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Review Article

An Overview of Health Screening for the Geriatric Age Group

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Abstract

Worldwide, the number of people aged 65 and over will increase from 702.9 million in 2019 to 1548.9 million in 2050, with a 120 percent increase between 2019 and 2050. As people age, their health care needs are likely to change and increase, resulting from the accumulation of chronic illnesses and age-related disabilities. A systematic approach is needed to diagnose, order and tackle all of these problems. For that, we performed an extensive literature search of the Medline, Cochrane, and EMBASE databases on 25 October 2019 using the medical subject headings (MeSH) terms "Geriatric Assessment" [Mesh]. Papers discussing screening tests for the geriatric age group were screened for relevant information. There were no limits on language, date or publication type. The first step in geriatric assessment is the functional ability, which refers to the performance of activities of daily living (ADL) and instrumental activities of daily living (IADL). This should be followed by assessing cognitive abilities, mental health, nutritional status, balance and risk of falling, sensory functions, and non-communicable disease (NCDs).

Keywords: *Geriatric; Screening; Assessment*

Introduction

Worldwide, the proportion of older people in the population is growing steadily. Worldwide, the number of people aged 65 and over will increase from 702.9 million in 2019 to 1548.9 million in 2050, with a 120 percent increase between 2019 and 2050 [1]. In western Asia, including Saudi Arabia, the most prominent increase is present with a 226 percent increase between 2019 and 2050 [1]. As people age, their health care needs are likely to change and increase, resulting from the accumulation of chronic illnesses and age-related disabilities [2]. This has a relatively strong effect on health care costs [3,4].

Multimorbidity, defined as the presence of two or more morbidities in one patient, is prevalent in 79% of people of 75 years and older [5-7]. Lower socioeconomic status (SES) and lower educational levels are associated with a higher prevalence and earlier occurrence of

multimorbidity [6,7]. Higher age and multimorbidity are associated with the presence of geriatric conditions, which are 'a collection of symptoms and signs common in older adults not necessarily related to a specific disease', for example, decreased ability to perform activities of daily living (functional impairment), cognitive impairment, delirium and falls [8-10]. Multimorbidity and geriatric conditions are associated with negative consequences, like higher mortality, functional decline and decreased quality of life [5-7].

For a patient with multimorbidity and geriatric conditions, daily life can be complex [11]. Complexity arises in case of an imbalance between the patient's capacities and the patient's workload of demands [11,12]. This workload exists in everyday life demands plus responsibilities of patient-hood, for family, and other priorities [13]. The patient's capacities exist of abilities, resources, and readiness to address demands, including physical and mental functioning, socioeconomic resources, social support, literacy, and spirituality [13]. From a medical point of view, patients with multimorbidity and geriatric conditions are complex for different reasons [11]. They pose many diagnostic and therapeutic choices, which take a lot of time, while time per patient is limited [14]. Evidence-based clinical practice guidelines generally focus on a single disease, so guidelines may be of little help [15]. Also, the health professional might miss conditions that interact with an acute or primary disease for which the complex patient is being treated, or which interfere with optimal outcome, or hospital discharge [16,17]. Furthermore, patients with multimorbidity are more likely to receive health care from several professionals, which increases the chances for miscommunication and fragmented care that again may result in negative consequences [5,6,12,18]. A systematic approach is needed to diagnose, order and tackle all problems. In this study, we review the different health screening strategies for the geriatric population.

Methods

We performed an extensive literature search of the Medline, Cochrane, and EMBASE databases on 25 October 2019 using the medical subject headings (MeSH) terms "Geriatric Assessment" [Mesh]. Papers discussing screening tests for the geriatric age group were screened for relevant information. There were no limits on language, date or publication type.

The comprehensive geriatric assessment

Due to the heterogeneity of the individual older patient, both in genetic predisposition, lifestyle and in multimorbidity and geriatric conditions, health professionals are challenged to determine which diagnostic procedures and treatments are most suitable [19,20]. According to Ellis., *et al.* and the Dutch CGA Guideline, patients with a combination of higher age, somatic disease, geriatric syndromes, functional decline, and social problems may benefit from a comprehensive geriatric assessment (CGA) because they are at risk of (further) functional impairment [10,21]. The CGA is a multidisciplinary, systematic diagnostic process to map the overall health status of older people, across somatic, psychological, functional and social domains, in order to develop a coordinated and integrated plan for treatment and follow up [10].

From the first introduction in the 1970s [22], many studies have supported its value in different settings [23,24]. It has been shown that the CGA and the associated treatment are effective in preventing functional impairment [15,25]. Besides, the CGA is useful in terms of patient-centered care, as it gives a comprehensive review of the patient's status, after which patient, caregiver, and health professional may discuss the patient's priorities and how these goals could be met best [26,27]. This patient-centered approach has several advantages. First, it focuses the discussion on outcomes that matter most to patients [27]. Second, this approach enhances shared-decision making because the patient is the key person to define the most important goals [27]. Regarding preferred outcomes in this (probably) last period of life, older patients consider maintaining independence, quality of life and other non-disease specific outcomes very important [26,28].

Assessment of the functional ability

The functional ability reefers to the performance of activities of daily living (ADL) and instrumental activities of daily living (IADL) [25,29]. ADL refers to self-care activities (e.g. eating, bathing, dressing, using toilet, micturition, and defecation… etc.), while IADL refers to the activities needed for independent living (e.g. preparing meals, taking medications, using telephone, housework… etc.) [29].

The geriatric assessment should start with assessing these two components in order to identify any functional impairment which can be a reflection for impending health problems [25,29,30]. This can help in taking early steps for tackling underlying conditions and preventing further deterioration of the function [25]. Items for the assessment of both components are presented in table 1 [25,31,32]. Noteworthy, problems in the IADL abilities have been associated with a higher risk of developing dementia during the next year of life [33].

ADL Assessment (Katz Index) [31]	IADL Assessment (Lawton Scale) [32]
Bathing	Use the telephone
Dressing	Use public transportation
Toileting	Do grocery shopping
Transferring (in-out of bed/chair)	Prepare meals
Continence (bladder, bowel)	Handle own medication
Eating	Handle finances
	Do housekeeping
	Do laundry

Table 1*: Assessment of ADL and IADL among geriatric population [25,29,31,32].*

Assessment of cognitive ability and mental health

Screening for dementia

There is a marked increase in the prevalence of dementia in proportion to age [34]. The prevalence of dementia in adults aged 90 years and above is about 30 to 40%, compared to only 5% in adults aged 65 to 70 years [34]. The screening for dementia is very important for the management of associated disorders like depression and irritability as early as possible [29]. Moreover, about 50% of dementia cases are diagnosed by physicians [35]. There are many tools for assessing cognitive functions; however, the Mini-cognitive assessment tool is the most appropriate for being small, accurate and convenient [29,36]. Moreover, this assessment tool can be finished within two to four minutes with appropriate specificity up to 93% and sensitivity up to 99% [37,38]. A suspicion of cognitive impairment arises if the patients showed inability to recall any words or recall only one to two words with an abnormal clock drawing [25]. Those patients with a positive cognitive impairment should be evaluated with a more detailed neuroneuropsychological assessment [25].

Screening for depression

There is evidence for the presence of major depressive disorders in about 10% to 15% of the geriatric population [39]. The Geriatric Depression Scale and the Hamilton Depression Scale are the most accepted and widely used depression assessment tools [40]. However, a two-question assessment tool has been developed by asking the patient about; his recent feeling of interest or pleasure and any feelings of depression, sadness or hopelessness [41,42]. This brief tool has shown good specificity (65%) and sensitivity (95%) compared to other clinical diagnostic tools [41]. Moreover, using a detailed coding for each answer has improved sensitivity to be as high as 83% [43].

Assessment of sensory functions

Sensory impairment is ranked as the most common problem among the geriatric population [25]. The prevalence of hearing impairment is about 30 to 45 in patients aged 75 years and above, while visual impairment affects about 50 of the same age group [25,44,45].

Screening for hearing impairment

There no strong evidence in the literature that supports the certainty of detecting mild hearing loss (25 to 40 dB); accordingly, the first appropriate step is to identify significant impairment through a simple questioning technique [25]. This single-question technique has shown a specificity of 70 as compared to audiometry [44]. Additional recommended examinations include; the whispered voice test,

otoscopic examination and audio scope examination [29]. Among other examinations, the whispered voice test is the easiest with the possibility for use at the level of primary care [46]. Moreover, the test has good sensitivity; up to 90% and specificity up to 75% [46].

Screening for visual impairment

The Snellen eye chart is the standard for visual impairment screening [25,47]. It has outperformed screening questionnaires [25,47]. Although this test can detect refractive errors, it will not be adequate for early detection of cataract, glaucoma and macular degeneration [25,47]. Patients with a high risk of these conditions are recommended to have a periodic examination by an ophthalmologist [29].

Assessment of nutritional status

The geriatric group aged 65 to 75 years is usually overweight and undernutrition is not a very common condition among this group [48]. There are main four components to be assessed in terms of the nutritional status of geriatric patients [29]. These components include; 1) nutritional history using a nutritional health checklist, 2) food intake record over a 24-hour duration, 3) physical examination for any signs of nutritional deficiency or overnutrition, and 4) laboratory tests whenever appropriate [29]. One of the most common and simplest screening tools in geriatric population is the Nutritional Health Checklist (Table 2) [29].

Statement	Yes
I have an illness or condition that made me change the kind or amount of food I eat.	2
I eat fewer than two meals per day.	3
I eat few fruits, vegetables, or milk products.	2
I have three or more drinks of beer, liquor, or wine almost every day.	2
I have tooth or mouth problems that make it hard for me to eat.	2
I don't always have enough money to buy the food I need.	4
I eat alone most of the time.	1
I take three or more different prescription or over-the-counter drugs per day.	1
Without wanting to, I have lost or gained 10 lb in the past six months.	2
I am not always physically able to shop, cook, or feed myself.	2

Table 2: *The Nutritional Health Checklist in geriatric population* [29].*

*Scoring: 0 to 2 = You have good nutrition. Recheck your nutritional score in six months; 3 to 5 = You are at moderate nutritional risk, and you should see what you can do to improve your eating habits and lifestyle. Recheck your nutritional score in three months; 6 or more = You are at high nutritional risk, and you should bring this checklist with you the next time you see your physician, dietitian, or other qualified health care professional. Talk with any of these professionals about the problems you may have. Ask for help to improve your nutritional status. * Adapted with permission from The clinical and cost-effectiveness of medical nutrition therapies: evidence and estimates of potential medical savings from the use of the selected nutritional intervention. June 1996. Summary report prepared for the Nutrition Screening Initiative, a project of the American Academy of Family Physicians, the American Dietetic Association, and the National Council on the Aging, Inc.*

Assessment of the balance and risk of falling

Balance disorders and falling are major threats to the functional independence of patients aged 65 years and older [25]. Every year, one of three people in this age group will have a falling, and one in ten people will have a major injury [25]. The resulting moving limitation of these injuries along with the fear of falling will increase the risk of future falling by three times [25]. For that, the global assessment of falling risk should be always a part of the geriatric assessment [25].

An assessment tool for falling risk has been developed based on the American and British Geriatrics Societies guidelines and health care providers' input [49]. Moreover, gait speed can be a significant indicator with a speed of less than 0.8 m/s should be an alarming sign for further assessment [25]. This speed can be an indicator of higher risk of future falls, mobility impairment and frailty [25].

Screening for other disorders

About 50% of geriatrics aged 60 years or more have at least one non-communicable disease (NCDs) and about one-third of them have at least two [50]. These diseases include diabetes mellitus, cardiovascular disorders and cancers [50]. These diseases, among adults aged 60 years or more, are responsible for about 80% of the health care burden [50]. Moreover, they are responsible for about 45% of mortality among geriatrics aged 70 years or above [50]. Sazlina has provided a summary of NCDs and the level of evidence supporting their screening (Table 3) [50].

Condition	Recommendations	*Evidence/recommendation grade
High blood pressure hypertension	Screening is recommended at regular clinic visits in view of strong evidence on the benefit of treatment in individuals with hypertension	Level I/A
Type 2 diabetes	Screening of asymptomatic older people with underlying hypertension or other cardiovascular disease is recommended at any point of contact	Level II-1/B
Dyslipidaemia	It is recommended that older people with one or less CAD risk factor (other than age) for annual screening	Level I/A
	Those with multiple risk factors (hypertension, diabetes and cigarette smoking) to be screened at any point of clinical contact	
Tobacco use	Older people should be screened for tobacco use at any point of clinical contact	Level I/A
	Brief counseling for smoking cessation and pharmacotherapy should be provided to those who use tobacco	
Colorectal cancer	FOBT beginning at 50 years of age and to be continued until 75 years every 2 years is recommended	Level I/A
Breast cancer	Older women up to 69 years of age with no risk factor for breast cancer would be benefitted from biennial screening mammography, but they must be fully informed about the benefits and harms of screening	Level I/B
Lung cancer	Insufficient evidence to recommend for or against screening for lung cancer with low dose chest CT screening in high-risk individuals (based on age and smoking status)	Level I/I
Prostate cancer	It is not recommended to screen older men for prostate cancer	Level I/D
	If patients request for the test, they must be fully counseled about the benefits and harms from screening	
Cervical cancer	Women aged 65 years and more with three successive negative smears in the past 10 years is not recommended for cervical cancer screening	Level III/D

Table 3: *Screening recommendations for NCDs among geriatric population [50].*

**Based on US Preventive Service Task Force; Evidence level: Level I = Evidence obtained from systematic reviews of randomised controlled trials or at least one properly randomised controlled trial; Level II-1 = Evidence obtained from well-designed controlled trials without; Level III = Opinion of respected authorities, based on clinical experience; descriptive studies and case reports, or reports of expert committees. Grade of recommendation: A = Recommends the service. There is high certainty that the net benefit is substantial; B = Recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial; D = recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits; I = The current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.*

Conclusion

Comprehensive screening for geriatric health is a must to detect and prevent any impending dangerous health conditions. This can be achieved by a combination of different screening tools to assess functional ability, cognitive abilities, mental health, nutritional status, balance and risk of falling, sensory functions, and non-communicable disease (NCDs).

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Conflicts of Interest

No conflicts related to this work.

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