that approximately 20% of patients with FMD may have onset of their symptoms after the age of 60 [2, 4–6]. In a recent retrospective study in an academic hospital in Germany, half of FMD diagnoses in patients admitted to an

inpatient neurologic ward were uncovered in patients with previously established neurodegenerative disorders, a level of co-occurrence in the high end of the previously reported range [2]. It is important to note that the age spectrum for first occurrence of FMD can be wide and FMD is likely underdiagnosed in older adults [2, 3, 5]. In an international survey of 519 members of the International Movement Disorder Society in 2008, probing diagnostic and management issues in FMD, it was found that the extremes of age (<6 or >75 years) were “very influential” for steering neurologists towards a diagnosis other than FMD. Similar responses were found in an updated version of the survey 10 years later, emphasizing the need for improved education about FMD for neurologists and other healthcare professionals [7, 8]. Additionally, the lack of reliable prevalence studies for FMD, partly due to

use of inconsistent documentation, billing codes and hesitancy by many physicians to make the diagnosis of FMD, make it challenging to provide specific statistics regarding the intersection of older age and FMD presentations.

Missing a diagnosis of FMD in older adults can have serious consequences for patients, such as initiation of unnecessary and potentially dangerous treatments for presumed alternative neurological conditions and missed treatment opportunities (see Clinical Vignette: Part I). A case report by Abrol and LaFaver [9] describes a 66 year-old man with intermittent leg weakness and speech impairment misdiagnosed as myasthenia gravis and chronic inflammatory demyelinating polyradiculoneuropathy (CIDP), who was unnecessarily treated with eight cycles of intravenous immunoglobulin infusions before correctly diagnosed with FMD and achieving a full remission of symptoms after undergoing a multidisciplinary motor retraining program.

Risk Factors for FMD in Older Adults

FMD in older adults frequently presents in the setting of comorbid neurological disorders (this is estimated to be about 10%) [10, 11], after a physical injury, or isolation [5] which occurs frequently in geriatric patients, adding additional challenges to the diagnosis of FMD [11–14].

A diagnosis of FMD can precede the later diagnosis of another neurological condition, such as Parkinson's Disease (PD) or another neurodegenerative condition. In a case-control series of patients with PD and functional neurological symptoms, Wissel et al. [11] reported that FMD preceded or co-occurred with PD in 34% of patients, with FMD occurring nearly always in the most affected body side. Functional neurological symptoms were more common in women with PD, with pre-existing psychiatric disorders and a positive family history of PD as additional risk factors. The authors suggested that functional neurological manifestations may be prodromal to PD in up to one-third of patients. Conversely, functional limb weakness as presented by Gelauff and colleagues [15] was rarely

connected to the later development of another neurological diagnosis but was associated with a higher mortality rate than expected – along with symptom persistence and disability in a large subset. These points argue for the importance of long-term medical follow-up for patients with functional limb weakness, not only to guide treatment, but also to remain vigilant regarding patients' overall health. Also of interest, in 3 of 76 patients in Gelauff's prospective case series, functional limb weakness appeared prodromal to the later development of a neurodegenerative disease (i.e., Huntington's disease, PD, and idiopathic cerebellar degeneration).

Batla et al. [5] performed a retrospective review of patients with FMD who were seen at their center over 5 years. Of 151 patients with FMD, 21% had onset after age of 60 years, defined as elderly. They reported that physical trauma, medical events and surgery were the most common precipitating factors for FMD in the elderly, including road traffic accidents with head injury, accidental falls, and stroke. Psychological triggers were identified in only 9.1% of cases. As an example, one patient developed frequent lip-smacking movement immediately after an MRI investigation for neck pain, during which the patient had experienced severe claustrophobia.

In a recent study on geriatric patients with FMD in an inpatient setting, 22% of patients had a history of physical trauma in close temporal relationship with the onset of functional neurological symptoms in the form of stroke, head injury due to a motor vehicle accident, or accidental falls, while 55% of the patients reported recent familial or financial stressors [2, 5, 6]. Psychological stressors are not always recognized in the initial interaction with the patient and may not be identified because they are not deemed as relevant for the patient's current symptoms, but should always be inquired about.

It is important to note that the new diagnostic criteria in the DSM-5 are applicable to a wide range of potential trigger factors for FMD, such as physical trauma or medical illness in addition to physiological or psychosocial events [3, 16]. Especially in the elderly, changes in relation-

Table 16.1 Examples of common medical and psychosocial concerns in older adults as predisposing (risk) and precipitating (triggering) factors for functional movement disorder

Medical issues	Psychosocial issues
Multiple medical problems and/or multiple medications to manage chronic conditions	Changes in living circumstances, e.g. spouse's illness or death
Increased vulnerability ("frailty")	Loss of independence
Cognitive decline and dementia	Behavioral and mood (neuropsychiatric) changes, including sadness, depression or anxiety
Difficulty performing activities of daily living	Lack of a support network/loneliness
Weakness from deconditioning	Difficult dynamics with adult children
Balance and gait problems	Fear of dying
Nutritional concerns, including unexplained weight loss	Financial problems

ships, difficult dynamics with adult children, difficulties with identity after retirement, fear of dying [2, 3], familial disputes, financial difficulties, spouse's illness or death [6], and problems originating from loneliness, should be explored as part of the patient's psychosocial history. Batla et al. [5] observed that older adults and younger patients with FMD did not differ significantly in terms of the presence of a stressor or precipitating factors (Table 16.1).

Characteristics of FMD in Older Adults

Acute onset of FMD is common, which can broaden the differential diagnosis to include other acute neurological disorders such as stroke, and poses challenges especially in geriatric patients with multiple medical comorbidities. In addition to differentiating FMD from other acute neurological conditions, the co-occurrence of FMD with other chronic neurological conditions is a common situation as highlighted in the last section.

It is important to evaluate conditions on the differential diagnosis through use of additional

diagnostic studies as appropriate. Nonetheless, the most recent suggested diagnostic criteria for FMD [16] highlight the importance of positive clinical signs and replace the view of functional neurological disorder as a "diagnosis of exclusion" [2, 15, 17]. Physicians treating geriatric patients with movement disorders need to be alert regarding the possibility that FMD may be the predominant source of disability [2].

Functional tremor is the most reported phenomenology of FMD, accounting for around 50% [3, 4]. The body parts most commonly affected are the upper limbs, however lower limbs and head can also be affected [6]. Functional gait abnormalities are also reported to be frequently present in older patients and may be even more common than in the younger population [5, 6]. "Fear of falling" presents a typical functional gait manifestation in the elderly, with variable fluctuations of stance and gait, sudden buckling of knees, and, "uneconomic" postures. Please note that not all gait disorders due to fear of falling are functional in nature; some patients present with (pure) phobic and protective gait which has an avoidant, but no demonstrative component. A subset of patients with fear of falling type functional gait will be able to readily report that anxiety and heightened arousal associated with gait tasks (including features such as breath holding) are part of their symptom complex. Also, a "walking-on-ice" gait pattern and exacerbation of other functional movements (particularly dystonia) during walking can be observed. Risk factors for developing these gait patterns can include medical comorbidities such as arthritis and a neuropathy, serving as background vulnerabilities for a fear of falling type gait (potentially with a prior mechanical fall and accompanying anxiety also relevant factors in these clinical presentations). Functional dystonia, choreiform movements and tics can also occur in older patients with FMD; in such instances, providers should work to differentiate alternative diagnoses such as medication-induced chorea (e.g., tardive dyskinesias or levodopa induced dyskinesia) or late onset genetic conditions such as Huntington's disease that can sometimes be found even in the absence of a (known) family history. As with

other FMD presentations, symptoms can occur in isolation or in combination [5, 6].

Clinical Vignette: Part II

During her hospital stay, Mrs. P. continued to experience weakness in her left arm and leg. A follow-up neurological examination showed a positive Hoover's sign on the left leg (patient was not able to flex this leg when tested, but the leg exerted a strong downward force when the right leg was flexed in the hip), a new postural tremor in her left arm that was entrainable, and variable and distractible stuttering speech that was particularly evident during bedside language testing. She was diagnosed with FMD, including features of functional limb weakness, functional tremor and functional speech. This was described to her as real, common and treatable, and that one way of understanding this condition is that her "hardware" (brain scan) is generally healthy but her "software" is crashing. She produced a spontaneous laugh with this discussion, in part because she commented that her late husband used to help her with her home computer that was "always crashing". A physical therapist was asked to see the patient for an initial evaluation while in the hospital. The patient initially showed very little movement of her arm and leg and expressed frustration about the severity of her physical symptoms.

She was given educational materials about FMD and a social worker from the geriatrics service was asked to see the patient. Details emerged that she was having difficulties caring for herself in her large two-story home since the passing of her husband from cancer the year prior. There were also ongoing family disagreements related to financial issues, causing an emotional strain between the patient and her two daughters.

Over the course of the next several days, she was able to make considerable progress in physical therapy with the use of distraction techniques and regained use of her leg to a sufficient degree for independent ambulation. The social worker continued to meet with the patient daily to provide emotional support. She was accepted to a sub-acute rehab program and the educational materials gathered by the primary team were

shared with the rehabilitation facility to ensure adequate continued care. The patient's primary care physician was informed of the admission, an outpatient social work appointment was arranged through the primary care's office and neurology follow up was also scheduled. When seen on neurology follow-up a month later, she had recovered back to her baseline function and was planning to relocate to an assisted living facility to simplify her daily life and responsibilities in caring for a large property.

Special Treatment Considerations for FMD in Older Adults

To date, there is no standard protocol available for treating FMD in elderly and geriatric patients. In several retrospective studies [18, 19] reporting on treatment outcomes in patients with FMD undergoing intensive multidisciplinary treatment programs, age was not found to be a predictive factor. A 1-week physiotherapy program based on the concept of motor reprogramming compared sixty patients ranging from age 17–79 to a control group undergoing standard medical care. Substantial improvement or remission of motor symptoms was reported in 74% of patients, and patient-rated outcomes after 2 years continued to show benefit in 60% compared to 22% in the control group, independent of age [20].

A specific and goal-oriented multidisciplinary geriatric team treatment approach can lead to relevant improvements in outcome parameters in both FMD and comorbidities [2]. Participation of different individualized interventions with input from neurologists, mental health providers and rehabilitation specialists (i.e., speech therapist, occupational therapist, physical therapist) are considered best practice for optimizing treatment outcomes.

As for other age groups, treatment for FMD needs to be individualized and adjusted to a patients' unique sets of predisposing, precipitating and maintaining factors (core components of the biopsychosocial model). Psychoeducation, teaching relaxation and mindfulness, as well as addressing adverse family dynamics can be very

helpful as presented in our vignette. According to our clinical experience, a comprehensive assessment by a multidisciplinary geriatric team including a movement disorders neurologist, geriatrician, neuropsychologist (or geriatric/neuropsychiatrist), physiotherapist, occupation therapist, speech therapist and social worker are crucial. With this approach the opportunity to clarify (i) to what extent the patient has an FMD diagnosis, (ii) how this is associated with other medical/neurological diagnoses and which of the diagnoses is most disabling in terms of health-related quality of life, (iii) the level of patient acceptance (or potential acceptance) of the diagnosis, and (iv) to work out the details of a patient-centered treatment plan is higher. Especially point (iii) has to be implemented thoughtfully. Explaining the diagnosis to patients and families should be done in an empathetic manner, validating the patient's symptoms, and explaining how the diagnosis was reached. We often use analogies such as "FMD is like a computer problem where some of the software has been lost or programmed with a part that doesn't belong to the original software" to describe the disorder. "Your brain is stuck in a wrong gear and needs to be retrained on how to get un-stuck" may be another helpful analogy. The explanatory model should be adjusted according to the patient's educational and cultural background. Explaining FMD in terms of temporary brain dysfunction similar to what many of us have experienced during times of high stress or anxiety (e.g. "he was paralyzed with fear") can often help to normalize the diagnosis. Using functional terms and giving hope for a path forward and reversibility of symptoms with treatment are other important strategies. For more details on delivering a diagnosis of FMD, see Chap. 17. When a diagnosis of FMD is presented in this manner, most patients will express interest in further information and treatment for their problems. If there is no interest by of the patient to be referred for FMD treatment services, we nevertheless write the diagnosis in unambiguous terms in the patient's medical chart, inform the patient and the family as well as the referring provider

about our assessment of the symptoms, and remain available for further questions and advice.

In patients with cognitive impairment or dementia, the treatment approach may need to be modified and rely on reassurance and behavioural modifications by the patient's partner and other family members rather than insight-oriented or skill-based psychotherapy. Common comorbidities such as chronic pain or insomnia often worsen FMD symptoms and need to be addressed as part of a comprehensive treatment plan.

In light of the increasing recognition of FMD as source of disability in older adults, and the expected rise in affected patients due to increasing life expectancy, further research on understanding and treating FMD in older adults is urgently needed.

Geriatricians, other primary care providers, neurologists, mental health professionals, physical, occupational, and speech therapists should all work together to design both efficient diagnostic approaches and patient-centered treatments for FMD in older adults. As health care professionals gain more awareness of FMD, special considerations towards meeting the needs of older patients should be emphasized.

Summary

- Approximately 20% of patients with FMD may have onset of symptoms after the age of 60 years, and many of those developing FMD earlier in life remain symptomatic as they get older.
- In older patients, FMD is often comorbid with other neurological disorders, and may be precipitated by a physical injury, surgery or stroke.
- Precipitating psychosocial factors for FMD in older adults include changes in relationships, difficult dynamics with adult children, fear of dying, financial problems, spouse's illness or death, loneliness, establishing a new sense of purpose and identity after retirement.

- Tremor and gait disorders are the most commonly encountered symptoms of FMD in older adults.
- Treatment needs to be individualized and is often best delivered in a multidisciplinary approach, addressing relevant comorbidities, precipitating and maintaining factors such as deconditioning, chronic pain and insomnia.
- Older age has not been shown to be a negative predictive factor towards treatment success in FMD, and treatment can often lead to rewarding outcomes for patients and families.

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