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A simple validated questionnaire predicted functional decline in community-dwelling older persons: prospective cohort studies

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Abstract

Objectives: To modify and validate in primary health care the Identification of Seniors At Risk (ISAR) screening questionnaire to identify older persons at increased risk of functional decline and to compare this strategy with risk stratification by age alone.

Study Design and Setting: Prospective development (n = 790) and validation cohorts (n = 2,573) of community-dwelling persons aged ≥70 years. Functional decline at 12 months was defined as an increase of at least one point on the modified Katz−activities of daily living index score compared with baseline or death.

Results: Three items were independently associated with functional decline: age (odds ratio [OR]: 1.06 per year; 95% confidence interval [CI]: 1.02, 1.10), dependence in instrumental activities of daily living (OR: 2.17; 95% CI: 1.46, 3.22), and impaired memory (OR: 2.22; 95% CI: 1.41, 3.51). The area under the receiver operating characteristics curve (AUC) range of the ISAR-primary care model was 0.67−0.70, and 40.6% was identified at increased risk. Validation yielded an AUC range of 0.63−0.64. Age ≥75 years alone yielded an AUC range of 0.56−0.57 and identified 55.4% at increased risk in the development cohort.

Conclusion: Although the ISAR−Primary Care (ISAR-PC) has moderate predictive value, application of the ISAR-PC is more efficient than selection based on age alone in identifying persons at increased risk of functional decline.

Keywords: Elderly; General practice; Functional decline; Screening tool; Longitudinal study; Self-reported outcome

1. Introduction

The occurrence of new disabilities is often called functional decline [1]. This comprises a decline in activities of daily living (ADL) or instrumental activities of daily living (IADL). Disabilities are associated with loss of independence [2], need for hospital and nursing home care [3], and mortality [4]. The annual incidence of (I)ADL disabilities ranged from 13% to 24% depending, among other things, on the applied definition [5,6]. Functional decline places a high burden on social and economic resources in aging societies.

Meta-analyses of preventive interventions, such as complex interventions based on comprehensive geriatric assessment, and multicomponent exercise programs in community-dwelling older persons demonstrate that functional decline can be postponed [7−10]. Identifying older persons, who may benefit from a preventive intervention, at increased risk is therefore an important first step [11]. Over the last decades, considerable effort has been put into the identification of frail older persons in primary care [12,13]. Different strategies exist for the identification of frail older persons. It can be based on self-assessment instruments for older persons [14,15], on the clinical judgment by the general practitioner (GP) [16] or on the routine health care data from the GPs' electronic medical record (EMR) [17].

From the literature, it appears that exclusively focusing on complex care for frail elderly may not be efficient, because older persons with no or only mild disabilities who are at increased risk of functional deterioration are the most likely to benefit from preventive interventions [11,18]. Extending preventive efforts toward somewhat younger people (70−75 years.) and a less frail (''prefrail'')

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What is new?

Key findings

- Identification of Seniors At Risk-Primary Care (ISAR-PC) is a validated, generic, and easy-to-apply screening instrument to identify persons at increased risk of functional decline in the open population. It comprises three items (age, dependence in instrumental activities of daily living, and impaired memory).

What this adds to what was known?

- Over the last decades, considerable effort has been paid into the identification of older persons at risk of functional decline by self-reporting questionnaires in primary care. The ISAR-PC is easily applicable and thoroughly validated in general practice.

What is the implication and what should change now?

- In general practice, in a population <85 years of age, the ISAR-PC can be used as an efficient and validated method to identify persons at increased risk of functional decline and is more efficient than selection based on age alone.

population is therefore believed to increase the yield of comprehensive geriatric assessments and tailored interventions [7,10,11,19].

To identify older persons at increased risk of functional decline a self-reporting, generic, easy-to-apply, and validated instrument is needed. Several other well-known instruments have the ability to predict functional decline over time, such as the Sherbrooke Postal Questionnaire [20], Vulnerable Elders Survey [21], the Groningen Frailty Index [6], Tilburg Frailty Indicator [14], and the Survey of Health, Ageing and Retirement in Europe−operationalized frailty phenotype [22]. However, some screening tools require external validation in a larger population [6,20] or in a primary care setting [6,20,21].

The Identification of Seniors At Risk (ISAR) questionnaire is a self-report screening instrument that was validated to identify older persons at increased risk of functional decline who visit the emergency department (ED) [23]. The ISAR is short and easy to administer and can be completed by patients or informal caregivers. Because the original ISAR contains risk factors that are associated with functional decline in community-dwelling older persons [3,24], we hypothesized that the ISAR could also be usable in a primary health care setting.

In some European countries, it is policy in primary health care to conduct annual multidimensional assessments to all persons aged ≥75 years [25]. Selection by age is frequently used as a starting point for preventive interventions [10]. We hypothesized that the identification of older persons at increased risk of functional decline by a simple discriminative screening instrument is more efficient than based on age alone.

The aims of this study were therefore to (1) assess the predictive performance of the original ISAR questionnaire to detect older persons at increased risk of functional decline and further improve or modify the instrument where possible, (2) test a modified ISAR questionnaire in a validation cohort, and (3) compare the performance of the modified ISAR with risk stratification by age alone.

2. Methods

2.1. Design and setting of development and external validation cohorts

A prospective cohort study was conducted in seven general practices in the Netherlands. These practices had a mixed population in terms of sex, age, and socioeconomic status (SES) (Appendix A at www.jclinepi.com). Measurements of the development cohort began in October 2008, and the cohort was monitored for 12 months.

The modified ISAR was externally validated in another prospective cohort in 10 general practices in a northwestern region of the Netherlands. Measurements of the external validation cohort began in December 2010, and the cohort was monitored for 12 months.

2.2. Participants in development and external validation cohorts

All community-dwelling persons aged ≥70 years, registered in one of the participating general practices, were retrieved from the EMRs by their GP. Persons were excluded if they were terminally ill, were demented, did not understand Dutch, and planned to move or spend a long time abroad. Eligible persons received a letter from their GP with information about the study, along with a written informed consent form, a self-report questionnaire, and a prepaid envelope. They were invited to fill out the questionnaire themselves, and if they needed help, an informal caregiver was allowed to assist (this assistance was noted on the questionnaire). All participants were asked to provide written informed consent for data collection and participation in the study after receipt of the study information. Those persons unwilling to participate were asked to select one of three prestructured reasons on a reply card: too ill, not interested, or lack of time. They could also add their own comment. A postal reminder was sent after 3 weeks if no response was received. After 6 weeks, two attempts by phone were made to contact those who had failed to respond. The study was approved by the Medical Ethics Committee of the Academic Medical Center, University of Amsterdam (protocol ID MEC10/182).