Validation of a motor screen for undiagnosed parkinsonism: The Baylor Functional Assessment Screen (BFAS)

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OBJECTIVE
To evaluate the sensitivity and specificity of a motor screening questionnaire designed to distinguish between individuals with and without parkinsonism. The ultimate goal is to develop a Parkinson’s disease (PD) screening instrument for use in community settings.

BACKGROUND
There is an unmet need to develop and validate highly sensitive and specific screening instruments targeting parkinsonian symptoms that would differentiate subjects with PD and other parkinsonian disorders from normal controls (Tanner et al, 1990). Rest tremor, difficulty walking, difficulty arising from a chair and walking slowly have been found to be highly specific (93.8-95.9%) but less sensitive (35.9-49.1%) for detecting parkinsonian motor symptoms (Ishihara et al 2005). Clinical diagnosis of PD is based on symptom recognition and examination. Therefore, to detect undiagnosed PD in a community setting, it is important to have a screening tool with high diagnostic sensitivity and specificity. Such a screening instrument will facilitate early diagnosis and institution of an appropriate treatment plan.

METHODS
The Baylor Functional Assessment Screen (BFAS) consists of twelve items, developed by movement disorder experts, that highlight key PD symptoms. Two samples of participants were recruited: normal community dwelling individuals and individuals diagnosed with parkinsonism by a movement disorder expert according to established diagnostic criteria (Jankovic 2008). The sensitivity and specificity of various cut points was then studied with receiver operator characteristic curves, and once an optimum cut point was determined, the positive and negative predictive power was evaluated.

PARTICIPANTS
The parkinsonism group (n=62), recruited from the Baylor College of Medicine Parkinson’s Disease Center and Movement Disorders Clinic was 55.6% male with an average age of 66.9 (SD ± 11.85). All were suspected of having PD except 8 patients who had the following diagnoses: dementia with Lewy bodies, cortico-basal degeneration, progressive supranuclear palsy, and multiple system atrophy.

The control group (n=163) was recruited from caregivers who accompanied patients to clinic appointments and from participants at community health fairs. This group was predominantly female (66.1%) and younger than the patient group (M= 45.8, SD=16.4; t=9.3, p<0.01).

RESULTS
On average, the parkinsonism patients (N=62) endorsed 8.2 (SD=3.53) of the items, while the control group (N=163) endorsed 1.4 items (SD=1.76). This difference was statistically significant (t=14.47, p<0.001) after controlling for inequality of statistical variances. With both groups combined, the scales internal reliability was excellent (Cronbachs alpha=0.88) with no indication that omitting any one item would improve this value.

To determine an optimum cut point, receiver operator characteristic curve analyses were undertaken. The overall area under the curve was significant (AUC=0.96, SE=0.01, p<0.001) indicating that the scale had excellent discriminant power. Evaluating the curve combined with clinical judgment suggested an optimum cut point of 4, which was used for the classification analyses below.

REFERENCES
• Jankovic J. Parkinson’s disease: clinical features and diagnosis. J Neurol Neurosurg Psychiatry 2008;79:368-376