A New Tool for Rapid Geriatric Assessment in the Elderly

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ABSTRACT:

Background: Geriatric assessment (GA) in the elderly is vitally important for determining the optimal management for patients and the appropriate source of its financing. The search for a novel and compact tool stemmed from the clumsiness and complexity of the traditional instruments in scoring and interpretation.

Objectives: To assess the design, application and validity and reliability of a new tool for rapid geriatric assessment in the elderly.

Methods: We measured activities of daily living (ADL) scores using the new tool compared with a well-known (Barthel) index in a population study of 90 elderly subjects (20 males and 70 females) in four long-term care departments of a governmental geriatric center, representing a spectrum of subjects (independent, frail, mentally exhausted, and totally dependent).

Results: There was a good correlation between the two tools, as demonstrated by the correlation curve. The new test was found to be reliable and valid according to the Cronbach and Pearson indexes. Importantly, it took a mean of 5 minutes to complete compared to 20–30 minutes with the traditional tests. The interpretation is simple, unlike the complexity of the other tools.

Conclusions: The new tool for rapid geriatric assessment is able to evaluate the same and additional parameters measured by traditional tests and does so in much less time with equivalent validity and reliability.

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KEY WORDS: geriatric assessment (GA), comprehensive geriatric assessment (CGA), functional status assessment (FSA), functional independence measure (FIM), elderly

Comprehensive geriatric assessment is defined by the 1987 National Institutes of Health consensus conference on CGA as "a multidisciplinary evaluation in which the multiple problems of older persons are uncovered, described, and explained, if possible, and in which resources and strengths of the person are catalogued, need for services assessed, and a coordinated care plan developed to focus on interventions on the person's problems" [1]. Accordingly, CGA extends beyond

the traditional medical evaluation of older persons to include functional, mental, psychiatric and social status assessments. The process is a lengthy one, often taking hours, and is usually not possible to undertake, or necessary, as a routine assessment. CGA has been applied in inpatient units [2], in transitional units [3] and in ambulatory settings [4]. Interventions were not standardized but generally included the selection of frail elders at high risk for physical or functional decline or admission to hospital or nursing home.

CGA, or its abbreviation Geriatric Assessment, a multidisciplinary intervention used in distinctly geriatric settings, is now being applied or advocated in more limited forms in all clinical contexts in which older patients receive care. Although the effectiveness of traditional CGA is not obvious in outpatient primary care settings, recent studies have demonstrated that practices that include some elements of CGA – such as periodic evaluation of cognitive screening and enquiries about falls – are associated with increased patient survival [5], improved care [6], and decreased mortality, hospital readmissions and nursing home admissions [7]. Based on the overall success of CGA and in view of the growing numbers of older patients seen by primary care physicians in outpatient settings, numerous professional societies (e.g., American College of Physicians and American Geriatric Society) have recommended that primary care practices adopt some elements of CGA – from simple probes to more specific procedures and instruments such as short versions of Functional Status Assessment and cognitive screens [8].

The first published FSA index for the elderly was the Activities of Daily Living Index introduced by Katz in 1963 [9]. This index is a dichotomous rating (dependent/independent) of six ADL functions: bathing, dressing, feeding, transferring, toileting, and continence. The scale represents a natural progression in the loss of ADL capacities. The patient's performance in terms of the number of activities in which he or she is dependent is scored on a scale from 0 to 6, where 0 means independence and 6 means complete dependence in all the six functions. Scoring by means of the Katz FSA version has been criticized by Chen and Bryant and is no longer widely used [10].

In 1965, Mahoney and Barthel [11] extended the six basic ADL functions proposed by Katz to ten by differentiating

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CGA = comprehensive geriatric assessment

FSA = Functional Status Assessment
ADL = activities of daily living

between urinary and fecal incontinence and adding hygiene, walking, and climbing stairs. Each item is rated by a four-stage scale in terms of whether the patient can perform the task independently, with mild assistance, moderate assistance or is totally dependent on help, based on observation. The responses are scored 15, 10, 5, 0, respectively, for the "complicated" functions (i.e., walking, climbing stairs), while the other functions are graded on a two- or three-scale basis, yielding a maximum score of 5 or 10. The overall score is formed by adding the individual scores. The scores range from 0 (totally dependent) to 100 (totally independent), in steps of 5: 0–20 = total dependency, 25–60 = severe dependency, 65–90 = moderate dependency, and 95 = slight dependency. The Barthel index is widely accepted and validations of data are more extensive than those for many other ADL scales [12], but there has been criticism related to the scoring system and to the interpretation of the scores in the middle of the scale. Moreover, the scale is inherently restricted in that low levels of disability may not be detected: while a score of 100 indicates independence in all 10 specific areas, assistance may still be required with instrumental ADLS that are not included in the Barthel index.

The third and most widely used FSA instrument for the elderly is the Functional Independence Measure – developed by Granger [13] and based on the Barthel index and on the Uniform Data System [14] for medical rehabilitation – to measure disability and estimate payments for rehabilitative medicine. The FIM adds seven more ADL parameters to the six basic ones as well as five new communicative-cognitive items, totaling eighteen items for measuring physical and cognitive disability in terms of burden of care. It uses a 7-point rating scale and takes about 30 minutes to administer and score each patient. It has proven reliability and validity. The total score ranges from 18 to 126: 18–36 = totally dependent, 37–72 = needs considerable to moderate help, 73–90 = slight-to-moderate help, and > 90 = altogether independent.

The search for a novel and compact tool for a geriatric assessment tool derived from the complexity in scoring and interpretation using the traditional instruments. In this study we propose a new compact instrument for rapid geriatric assessment that is suitable for clinical use.

METHODS

THE PROPOSED INSTRUMENT

The new tool is based on the acronym INDEPENDENT, signifying the measured items [Table 1]. The six basic ADL items were shortened to five by incorporating "washing" into the category of "toileting," which is more representative of the activity. Five medical-neuropsychiatric functions and another nursing function (assistance by a family member or a caregiver) were added. Each function was assigned only

FIM = Functional Independence Measure

Table 1. INDEPENDENT Functional Status Assessment

FUNCTION	0	0.5	1.0
Incontinence (Fec./Ur.)			
Nutrition, Nurture			
Dressing			
Eating			
Postural stability			
Excursion			
Neurologic deficit			
Dementia, Depression			
Eye, Ear			
Nursing assistance			
Toileting			
Total			

Each initial represents an ADL or medical function. 0 signifies full help, 0.5 partial help, 1 independent. Total score is 11 and signifies full independence, 5–10 frail, 0–5 dependent

three possible choices in order to reduce variance between examiners: "totally dependent," "needs help," or "totally independent," and the scores are 0, 0.5, and 1, respectively. A patient whose total score is 11 is totally independent. The test was first applied to 90 patients – 20 males (mean age 85 years, SD 7.73) and 70 females (mean age 83.76 years, SD 7.99) – from four long-term care departments in the governmental Rishon Geriatric Center during the routine periodic follow-up by the nursing staff after brief instruction. The study population comprised independent (n=22), frail (n=22), mentally exhausted (n=22), and totally dependent (n=24) patients who had been diagnosed previously by the traditional qualitative method based on a form consisting of functional items assessed semi-quantitatively. They were evaluated first by the Barthel test and then with the new instrument. Care was taken that the patients were tested when they were not sedated and not acutely ill.

RESULTS

The average scores of the Barthel Index and the proposed test are presented in Figure 1. They are superposed – almost identical, as evidenced by the good correlation between the two instruments ($R = 0.97$), as seen in the scatter plot in Figure 2. Reliability and validity (Cronbach and Pearson coefficients) were high. The internal consistency (Cronbach) was 0.96 on 10 items of the Barthel Index and 0.95 on 11 items of the new test. The validity was measured by correlating the scores of the two tools for each examinee and was 0.97. The interpretation is simple: 0–5 total score = totally dependent, 5–10 = frail, 10–11 = independent.

Figure 1. Functional status assessment average scores according to function, showing almost full superposition of the two scales, Barthel versus the new Barel-INDEPENDENT scoring scale, as evidenced by the high correlation coefficient, $R = 0.97$.
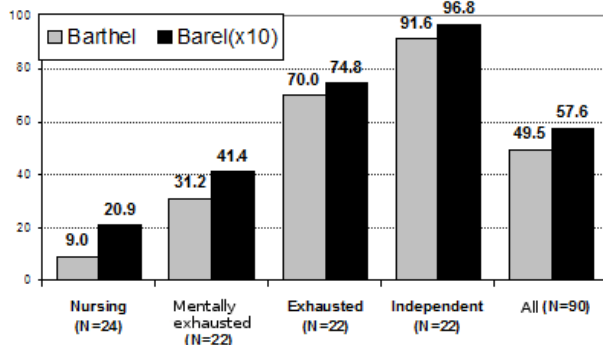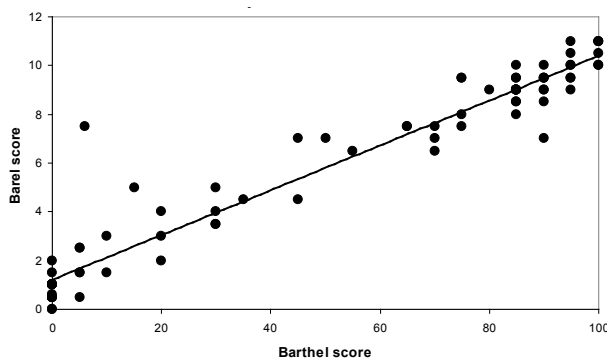

Figure 2. Scatter plot demonstrating the high correlation between the two functional status assessment rating scales, Barthel and the new INDEPENDENT-Barel rating scale

DISCUSSION

Unlike the traditional physical examination, GA involves a more comprehensive assessment of the patient's functional, cognitive, psychiatric and social status. With an evidence base developed over the last three decades, GA has been shown to improve functional status, quality of life and survival and to decrease hospital and nursing home admissions when applied appropriately. In view of the unfeasibility of CGA in primary care practice and the growing number of older patients seen by primary care physicians, it is recommended by professional societies that some elements of CGA be incorporated routinely into primary care practices [15]. Among the elements of CGA, FSA is considered the most comprehensive, the most practicable and the most efficient.

FSA in the elderly is vitally important for determining optimal management of patients and the appropriate source of its financing. The search for a novel and compact tool stemmed

GA = Geriatric Assessment

from the clumsiness and complexity of scoring and interpretation with the traditional instruments. Furthermore, FIM, the most widely used FSA instrument, was originally designed by Granger to measure disability and estimate payments in the rehabilitation setting, and it was introduced after 3 years of research by the Uniform Data System company which was founded expressly for running and managing this tool worldwide [13]. Using FIM outside this setting and with non-trained personnel leads to misuse and abuse [16].

The strength of the new tool lies in its simplicity, comprehensiveness, and capability for use outside the rehabilitation setting. It can be employed by the primary care physician as a supplement to the classical physical examination or by a member of the multidisciplinary medical staff after brief instruction, by simply assigning one of three scores to each letter-item of the acronym according to the patient's status.

INDEPENDENT is a new tool for rapid GA in the elderly. It is a short index that is portable, easy to administer and interpret, compact and user friendly, and can be applied to large numbers of patients for screening purposes. It is not intended to solve the complex issue of CGA in the elderly but rather to offer for the first time a comprehensive device to quantify the functional and relevant medical problems of the elderly. It is capable of determining appropriate patient placement and financing sources and can serve as a guideline for further investigations by more detailed analyses as well as for optimal patient management.

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