Chapter 7
Geriatric Syndromes

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Key Points

- Geriatric syndromes are multifactorial health conditions occurring when the accumulated effects of impairments in multiple systems render an older person vulnerable to situational challenges.
- The identification, removal, or prevention of the multiple causes that determine the geriatric syndromes is mandatory to construct an appropriate prevention and/or intervention program.
- Falls and delirium are the most frequent and disabling geriatric syndromes in older patients with human immunodeficiency virus (HIV) and are associated with increased mortality, morbidity, and disability.

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7.1 Definition

Geriatric syndromes are defined as multifactorial health conditions that occur when the accumulated effects of impairments in multiple systems render an older person vulnerable to situational challenges [1]. Geriatric syndromes, therefore, require special clinical considerations: firstly, for a given geriatric syndrome, multiple risk factors and multiple organ systems are often involved; secondly, diagnostic strategies to identify the underlying causes can sometimes be ineffective, burdensome, dangerous, and costly. Finally, therapeutic management of the clinical manifestations can be helpful even in the absence of a firm diagnosis or a thorough understanding of the underlying causes. Current studies support the presence of interaction between HIV and geriatric syndromes. Data also indicates that treatment of comorbidities and the early initiation of antiretroviral therapy (ART) may help to prevent the development of these conditions [2].

In this chapter we describe in detail two geriatric syndromes that are frequently found in both HIV-negative and HIV-positive older patients: falls and delirium. Other examples of common geriatric syndromes include malnutrition, loss of consciousness, pressure sores, and sleep disturbances.

7.2 Falls

7.2.1 Overview

Falls are defined as a sudden involuntary event, resulting in a person coming to rest on the ground or lower level from a higher level [3]. Falls are responsible for considerable morbidity, immobility, and mortality among older persons, leading to an increased risk of hospitalization and institutionalization, with prolonged recovery periods, and resulting in an increase in disability and health care costs [4]. Falls result from an interaction of multiple and diverse risk factors and situations.

This interaction is modified by age, disease, and by the environment. Proper management of this health problem has strong clinical and economic relevance. An appropriate assessment of the elderly at risk of falling and the implementation of an effective treatment plan after the event is an important principle of care [5]. Among the most serious consequences of a fall is a fracture, particularly hip fracture, which may lead to disability, poor quality of life (QOL), and death. Falls are a common geriatric syndrome in patients with HIV [6], therefore, careful attention should be given to the assessment and the intervention of this condition.

7.2.2 Causes of Falls

The recognition of the etiology of a fall, wherever possible, is important in order to prevent a repeat episode, the risk of which is increased after a first fall, and possibly a disabling fracture or injury such as a traumatic brain injury or minor concussive event. In older patients, falls are typically multifactorial; in an individual patient many predisposing and precipitating factors may coexist.

Causes of falls can be categorized into those with predisposing intrinsic conditions (due to the subject) (Table 7.1) and extrinsic conditions (due to the environment) (Table 7.2). Intrinsic causes can be divided into age-related physiological changes (Table 7.1a) and pathological predisposing conditions (Table 7.1b) [7]. Intrinsic predisposing conditions, with particular regards to neurological and psychiatric disease, occur with high prevalence in patients with HIV, making this population particularly vulnerable to falls.

7.2.3 Assessment

Older people with HIV who present for medical attention because of a fall, report recurrent falls in the past year, or demonstrate abnormalities of gait and/or balance should be offered a multifactorial falls risk assessment, preferably by a

health care professional with appropriate skills and experience. This assessment should be part of an individualized multifactorial intervention [8]. Multifactorial assessment should include:

- identification of fall history;
- assessment of gait, balance, and mobility;
- assessment of osteoporosis risk;
- assessment of the person's perceived functional ability and fear relating to falling;
- assessment of visual impairment;
- assessment of cognitive impairment and neurological examination;
- assessment of urinary incontinence;
- assessment of home hazards;
- cardiovascular examination; and
- medication review.

Table 7.1 Intrinsic predisposing conditions

a. Age-related physiologic changes

Sight:
- Reduction in visual acuity
- Reduction in ability to accommodate
- Reduction in discriminative capacity for colors
- Reduction in tolerance to glare
- Presbyopia and myopia

Hearing:
- Reduced perception of pure tones
- Reduced discrimination capability between sounds at different frequency and distance
- Reduced discrimination capability between contemporary voices in conversation

Musculoskeletal:
- Sarcopenia
- Reduced muscle strength
- Reduced range of movement

Central nervous system:
- Deficient tactile sensitivity, vibration sense, thermal sensitivity
- Increase in postural sway with instability
- Alterations in the integration of sensory inputs and motor responses causing increased time of reaction
- Alterations of balance

(continued)

Table 7.1 (continued)

b. Predisposing factors

Cardiovascular:
- Myocardial infarction
- Orthostatic hypotension
- Arrhythmias
- Valvular disease
- Flebopathy/venous insufficiency
- Syncope
- Dizziness

General medicine and endocrine:
- Hypoglycemia
- Hypokalemia
- Thyroid disease
- Hypo and hypernatremia
- Dehydration
- Hyperventilation
- Anemia

Musculoskeletal:
- Myopathies
- Degenerative joint disease
- Vertebral deformities
- Pathological fractures
- Sarcopenia

Neurological:
- Dementia
- Stroke
- Transient ischemic attack
- Parkinson's disease
- Carotid sinus hypersensitivity
- Vestibular system pathology
- Delirium
- Epilepsy
- Neuropathy

Gastrointestinal:
- Diarrhea
- Bleeding

Psychiatric:
- Depressive syndromes
- Anxiety syndromes
- Fear of falling

Genitourinary:
- Urinary incontinence
- Post-micturition hypotension

Iatrogenic:
- Drug side effects
- Polypharmacy and drug–drug interactions
- Immobilization

Adapted from Pasquetti et al. [7]

7.2.4 *Intervention*

All older people with recurrent falls or who are assessed as being at increased risk of falling should be considered for an individualized multifactorial intervention to identify and address future risk and individualized intervention aimed at promoting independence and improving physical and psychological function [8]. In successful multifactorial intervention programs specific components should be evaluated. Strength and balance should be assessed and in the case of balance and gait deficit a muscle-strengthening and

Table 7.2 Extrinsic risk factors

Extrinsic risk factors
• Obstacles
• Inadequate ambient lighting
• Inadequate footwear and clothing
• Uneven or slippery floors
• Presence of steps
• Lack of handrails
• Inadequate height of beds
• Inadequate chairs
• Inadequate bathroom
• Unfamiliar environment

Adapted from Pasquetti et al. [7]

balance program should be individually prescribed and monitored by an occupational therapist or appropriately trained professional.

Home hazard assessment and intervention should be carried out by health care professionals involved in the assessment and prevention of falls and should discuss what changes a person is willing to make to prevent falls (discussing vision assessment, referral, and medication review). Older people on medications, especially those on cardiovascular and psychotropic drugs, should have their medication reviewed, with specialist input if appropriate, and discontinued if possible to reduce their risk of falling.

To promote the participation of older people in falls prevention programs the following should be considered:

- In hospitalized patients home hazard assessment and intervention should be considered at the time of a discharge planning and be carried out within a timescale agreed by the patient or care giver. Home hazard follow-up evaluations are needed.

- Falls prevention programs should address potential barriers, such as low self-efficacy and fear of falling, and encourage activity change as negotiated with the participant.

Practitioners who are involved in developing falls prevention programs should ensure that such programs are flexible enough to accommodate the different needs and preferences of the participants and should promote the social value of such programs.

7.3 Delirium

7.3.1 Overview

Delirium is defined as a transient, usually reversible, sudden cause of cerebral dysfunction and manifests clinically with a wide range of neuropsychiatric abnormalities. It can occur at any age, but is more common in elderly patients. It affects 14–46 % of hospitalized older patients [9], 50 % of postoperative older patients [10], and occurs in up to 80 % of patients in the intensive care unit [11]. The point prevalence of delirium in hospitalized patients with acquired immunodeficiency syndrome (AIDS) is estimated to be between 30 and 40 % [12]. Delirium is independently associated with several adverse outcomes, including elevated in-patient costs, increased length of stay, long-term cognitive and functional decline, increased risk of institutionalization, higher mortality, as well as patient and care giver distress. The timely recognition of delirium can improve outcomes. However, 50–75 % of delirium is undetected or misdiagnosed in acute-care hospitals [13].

Delirium is the most common neuropsychiatric complication of hospitalized patients with HIV. In these patients, delirium presents with the same clinical features as in non-HIV-infected individuals. Typically, delirium is multifactorial in etiology and a complete evaluation to rule out all treatable and reversible medical conditions should be the first stage in the approach to a delirious patient with AIDS [12].

7.3.2 Diagnostic Criteria

The diagnosis of delirium is clinical and no specific laboratory test can be used. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) identifies the following diagnostic criteria [14]:

- Disturbance in attention (ie, reduced ability to direct, focus, sustain, and shift attention) and awareness.
- Change in cognition (ie, memory deficit, disorientation, language disturbance, perceptual disturbance) that is not better accounted for by a pre-existing, established, or evolving dementia.
- The disturbance develops over a short period (usually hours to days) and tends to fluctuate during the course of the day.
- There is usually evidence from the history, physical examination, or laboratory findings that the disturbance is caused by a direct physiologic consequence of a general medical condition, an intoxicating substance, medication use, or more than one cause.

7.3.3 Causes of Delirium

In immunocompromised patients with AIDS, delirium may be associated with opportunistic infection of the central nervous system (CNS) (eg, HIV, cytomegalovirus, toxoplasmic encephalitis) as well as systemic infection (eg, hypoxia associated with *Pneumocystis* pneumonia). However, in patients with satisfactory immunological control secondary to highly active antiretroviral therapy (HAART), delirium is more commonly associated with toxicity related to polypharmacy, HIV-related cerebrovascular disease, and psychoactive drug withdrawal or intoxication [15].

Patients with HIV/AIDS are also vulnerable to fluctuations in blood metabolites, particularly in cirrhotic patients

co-infected with hepatitis C virus (HCV), as well as sudden changes in hydration status.

7.3.4 Types of Delirium

Delirium subtypes have been defined based on the presence (hyperactive) or absence (hypoactive) of psychomotor agitation, perceptual disturbances, and/or changes in level of consciousness. Often both subtypes are present concurrently (mixed). The hypoactive form is the most difficult to detect, since the patient is confused, but calm, and does not call attention from nurses and/or physicians [16].

7.3.5 Assessment Instruments

Several screening tools have been evaluated to assess delirium. The Confusion Assessment Method (CAM) and 4 As test (4AT) in particular display high sensitivity and specificity, and allow for the characterization of delirium features.

The CAM [17] was originally developed by literature review and expert consensus, and was validated against the reference standard ratings of geropsychiatrists based on the DSM Third Edition Revised (DSM-IIIR) criteria. The CAM was designed to allow non-psychiatric clinicians to diagnose delirium quickly and accurately following brief formal cognitive testing (Table 7.3). CAM delirium diagnosis requires the presence of features 1 and 2 and either 3 or 4.

The 4AT is a new screening tool for delirium and is available at www.the4AT.com. It incorporates two simple cognitive screening items. This screening test shows the following advantages [18]:

- brevity (generally <2 min);
- no special training required;
- simple to administer (including in people with visual or hearing impairment);
- does not require physical responses;

- good for assessment of 'untestable' patients (those who cannot undergo cognitive testing or interview because of severe drowsiness or agitation); and
- incorporates general cognitive screening to avoid the need for separate tools for delirium and other causes of cognitive impairment.

7.3.6 Management

The goal of treatment is to identify the often multifactorial causes of the delirium and to stop, control, or reverse them. Components of delirium management include supportive therapy and pharmacologic management. Fluid and nutrition should be given carefully because the patient may be unwilling or physically unable to maintain a balanced intake; older patients may be unable to swallow safely (putting themselves at risk for aspiration). For the older patient suspected of having alcohol toxicity or alcohol withdrawal, therapy should include thiamine and careful use of benzodiazepines when indicated, usually in lower doses than in younger adults [19]. Reorientation techniques or memory cues such as a calendar, clocks, and family photos may be helpful. The environment should be stable, quiet, and well-lit. Delirium that causes injury to the patient or others should be treated with medications. The most common medications used are atypical short-acting neuroleptics. The careful use of benzodiazepines should be reserved for drug withdrawal states [20].

7.4 Conclusion

The detection of geriatric syndromes in older patients with HIV is of paramount importance, since the prompt recognition of the often multifactorial causes and the prompt initiation of preventive and therapeutic interventions is able to reduce mortality and, most importantly, disability in patients with HIV.

Table 7.3 The Confusion Assessment Method [17]

Feature 1	Acute onset and fluctuating course	This feature is usually obtained from a family member or nurse and is shown by positive responses to the following questions: • Is there evidence of an acute change in mental status from the patient's baseline? • Did the (abnormal) behavior fluctuate during the day, that is, tend to come and go, or increase and decrease in severity?
Feature 2	Inattention	This feature is shown by a positive response to the following question: • Did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?
Feature 3	Disorganized thinking	This feature is shown by a positive response to the following question: • Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?
Feature 4	Altered level of consciousness	This feature is shown by any answer other than 'alert' to the following question: • Overall, how would you rate this patient's level of consciousness? (alert [normal], vigilant [hyperalert], lethargic [drowsy, easily aroused], stupor [difficult to arouse], or coma [unarousable])

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