RESEARCH AND PRACTICE IN ALZHEIMER'S DISEASE VOL 11, 2006 ©

A BRIEF ALZHEIMER'S SCREEN FOR CLINICAL PRACTICE

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The incidence of Alzheimer's disease (AD) increases with age (e.g., Gao, Hendrie, Hall, & Hui, 1998) and places an increasing burden on affected individual and their families in terms of declining quality of life. At the same time, general practitioners and specialists who provide healthcare for older adults often do not screen for dementia symptoms in this population, despite the epidemiological evidence of age-associated risk. While this practice is in agreement with recommendations provided by professional organizations (Knopman et al., 2001), other barriers to screening may exist. These barriers may include an impression that no dramatically effective therapies exist for AD, time constraints for patient evaluations, limited reimbursements for screening, along with assumptions that memory changes are normal with advanced age.

Brevity of dementia screening approaches directly impact evaluation time in clinical settings. Several groups have provided data showing good sensitivity and specificity of screening tools that are brief and easy to use (Borson, Scanlan, Watanabe, Tu, & Lessig, 2005). One potential screening procedure has been investigated using item response methods (Mendiondo, Ashford, Kryscio, & Schmitt, 2003) and is similar to other brief screening tools. This Brief AD Screen (BAS) incorporates items from the Mini-Mental State Exam (MMSE; Folstein, Folstein, & McHugh, 1975): episodic memory for three items, orientation to date, spelling of 'world' backwards, along with a brief semantic memory / language task that involves the retrieval or naming of animals over a 30 second interval. In our previous presentation of the BAS we were able to show good discrimination between normal

older adults and those with mild dementia using the following weighted function: 3.03recall + 0.67animals + 4.75date + 2.01spelling. Logistic analyses and receiver operating curves showed the BAS could discriminate between normal and mildly demented elderly (area under the curve; AUC = 0.99) in an existing dataset and in a memory clinic setting (AUC = 0.86) that included individuals with psychiatric diagnoses associated with their memory complaint. Based on the successful discrimination between AD and 'normal' samples, the present analyses sought to apply the BAS to individuals within the clinical classification of Mild Cognitive Impairment (MCI; Petersen et al., 1999).

METHODS

For the present analysis, we used our existing longitudinal cohort of normal elderly (Schmitt et al., 2000). This sample included 318 persons (63.52% female) who remained 'normal' over 8 years (±4.12) of follow up. Two additional groups were identified: (1) 178 persons (61.8% female) from our 'normal' cohort who met MCI criteria (Petersen et al., 1999) and (2) persons from this cohort and our memory disorders clinic who were diagnosed with mild AD (either initially normal or enrolled with AD; 50.16% female). The average age of each group was: 71.1(±7.63), normal; 75.2 (±8.0), MCI; and 73.8 (±9.83), mild AD. Educational levels were 16.3 (±2.22), 15.4 (±2.64), and 14.2 (±9.44) years, respectively.

BAS scores were derived for each participant in each group. Normal individuals had an average weighted BAS score of 33.60 (SEM=0.69) in contrast to scores of 30.62 (SEM=0.28) for the MCI group and 18.58 (SEM=0.32) for mild AD. Using the suggested BAS cut point of 26 (which had a 4% false negative in AD patients and 2% false positives for controls in the derivation sample; Mendiondo et al., 2003), only 10% of the MCI cases fell below this cutoff. This contrasts with 0.94% of normal cases and 84.24% of mildly demented individuals (Figure 1). The area under the curve (AUC) for the current analyses was 0.953 when comparing normals to mildly demented cases, 0.916 when comparing MCI versus patients, and 0.687 when comparing normals against MCI.

DISCUSSION

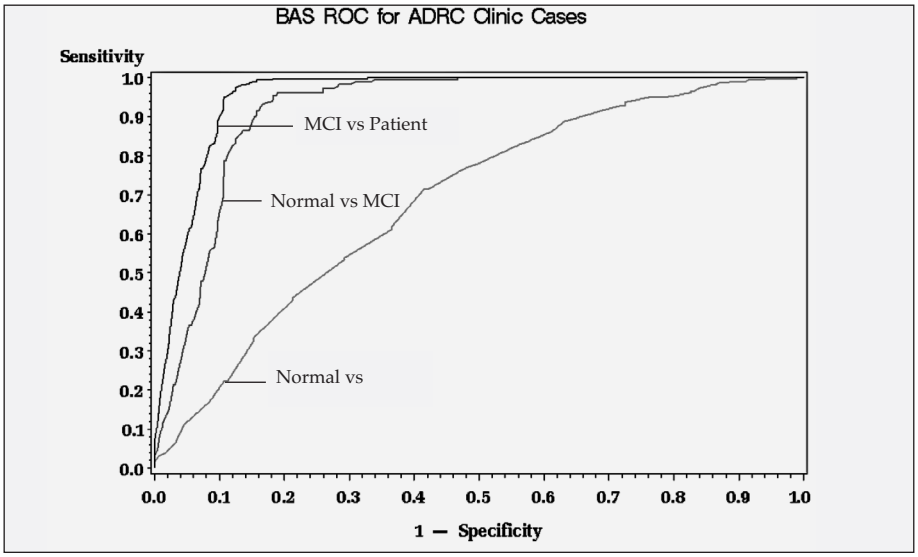
Screening for dementia across a wide range of medical settings is in its infancy, despite the recognized incidence and prevalence of dementia in older adults, partly due to resource limitations. Several brief and useful screening tests have been proposed (Borson et al., 2005) but require additional prospective studies in at risk elderly. This clearly is important for measures such as the BAS as it was derived from an existing dataset and

validated in a clinical setting with a high base rate of memory concerns in older adults. The usefulness of the BAS (or other screening tests) in a general family practice or geriatric clinic setting remains to be determined. Utility of any brief screen for dementia requires that attention be paid to base rate of dementia in the population that is being screened, along with considerations of cost-benefit analyses of the screening tool (e.g., Kraemer, 1992).

The BAS clearly discriminates between normal elderly and those with mild AD. However, the BAS is insensitive to the clinical presence of MCI. This may prove to be a challenge for all brief screening tools, even if one assumes that MCI is a prodromal state for AD (Dubois & Albert, 2004). The data reported here serve to demonstrate that items reflecting certain cognitive abilities that can discriminate between well defined clinical groups may not fare as well in persons who may develop a given disease at a later date. As a result, screening instruments for MCI might require greater emphasis on memory items, potentially limiting brevity. Obviously, studies of items that may be sensitive (and specific) to MCI symptoms could be developed and tested using similar item analysis approaches. However, once developed, screening approaches for MCI in the clinical setting should also be evaluated for their utility especially if treatments for MCI become available (cf., Petersen et al., 2005).

Figure 1

Receiver operating characteristic curves for the BAS showing discrimination between normal, MCI, and mild AD groups.



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