South African Family Practice 2019; 61(6):10-14

S Afr Fam Pract
ISSN 2078-6190 EISSN 2078-6204

REVIEW

Treating complexity in the older adult - the role of the geriatric giants

L Greenstein,[1] A Abraham,[2] B Tipping[2]

[1] Division of Geriatric Medicine, Helen Joseph Hospital, University of the Witwatersrand, South Africa
[2] Division of Geriatric Medicine, Donald Gordon Medical Centre and Helen Joseph Hospital, University of the Witwatersrand, South Africa
Corresponding author, email: greensteinlara@gmail.com

As people age, they accumulate medical conditions. Geriatric giants comprise a group of conditions that lead to significant mortality and morbidity and contribute to the complexity in treating geriatric patients. They are common and rarely occur in isolation. The 5 Is of geriatric giants are: iatrogenesis, immobility, instability, incontinence and impaired cognition. Consequences for the patient and their caregivers include loss of functional independence, institutionalisation and caregiver burnout. Primary care practitioners are often the first port of call for geriatric patients in South Africa and by asking a few key questions and performing a thorough examination; these conditions can be recognised early. Whilst there are often limitations to cure, the main aim is to maintain the older adult's functional independence as much as possible, and by following an organised management approach to each of these conditions, the quality of life of patients can be improved.

Keywords: Geriatric giants, iatrogenesis, immobility, instability, incontinence, impaired cognition

Introduction

Older people seldom have one medical condition; instead they have multiple problems which impact on one another. Therefore, it is useful to focus on the geriatric syndromes rather than individual diseases in the more complex geriatric patient. In 1965, Bernard Isaacs coined the term "geriatric giants" or the 5 Is to describe these syndromes: instability, immobility, iatrogenesis, impaired cognition and incontinence.[1,2] The cornerstone of evaluation and management of older persons is encompassed in comprehensive geriatric assessment (CGA). CGA is centred in a biopsychosocial model and recognises that older persons are more than an isolated biomedical problem. Their complex psychosocial and environmental situations need to be incorporated into individualised patient-centred contextual care. Such care may frequently be at odds with single disease specific management guidelines. This review article aims to shed light on the important questions to ask during the geriatric patient assessment, as well as to provide a framework for the management of each condition.

Iatrogenesis

"*Primum non nocere*" is one of the fundamental bioethical principles in medicine,[3] however we often unwittingly do great harm to our patients. Adverse drug events (ADE), which are prevalent both locally and internationally, account for the majority of iatrogenic injuries.[4-6] An adverse drug event (ADE) is an injury resulting from the use of a drug at a normal dose.[7] Polypharmacy, the use of five or more medications,[8] or the use of more drugs than medically necessary, is causally implicated in the other geriatric giants and leads to an increase in hospitalisation, drug-drug interactions, decreased compliance and functional decline.[4] Unfortunately, older individuals are prone to ADE as a function of their physiology and comorbidities.[5,9] Doctors themselves can cause iatrogenesis from both invasive procedures and from doing tests that are not indicated in that particular patient.

The commonest drug classes implicated are warfarin, cardiovascular agents, antiplatelet medication, insulin and oral hypoglycaemic agents.[4,10] Drugs with anticholinergic properties are problematic for a number of reasons – they predispose to falls, urinary retention, dizziness and cause confusion and behavioural problems in patients with dementia.[11]

It would be impossible to remember every drug's side effects and interactions. Two very easy to use tools exist to help doctors decide which medications are potentially inappropriate medications (PIMS) – the Beers Criteria and the STOPP/START criteria.[12,13] At each visit, medications should be reviewed and de-prescribed, if non-beneficial. New medication should be added with caution with cognisance of the potential interactions with other medicines and concomitant diseases.[5] Even a small decrease in the anticholinergic drug burden can significantly decrease adverse drug events.[11] Patients with cognitive dysfunction and visual impairment would benefit from a biopsychosocial approach, including simplified medication regimes, help with the administering of medicines by family members, including the use of pill boxes, and the use of blister packs by pharmacies.[14] The adage "less is more" should be applied when prescribing for the older person.

Immobility

Immobility is particularly problematic because of the detrimental consequences associated with it: functional decline, disability, dependence and mortality.[15,16] Immobility is not a natural part of aging. The physical complications of immobility affect every organ system and commonly include loss of muscle mass, deep vein thrombosis, atelectasis and pneumonia, constipation

and pressure ulcers.[17] The mental and social consequences of immobility dramatically impair quality of life and increase care burden. The risk factors for immobility and instability, which if found can sometimes be treated early to prevent complications, can be found in Table 1.

Table 1. Risk factors for immobility and instability

Joint pathology – osteoarthritis of the knees and hips
Foot pathology – structural abnormalities, pain
Cognitive impairment – confusion, severe depression, medication use
Gait abnormalities – neuropathy, neurology
Vestibular disorders
Muscle weakness and sarcopenia
Visual impairment
An unsafe environment
Fear of falling

No simple solution exists and the treatment of immobility requires a multidisciplinary team. The caregivers are integral in the prevention of complications and allied health professionals help with rehabilitation, activities of daily living and mobilisation.

All non-essential medications that contribute to immobility and muscle weakness should be stopped. Nutritional support and hydration is paramount, as is treating constipation and urinary retention if present.[16,18] Meals should be eaten out of bed or at least in a sitting position to prevent aspiration. Deep vein thrombosis prophylaxis at home or in a frail care centre can be achieved with compression stockings.[18] Pressure ulcers (PU) are one of the most feared consequences of immobility. Prevention of PU is better than cure and the aim is to minimise the extrinsic risk factors: moisture, pressure and friction. Moisturising lotions, a toileting schedule, or adult continence dignity garments, and the use of pressure reducing devices such as mattresses and pressure cushions can help and are relatively easily implemented at home.[19,20] Patients who are bed-bound should be repositioned every two hours, those in wheelchairs hourly, and those who can self-reposition, every 15 minutes.[19,20] Adequate nutrition is important but there is no evidence that enteral feeding improves bedsores in cognitively impaired patients.[21]

Immobility is often the end-result of many different disease processes.[16] The aim is to prevent common complications and keep older patients as safely mobile as possible for as long as possible. Exercise is the best strategy to prevent immobility. Strength and balance training by the physiotherapist is of utmost importance and once this has been achieved, tai-chi has been shown to be beneficial.[16]

Incontinence

The prevalence of urinary incontinence (UI) in the geriatric population is 15–30%.[22] General practitioners are often the first doctors to address such issues. UI is associated with complications such as pressure ulcers, urinary tract infections, falls with fractures and depression, which negatively impact quality of life, social wellbeing and over-all health.[23] Often, the patient feels anxious and embarrassed about the incontinence and this causes distress and social isolation.[24] Taking a good history that focuses on the pattern of incontinence, frequency, severity and duration is paramount. Focus should be on how the incontinence affects everyday life and the impact on their social activities. Thereafter, a thorough physical examination followed by urine analysis and measurement of post void residual urine volume is required. Discussion about control versus cure is paramount. Cure is often not possible in the face of multiple comorbidities and patient expectations need to be addressed and managed in this context.

Table 2. Types of incontinence and interventions[24-28]

Type	Presentation	Interventions
Stress incontinence - raised intra-abdominal pressure	Incontinence with straining, sneezing, laughing	Stop smoking Treat constipation Kegel exercises Devices – electrical stimulation Surgery may be an option Duloxetine (SNRI antidepressant)
Urge incontinence – detrusor muscle over activity	Unable to hold in urine after feeling an urge to urinate	Behavioural therapy or bladder retraining – timed voiding every 2 to 3 hours Keeping a bladder diary Biofeedback – using stimulus to inhibit bladder contraction Pharmacotherapy: Alpha blockers Mirabegron Anticholinergic medicines (best avoided) Neuromodulation Surgery
Overflow incontinence	Outlet obstruction from a large prostate presents with lower urinary tract symptoms. A spinal cord lesion, neuropathy or previous stroke will have associated neurological signs	May benefit from intermittent catheterisation if present Treat enlarged prostate
Functional incontinence	Unable to reach the toilet due to physical or cognitive impairment and no structural urogenital problems	Try treat the underlying causes Use a commode if mobility issues, make the bathrooms mobility aid accessible Incontinence garments

Differentiating between the four main types of incontinence helps in directing appropriate therapy. Table 2 shows the types of incontinence and treatment strategies.

General management involves the exclusion of reversible causes such as delirium, infection, atrophic vaginitis, hyperglycaemia and stool impaction. Pharmacological agents that affect urinary function include antihypertensive agents, diuretics, antipsychotics, tricyclic antidepressants, anticholinergics and opiates.[27] Useful strategies include using vaginal oestrogen cream for atrophic vaginitis, stool softeners for constipation and treating urinary tract infections, avoiding alcohol and caffeinated drinks, decreasing nocturnal fluid intake and wearing protective pads.[28]

Instability

In the developed world 30–40% of people over the age of 65 will suffer a fall each year.[29] In South Africa, the prevalence of falls is 26.4%.[30] Falls are associated with significant morbidity and mortality[31] and can lead to detrimental physical, psychological and social consequences.[32]

Risk factors for falls include muscle weakness, a history of falls, gait and balance abnormalities, the use of assistive devices, visual deficits, musculoskeletal comorbidities, impaired cognition and advanced age.[31]

Geriatric patients should be screened for falls risk annually. If a patient has fallen, balance and gait must be assessed which is easily done with the timed up and go test. The patient is timed while rising from a chair, walking 3 meters, turning around, walking back, and sitting down.[33] See Table 3 for a step approach to the falling patient.[31]

Table 3: The falls risk assessment

Step 1	Ask annually about falls
Step 2	1 fall – perform a timed up and go test
Step 3	If step 2 is abnormal or there have been 2 or more falls, perform a full risk assessment. Important components are: • History of the fall circumstances • Medication review • A physical examination including musculoskeletal, foot, shoe and gait exam, cardiovascular exam and a neurological exam

The main aim of falls prevention is to maintain mobility without injury. Multifactorial interventions are more effective than single component interventions. The biopsychosocial or comprehensive geriatric assessment approach is best implemented in preventing falls. This is best done by exercise training, focusing on strength and balancing training, review of medications, treatment of correctable risk factors, training on assistive devices if necessary, and environmental modification.[34] Environmental hazards such as loose carpets and obstructions on the floor should be removed. Any modifiable risk factors should be corrected. Vitamin D supplementation is helpful only in those who are deficient.[34] Medications are a modifiable risk factor and those most often implicated in falls are antidepressants, sedatives or hypnotics, and anti-epileptics.[35] Cataract surgery on the first eye should be expedited. Postural hypotension is potentially treatable and should form part of routine examinations. Patients with cardio-inhibitory carotid sinus hypersensitivity may require a pacemaker.[34]

A multidisciplinary approach is always optimal and enlisting the help of allied health professionals is important. The family plays an important role and can help by ensuring a safe environment free from hazards that can cause trips and slips, installation of rails in bathroom areas and by creating enough space for mobility devices to be used in the home.

Impaired cognition

This geriatric giant encompasses delirium, an acute medical emergency; dementia representing chronic cognitive impairment; as well as depression. Acute onset of confusion always requires urgent comprehensive assessment. Dementia refers to confusion that is less acute, generally being present for longer than 6 months. The prevalence of dementia is increasing as the population ages.[36] Dementia is a blanket term for different subtypes of which Alzheimer's is the most common. The definition of dementia or major neurocognitive deficit, according to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM V) (see Table 4), is classified along a continuum from mild to severe.[37] If there is no impedance to function, the condition is termed mild cognitive impairment.

Table 4: The DSM V criteria for major neurocognitive disorder

A: Evidence of a significant cognitive decline from a previous level of performance in one or more of the cognitive domains.
B: The cognitive deficits are sufficient to interfere with independence in activities.
C: The cognitive deficits do not occur exclusively in the context of a delirium.
D: The cognitive deficits are not primarily attributable to another mental disorder.

To reduce the incidence of dementia, a number of strategies can be employed. Hypertension should be treated in middle age. Younger people should exercise, be socially active, not smoke, and manage comorbid conditions such as obesity, diabetes, depression and hearing loss.[36]

Cognitive testing can take time, which busy general practitioners often do not have.[38] The clinical consequences of missing cognitive impairment, however, offset this assumption. The mini-cog is a screening test that is quick and easy to administer in a primary care setting. The mini-cog consists of a three item recall and a clock drawing test.[39] When compared to the Folstein Mini Mental State Exam (MMSE) for dementia detection in a multi-ethnic setting, the mini-cog detected 84% of cases while the MMSE detected only 81% of cases.[40] If the mini-cog is abnormal, the MMSE can also be administered. Confused older persons should always undergo comprehensive evaluation.

Conditions that hamper cognition and may be reversible and treatable must always be sought. These include chronic subdural hematomas, hypothyroidism, vitamin B12 deficiency, certain electrolyte abnormalities, vasculitis, sepsis, normal pressure

hydrocephalus and, importantly, inappropriate medication use. These should be asked about and managed if present.[41,42] Neuro-imaging is most useful in those patients with atypical presentations or neurological signs.[43]

Treatment depends on the type of dementia but in general, the biopsychosocial model should be used. This includes a supportive structured environment which encompasses the family or caregiver helping with a daily routine, activities of daily living and social interactions. For those with Alzheimer's dementia, cholinesterase inhibitors in early stages and memantine in later stages may be beneficial.[36] The behavioural and psychological symptoms of dementia may be particularly challenging and require a multidisciplinary team approach lead by the general practitioner. Psychosocial and environmental management identifying behavioural triggers, carer education and measures to prevent carer burnout are first line. Second line options include very cautious use of antidepressants, analgesics and low dose antipsychotics.

Conclusion

The geriatric giants have serious consequences for the patients and their caregivers. Assessing these giants early in a GP setting could lead to earlier recognition of these important syndromes and the implementation of strategies to keep older individuals independent for longer.[44,45] The GP has the prime role as the coordinator of care for this vulnerable population as the GP has a bond with the patient and family and can advocate for the best care possible.

Disclosure of interest

The authors report no conflicts of interest.

Acknowledgements

We declare that we have no financial or personal relationship(s) which may have inappropriately influenced the writing of this paper.

References

1. Lakhan P, Jones M, Wilson A, Courtney M, Hirdes J, Gray LC. A prospective cohort study of geriatric syndromes among older medical patients admitted to acute care hospitals. J Am Geriatr Soc. 2011;59:2001-8.
2. Morley JE. The Importance of Geriatric Syndromes. Mo Med. 2017;114: 99-100.
3. Beauchamp TL, Childress JF. Principles of biomedical ethics. New York: Oxford University Press, 2001.
4. Maher RL, Hanlon J, Hajjar ER. Clinical consequences of polypharmacy in elderly. Expert Opin Drug Saf. 2014;13:57-65.
5. Lavan AH, Gallagher P. Predicting risk of adverse drug reactions in older adults. Ther Adv Drug Saf. 2016;7:11-22.
6. Tipping B, Kalula S, Badri M. The burden and risk factors for adverse drug events in older patients--a prospective cross-sectional study. S Afr Med J. 2006;96:1255-9.
7. Nebeker JR, Barach P, Samore MH. Clarifying adverse drug events: a clinician's guide to terminology, documentation, and reporting. Ann Intern Med. 2004;140:795-801.
8. Gnjidic D, Hilmer SN, Blyth FM, et al. Polypharmacy cutoff and outcomes: five or more medicines were used to identify community-dwelling older men at risk of different adverse outcomes. J Clin Epidemiol. 2012;65:989-95.
9. Laatikainen O, Sneck S, Bloigu R, Lahtinen M, Lauri T, Turpeinen M. Hospitalizations Due to Adverse Drug Events in the Elderly-A Retrospective Register Study. Front Pharmacol. 2016;7:358.
10. Budnitz DS, Lovegrove MC, Shehab N, Richards CL. Emergency hospitalizations for adverse drug events in older Americans. N Engl J Med. 2011;365:2002-12.
11. Jaidi Y, Guilloteau A, Nonnonhou V, et al. Threshold for a Reduction in Anticholinergic Burden to Decrease Behavioral and Psychological Symptoms of Dementia. J Am Med Dir Assoc. 2019;20:159-64.e3.
12. O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C, Gallagher P. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age Ageing. 2015;44:213-8.
13. American Geriatrics Society 2019 Updated AGS Beers Criteria(R) for Potentially Inappropriate Medication Use in Older Adults. J Am Geriatr Soc. 2019;67:674-94.
14. Elliott RA, Goeman D, Beanland C, Koch S. Ability of older people with dementia or cognitive impairment to manage medicine regimens: a narrative review. Curr Clin Pharmacol. 2015;10:213-21.
15. Hirvensalo M, Rantanen T, Heikkinen E. Mobility difficulties and physical activity as predictors of mortality and loss of independence in the community-living older population. J Am Geriatr Soc. 2000;48:493-8.
16. Tan TL, Ding YY, Lee A. Impaired mobility in older persons attending a geriatric assessment clinic: causes and management. Singapore Med J. 2001;42:68-72.
17. Corcoran PJ. Use it or lose it--the hazards of bed rest and inactivity. West J Med. 1991;154:536-8.
18. Laksmi PW, Harimurti K, Setiati S, Soejono CH, Aries W, Roosheroe AG. Management of immobilization and its complication for elderly. Acta Med Indones. 2008;40:233-40.
19. White-Chu EF, Flock P, Struck B, Aronson L. Pressure ulcers in long-term care. Clin Geriatr Med. 2011;27:241-58.
20. Thomas DR. Issues and dilemmas in the prevention and treatment of pressure ulcers: a review. J Gerontol A Biol Sci Med Sci. 2001;56:M328-40.
21. Teno JM, Gozalo P, Mitchell SL, Kuo S, Fulton AT, Mor V. Feeding tubes and the prevention or healing of pressure ulcers. Arch Intern Med. 2012;172:697-701.
22. Vaughan CP, Markland AD, Smith PP, Burgio KL, Kuchel GA. Report and Research Agenda of the American Geriatrics Society and National Institute on Aging Bedside-to-Bench Conference on Urinary Incontinence in Older Adults: A Translational Research Agenda for a Complex Geriatric Syndrome. J Am Geriatr Soc. 2018;66:773-82.
23. Coyne KS, Wein A, Nicholson S, Kvasz M, Chen CI, Milsom I. Comorbidities and personal burden of urgency urinary incontinence: a systematic review. Int J Clin Pract. 2013;67:1015-33.
24. Thakar R, Stanton S. Regular review: management of urinary incontinence in women. BMJ. 2000;321:1326-31.
25. Lightner DJ, Gomelsky A, Souter L, Vasavada SP. Diagnosis and Treatment of Overactive Bladder (Non-Neurogenic) in Adults: AUA/SUFU Guideline Amendment 2019. J Urol. 2019:558-63.
26. Fox C, Smith T, Maidment I, et al. Effect of medications with anti-cholinergic properties on cognitive function, delirium, physical function and mortality: a systematic review. Age Ageing. 2014;43:604-15.
27. Aoki Y, Brown HW, Brubaker L, Cornu JN, Daly JO, Cartwright R. Urinary incontinence in women. Nat Rev Dis Primers. 2017;3:17097.
28. Balk EM, Rofeberg VN, Adam GP, Kimmel HJ, Trikalinos TA, Jeppson PC. Pharmacologic and Nonpharmacologic Treatments for Urinary Incontinence in Women: A Systematic Review and Network Meta-analysis of Clinical Outcomes. Ann Intern Med. 2019.
29. Tinetti ME. Clinical practice. Preventing falls in elderly persons. N Engl J Med. 2003;348:42-9.
30. Kalula SZ, Ferreira M, Swingler GH, Badri M. Risk factors for falls in older adults in a South African Urban Community. BMC Geriatr. 2016;16:51.
31. Guideline for the prevention of falls in older persons. American Geriatrics Society, British Geriatrics Society, and American Academy of Orthopaedic Surgeons Panel on Falls Prevention. J Am Geriatr Soc. 2001;49:664-72.
32. Phelan EA, Mahoney JE, Voit JC, Stevens JA. Assessment and management of fall risk in primary care settings. Med Clin North Am. 2015;99:281-93.
33. Podsiadlo D, Richardson S. The timed "Up & Go": a test of basic functional mobility for frail elderly persons. J Am Geriatr Soc. 1991;39:142-8.
34. Summary of the Updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons. J Am Geriatr Soc. 2011;59:148-57.
35. Ming Y, Zecevic A. Medications & Polypharmacy Influence on Recurrent Fallers in Community: a Systematic Review. Can Geriatr J. 2018;21:14-25.

Full list of references available on request.

36. Livingston G, Sommerlad A, Orgeta V, et al. Dementia prevention, intervention, and care. Lancet. 2017;390:2673-734.
37. Association AP. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Washington, DC; 2013.
38. Olazaran J, Torrero P, Cruz I, et al. Mild cognitive impairment and dementia in primary care: the value of medical history. Fam Pract. 2011;28:385-92.
39. Borson S, Scanlan J, Brush M, Vitaliano P, Dokmak A. The mini-cog: a cognitive 'vital signs' measure for dementia screening in multi-lingual elderly. Int J Geriatr Psychiatry. 2000;15:1021-7.
40. Borson S, Scanlan JM, Watanabe J, Tu S-P, Lessig M. Simplifying detection of cognitive impairment: comparison of the Mini-Cog and Mini-Mental State Examination in a Multiethnic Sample. J Am Geriatri Soc. 2005;53:871-4.
41. Geldmacher DS, Whitehouse PJ Jr. Differential diagnosis of Alzheimer's disease. Neurology. 1997;48:S2-9.
42. Ogino A, Kazui H, Miyoshi N, et al. Cognitive impairment in patients with idiopathic normal pressure hydrocephalus. Dement Geriatr Cogn Disord. 2006;21:113-9.
43. Clarfield AM. The decreasing prevalence of reversible dementias: an updated meta-analysis. Arch Intern Med. 2003;163:2219-29.
44. Kane RL, Shamliyan T, Talley K, Pacala J. The association between geriatric syndromes and survival. J Am Geriatr Soc. 2012;60:896-904.
45. Weber P, Meluzinova H, Matejovska-Kubesova H, et al. Geriatric giants--contemporary occurrence in 12,210 in-patients. Bratisl Lek Listy. 2015;116:408-16.