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Identifying memory impairment and early dementia in primary care

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Abstract

Introduction: This study examined the operating characteristics of two-stage case finding to identify memory impairment and very mild dementia.

Methods: Primary care patients underwent two-stage testing and a subsequent diagnostic assessment to assess outcomes. Patients who screen positive for subjective cognitive decline on the Informant Questionnaire on Cognitive Decline in the Elderly undergo memory testing with the Free and Cued Selective Reminding Test with Immediate Recall. Outcomes were determined without access to these data. A split-half design with discovery and confirmatory samples was used.

Results: One hundred seventeen of 563 (21%) patients had dementia and 68 (12%) had memory impairment but not dementia. Operating characteristics were similar in the discovery and confirmatory samples. In the pooled sample, combined, patients with memory impairment or dementia were identified with good sensitivity (72%) and high specificity (90%). Differences in ethnicity, educational level, or age ($\leq$75, >75) did not affect classification accuracy.

Discussion: Two-stage screening facilitates the efficient identification of older adults with memory impairment or dementia.

Keywords: Alzheimer's disease; Two-stage screening; Memory; Free and Cued Selective Reminding Test; Informant Questionnaire for Cognitive Decline in the Elderly; Cognition

1. Introduction

Policy recommendations for routine cognitive assessment in older adults are variable and evolving. The U.S. Preventive Services Task Force did not recommend cognitive screening or case finding in asymptomatic patients because the aggregate benefits have not been demonstrated to outweigh the aggregate costs and risks [1]. The Centers for Medicare and Medicaid Services recommended cognitive assessment as part of the Annual Wellness Visit for older adults but did not specify the testing approach [2]. In response, the Alzheimer's Association recommended assessment tools that include brief tests of memory and cognition as well as informant interviews [3]. In the context of a screening or case-finding program, patients who screen positive for cognitive impairment are referred for a more detailed evaluation at a subsequent primary care visit or to a clinician with expertise in dementia.

As part of the broad public health effort to reduce the burden of cognitive disorders of late life, many groups have assessed potential screening and case-finding tools in primary care or population settings including in person mental status and brief memory tests [4], interviews [5], brief cognitive batteries [6], informant questionnaires [7], and two-stage assessment strategies [8,9]. Using our two-stage screening strategy, eligible subjects receive a brief, highly sensitive initial screen. Those who screen positive are followed up with a second-stage test to increase specificity [10]. This strategy facilitates time-efficient screening at the time of a routine clinic visit [6]. One strategy worked well at distinguishing patients with dementia from those without dementia in two demographically different primary

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care clinics located in the Bronx, NY [8,9]. The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) [11] was administered in the first stage to identify patients who then undergo second-stage memory testing with the picture version of the Free and Cued Selective Reminding Test with Immediate Recall (pFCSRT + IR), which controls the learning conditions to identify memory impairment and dementia [12]. The combined strategy provided high specificity (91%) and good sensitivity (77%) in identifying very mild dementia among black and white patients [8] and among younger and less-educated black and Latino patients [9].

Given the increased interest in identifying patients in predementia stages of Alzheimer's disease (AD) [13,14], we sought to determine how well the strategy distinguished patients with no memory impairment (NMI) from patients with memory impairment but no dementia (MIND) and patients with dementia (DEM) at cross-section. Evidence is accumulating that in persons free of dementia, subjective cognitive decline (SCD) is predictive of future cognitive decline and incident AD dementia [15]. In the first stage, informants complete the short form of the IQCODE [11]. Persons who have SCD undergo second-stage memory testing with the pFCSRT + IR [12]. We selected an IQCODE cut score based on previous studies to optimize sensitivity. The free recall cut score on the pFCSRT + IR to identify memory impairment was selected to balance sensitivity and specificity.

Herein, we combined the two Bronx-based primary care cohorts to create a heterogeneous patient sample with memory impairment or very early dementia that was demographically and educationally diverse and large enough to test the generalizability of the proposed screening strategy. We used a split-half design and derived empirical cut scores in a discovery sample and applied them to a confirmatory sample. Secondary goals were to determine classification accuracy in patients with low versus high levels of education, for Latino and non-Latino blacks as well as white patients, and for patients younger or older than 75 years.

2. Methods

2.1. Overview

The same screening and case-finding methods were used in two primary care settings in Bronx, NY. The IQCODE and the pFCSRT + IR were administered to all patients and comprised the screening assessment. The purpose of this analysis was to identify cutoff scores on the two instruments in tandem to optimize diagnosis of dementia in future two-stage screening programs. The diagnostic battery that consisted of a comprehensive neuropsychological evaluation and informant interviews described previously [8,9] were administered at a second visit. Experienced bilingual examiners approached eligible patients at their scheduled appointment, recruited interested patients, obtained written consent, and conducted the evaluation at the patient's convenience, before or after their physician visit. Testing was supervised by the same neuropsychologist (E.G.). Without knowledge of the pFCSRT + IR or IQCODE results, two raters (E.G. and A.E.) independently reviewed scores from the diagnostic battery and informant responses to determine the presence versus absence of memory impairment and dementia.

2.2. Study participants

The study participants from two clinics associated with the Einstein College of Medicine, the Geriatrics Ambulatory Practice (GAP), an academic geriatrics practice, and from the Jacobi Adult Medicine Clinic (JAM). Eligible participants were aged 65 years or older, had adequate vision and hearing to complete the neuropsychological tests, and spoke English or Spanish. Each participant provided the name of a family member or friend who knew them for at least 5 years. GAP patients who scored below 19 on the Mini–Mental State Examination (MMSE) [16] were excluded as were JAM patients with a medical diagnosis of dementia at the baseline visit. Study participants gave informed consent using procedures approved by the institutional review boards at the Albert Einstein College of Medicine and Jacobi Medical Center.

2.3. "Gold-standard" diagnosis"

A consensus diagnosis for each participant was established by the neuropsychologist (E.G.) and geriatrician (A.E.) using *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) criteria for dementia [17] without input from the patient's primary care provider or knowledge of pFCSRT + IR performance or IQCODE responses. A report was generated for each patient containing informant's responses to the Clinical Dementia Rating (CDR) interview [18] augmented by their responses to the Alzheimer's Disease Cooperative Study Activities of Daily Living Scale [19] and the patient's tests scores from the diagnostic battery along with the 5th, 10th, and 50th percentile scores of the patients without dementia. Before the consensus conference, E.G. and A.E. reviewed the report, made an independent determination of the patient's diagnostic status as having NMI, MIND, or DEM. They also rated the patient's cognitive performance and activities of daily living using the CDR scale [18]. Disagreement on DSM-IV criteria or CDR box scores for any patient was resolved at the consensus conference.

2.4. Two-stage case finding

2.4.1. Stage 1: Assessment of cognitive decline

The IQCODE assesses 10-year change in memory and cognition as rated by a family member or friend [11]. It is one of the most widely used informant interviews [7,20].