48. Screening for Dementia

RECOMMENDATION

There is insufficient evidence to recommend for or against routine screening for dementia with standardized instruments in asymptomatic persons. Clinicians should remain alert for possible signs of declining cognitive function in older patients and evaluate mental status in patients who have problems performing daily activities (see ***Clinical Intervention***).

Burden of Suffering

Dementia is usually defined as global impairment of cognitive function that interferes with normal activities.[1,2] Although impaired short- and long-term memory are typical of dementia, deficits in other cognitive functions in addition to memory (e.g., abstract thinking, judgment, speech, coordination, planning or organization) are required for the diagnosis of dementia.[2,3] Alzheimer's disease accounts for most cases of dementia in North America (50–85%),[4,5] with an additional 10–20% attributed to vascular ("multi-infarct") dementia. The relative importance of vascular dementias is higher in populations where hypertension and stroke are more common (Asians, African Americans, persons over 85).[6–8] Other important causes of dementia include alcoholism, Parkinson's disease, metabolic disorders (vitamin B_{12} deficiency, hypothyroidism), central nervous system infections (e.g., HIV, neurosyphilis), intracranial lesions, and other illnesses.[4,9]

The prevalence of dementia increases steadily with age, roughly doubling every 5 years.[10] Studies of community-dwelling elderly in North America have reported dementia in 0.8–1.6% of persons 65–74 years old, 7–8% of persons 75–84 years old, and 18–32% of persons over 85.[5,8,11,12] The substantially higher prevalence reported from a community survey in East Boston[13]—19% for ages 75–84, 47% in those over 85—may reflect the inclusion of cases with milder impairment.[4] Estimates of the annual incidence of dementia in community-based studies are 0.6–1% for ages 65–74, 2–3% for ages 75–84, and 4–8% for ages 85 or older;[14,14a] many incident cases have only mild cognitive impairment, however. Dementia is common among institutionalized elderly[11] and is present in one half to two thirds

of the 1.3 million American nursing home residents.[13] Estimates of the number of Americans over 65 currently affected by Alzheimer's disease range from 1.4–4 million.[15,16] This number is projected to increase dramatically as the population of older (over 65) and very old (over 85) men and women increases in the U.S.[15]

Family history is consistently associated with an increased risk of Alzheimer's disease, with an estimated 3-fold higher risk among first-degree relatives.[17] Genetic risk factors for Alzheimer's disease have been identified[18,19] but are of uncertain value in clinical practice. A variety of other possible risk factors (e.g., lower educational level,[20] prior head trauma, family history of Down syndrome) and protective factors (e.g., smoking, estrogen replacement) for Alzheimer's disease have been reported, but the nature of each these associations remains uncertain.[4,5]

Alzheimer's disease progresses over a period of 2–20 years, causing increasing functional impairment and disability due to acute medical illnesses, depression, wandering, incontinence, adverse drug reactions, poor personal hygiene, and unintentional injuries (falls, burns, etc.).[21,22] Survival is reduced in patients with Alzheimer's disease[23] and in patients with any cognitive impairment;[24] mortality is strongly associated with severity of dementia. Dementia is estimated to account for about 120,000 deaths annually.[25] Care of the demented patient imposes an enormous psychosocial and economic burden on family and other caretakers. The annual costs of treating Alzheimer's disease alone, including medical and nursing costs and lost productivity, have been estimated to be $67 billion.[15]

Accuracy of Screening Tests

Dementia is easily recognized in its advanced stages, but numerous studies indicate that clinicians often overlook the early signs of dementia.[26–29a] The significance of early symptoms, whose onset is insidious, may be underestimated; patients and clinicians alike may mistakenly attribute changes to "normal aging."[29] Other patients, fearing a label of Alzheimer's disease, deliberately minimize their symptoms, and patients with more advanced dementia may not be aware of their deficits. Clinicians fail to detect an estimated 21% to 72% of patients with dementia, especially when the disease is early in its course.[26–29a] Conversely, clinicians may mistakenly attribute the symptoms of depression or drug toxicity in older subjects to irreversible dementia.

The routine physical examination and patient history is not sensitive for dementia, especially if family members are not present to corroborate patient self-report. Many clinicians include only a cursory examination of mental status as part of the routine history and physical. The inability to recall the correct date or place is reasonably specific (92–100%), but highly insensitive (15–53%) for dementia.[30,31] Neurologic findings, such as re-

lease signs, gait disorders, and impaired stereognosis, are usually late findings and are not sufficiently sensitive or specific to screen for dementia.[32]

The usual diagnostic standard for dementia consists of detailed assessment of mental status and careful investigation to rule out other causes of cognitive impairment. A variety of abbreviated instruments have been examined for their ability to screen for dementia in the outpatient setting.[33] The most widely studied of these instruments is the Mini-Mental State Examination (MMSE), a short, structured examination that takes 5–10 minutes to administer.[34] The MMSE contains 30 items and is reproducible using a standardized version.[35] Various studies suggest that an MMSE score of less than 24 of 30 has a reasonable sensitivity (80–90%) and specificity (80%) for discriminating between dementia cases and normal controls.[36] There are only limited data, however, on its performance as a screening test for early dementia among a representative population of outpatients. The positive predictive value (PPV) of MMSE for dementia depends on the definition of an abnormal score and the prevalence of dementia. Based on its performance in one community study,[37] a MMSE score of 20 or less has a PPV of only 48% when the prevalence of dementia is 10% (e.g., a population of 75–84-year-olds), but a much higher PPV (73%) when prevalence of dementia is 25% (e.g., age over 85).[31] The predictive value of intermediate MMSE scores (21–25) appears to be low (21–44%) for dementia in most populations.[31]

Recent data suggest that level of education and cultural differences have important effects on the range of MMSE scores in a given population. Among individuals with only 5–8 years of education versus those with college education, the cutpoints that identified the lowest 25% on MMSE were 23 and 29, respectively.[38] Spanish-speaking persons scored significantly lower than did English speakers on several MMSE items in one community-based study.[39] These data suggest that applying a uniform MMSE cutoff may miss significant changes among well-educated patients (false-negative result) and generate more frequent false-positive results among persons who are less educated or from different cultures.[40] Shorter screening instruments such as the Short Portable Mental Status Questionnaire[41] and the Clock Drawing Test[42] seem to be reasonably sensitive and specific for moderate to severe dementia, but they have not been adequately studied as screening tests in asymptomatic outpatients. Because they each examine a lesser range of cognitive function, they are not likely to be as sensitive as the MMSE or more comprehensive tests for detecting early dementia.

An alternative to screening for cognitive problems is to screen for functional impairment, which is a diagnostic criterion for dementia.[2] The Instrumental Activities of Daily Living (IADL) assesses level of function in eight common tasks.[43] When IADL was administered to a random sample of community-living persons over 65 (prevalence of dementia 2%), sub-

jects who reported difficulty using the telephone, using public transportation, taking medications, or handling finances were 12 times more likely to be diagnosed with dementia.[44] The Functional Activities Questionnaire, which scores function in 10 activities, also seems to be useful in measuring impairment and diagnosing dementia.[45,46] While these instruments generally rely on other informants (spouse, etc.), one recent study suggests that patients with mild dementia can reliably describe their functional status.[47] Because nondementing illnesses also interfere with daily activities, neither screen is specific for dementia.

The low predictive value of most screening tests for dementia raises the possibility that unselective screening may have adverse effects. Many asymptomatic patients with abnormal results on MMSE or other screening tests will not have dementia; these patients may be subjected to further tests (e.g., neuropsychological testing, blood tests, lumbar puncture, computed tomography [CT]) to confirm the diagnosis, rule out other reasons for altered mental status, and assign a cause of dementia. Comprehensive follow-up, although posing little risk to patients, will be time-consuming and expensive. If clinicians make a diagnosis based on screening alone, patients may be incorrectly diagnosed as having a progressive, incurable illness. Nonetheless, in the absence of screening, misdiagnosis of dementia is common in outpatient practice.[26] In one study in which general practice doctors administered a brief (10–15 minutes) standardized assessment to all patients over age 80, they revised their initial impression of cognitive function for 32 of 174 (18%) patients.[48] Interestingly, 16 patients initially diagnosed as "possibly demented" were reclassified as "not demented" after screening.

Effectiveness of Early Detection

There are several potential benefits of detecting dementia before patients are severely impaired: reversible causes of dementia may be identified and treated, treatments to slow the progression of disease can be instituted, measures can be taken to reduce the morbidity associated with dementia, and patients and their family members can anticipate and prepare for problems that will arise as dementia progresses.

Although early reports suggested that a substantial proportion of dementia was potentially reversible,[49] the number of patients who experience long-term improvements is relatively small. An overview of earlier studies concluded that only 11% of dementing illnesses improved in older patients, and only 3% resolved completely.[50] The most common correctable causes were drug intoxication, depression, and metabolic abnormalities. Among 36 cases of dementia evaluated in one community-based screening study, no cases of reversible dementia were found.[51] Among 85-year-old residents of Gothenburg, Sweden, only 3 of 147 cases of dementia were potentially reversible.[7]

Various treatments to improve cognitive function in Alzheimer patients have been examined in randomized clinical trials. Drugs that increase central levels of acetylcholine, such as tetrahydroaminoacridine (tacrine), have shown the most promise. Although several studies reported no benefit,[52,53] the three largest trials suggested a significant but modest benefit of tacrine in patients with mild to moderate dementia (average MMSE scores 16–19) over 6–30 weeks.[54–56] In one trial, the benefit of tacrine on cognitive test results was comparable to delaying disease progression by 5 months.[54] Improvements in overall clinical function have been small and inconsistent[54] but increase at higher doses.[55] The usefulness of tacrine is limited by high cost (over $100 per month) and frequent gastrointestinal side effects: up to 25% of patients taking lower doses, and two thirds of those on high doses, stopped therapy due to nausea, vomiting, or elevated liver enzymes.[53–56] Dihydroergotoxine (hydergine) improved some measures of cognitive function in previous trials, but does not produce important clinical benefits.[53,57] Other therapies under investigation include chelation therapy,[58] neuroprotective agents, and growth factors, but consistent evidence of clinical benefits is lacking.[5,53]

Early detection of vascular dementia may prompt better control of risk factors for cerebrovascular disease (treatment of hypertension, smoking cessation, aspirin therapy).[59] The effect of these measures on progression of vascular dementia, however, is not known. In a 2-year follow-up of 52 patients with multi-infarct dementia, smoking cessation was associated with improving cognitive function, but low blood pressure was associated with worsening function.[60] About one half of elderly demented patients manifest at least one coexisting illness, and treatment of associated disorders may improve function in patients with dementia.[61,62]

Identifying patients with early cognitive problems allows patients and their families to take measures to reduce the medical morbidity caused by progressive dementia. Patients are at increased risk of falls and automobile accidents as dementia progresses.[63] Effective interventions to prevent falls or accidents in patients with dementia have not been determined, however (see also Chapters 57 and 58). Comprehensive geriatric assessment has been shown to increase the number of older patients able to live independently at home,[64] but it is not possible to separate the benefits of cognitive assessment from other components (e.g., medical evaluation, social evaluation, drug management, follow-up).

An early diagnosis also permits care providers, especially family and friends of the patient, to benefit from support and self-help strategies in order to minimize the financial, emotional, and medicolegal pressures that will occur throughout the patient's illness. The psychiatric symptoms (depression, delirium or disruptive behavior) accompanying dementia can be anticipated and treated with psychotropic drugs and/or counseling.[65]

Decisions about durable power of attorney and advance directives can be made while the patient is still competent to participate. These benefits of early detection are based on clinical experience, but there are no data to prove that routine screening improves these outcomes.

An early diagnosis of dementia may also have adverse consequences: patients may have difficulty obtaining health or life insurance and may be excluded from retirement communities or long-term care facilities. Negative attitudes toward patients with dementia have been documented among professionals and lay people.[66]

Recommendations of Other Groups

There are no formal recommendations for routine screening for cognitive impairment or dementia. The Canadian Task Force on the Periodic Health Examination concluded that there was insufficient evidence to recommend for or against screening for asymptomatic cognitive impairment, but they advised that clinicians should remain alert for clues suggesting deteriorating cognitive function.[67] The American Academy of Family Physicians recommends that physicians include questions about functional status in the patient history of patients over 65, and remain alert for evidence of changes in cognitive function.[68] A National Institutes of Health consensus development conference concluded that no single test can diagnose dementia and urged clinicians to take the time necessary to conduct a thorough clinical evaluation.[1] Guidelines on the recognition and early assessment of dementia prepared by an expert panel convened by the Agency for Health Care Policy and Research (AHCPR), U.S. Public Health Service, are due to be released in 1996.

Discussion

Dementia is responsible for an enormous and growing burden on affected patients, their family members, and the clinicians who care for them. Early signs of dementia are often overlooked in routine encounters, and a variety of brief tests of mental status are available to help clinicians assess cognitive function more accurately in their patients. In the absence of more effective treatments to improve prognosis in patients with dementia, however, it is uncertain whether routine use of these instruments in all older patients will be of sufficient benefit to justify the inconvenience, costs, and possible harms of unselective screening. The predictive value of available screening tests is relatively low in the general population of asymptomatic older adults. Administering tests such as the MMSE to all older patients, and further evaluating those with positive results, will be time-consuming and expensive. Some patients may be incorrectly diagnosed with dementia on the basis of screening tests alone. Although there are many plausible

benefits of early detection, there are few studies demonstrating that routine screening actually reduces the medical, psychological, and social consequences of dementia. Other appropriate interventions (treating hypertension, correcting underlying illnesses, and taking precautions to prevent accidents) can be recommended for older patients with or without dementia.

Despite the limitations of unselective screening, clinicians can improve the timely diagnosis of dementia by being alert to suggestive signs and symptoms in their older patients (trouble with daily activities, concerns voiced by family members), and by using standardized instruments to evaluate cognitive function in those suspected of having dementia. A positive screening test is more meaningful in patients when there is prior reason to suspect dementia (due to the higher prevalence of disease), and normal mental status test results may provide reassurance. Screening tests, however, should not be used in isolation to diagnose dementia.

CLINICAL INTERVENTION

There is insufficient evidence to recommend for or against routine screening for dementia in asymptomatic elderly persons ("C" recommendation). Clinicians should periodically ask patients about their functional status at home and at work, and they should remain alert to changes in performance with age. When possible, information about daily activities should be solicited from family members or other persons. Brief tests such as the MMSE should be used to assess cognitive function in patients in whom the suspicion of dementia is raised by restrictions in daily activities, concerns of family members, or other evidence of worsening function (e.g., trouble with finances, medications, transportation). Possible effects of education and cultural differences should be considered when interpreting results of cognitive tests. The diagnosis of dementia should not be based on results of screening tests alone. Patients suspected of having dementia should be examined for other causes of changing mental status, including depression, delirium, medication effects, and coexisting medical illnesses.

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