Journal Club presentation by Nalaka Gooneratne, MD

Feasibility, Reliability, and Validity of a Smartphone Based Application for the Assessment of Cognitive Function in the Elderly


I Background

- There has been growing interest in the potential use of smartphone-based interventions for screening medical conditions in older adult populations.

II Goals of the study and why important

- Develop a new cognitive assessment tool using mobile device technology
- Assess remote testing feasibility

III Methods review

- Validation study of smartphone app for cognitive function
- Intervention: None
- Comparison or control: Validated paper-based cognitive tests
- Outcomes chosen: correlation with Mini-mental status exam, measures of processing speed/attention, naming/verbal fluency tasks, memory task, test-retest reliability
- Study population: 57 subjects from the Louisiana Aging Brain Study, MMSE>25
- Color-shape test (not used previously)
- Retest reliability in 11 (of 57) who kept their smartphones

IV Results

- 63.8 attempts on the task and answered correctly on 96.8% of the attempts
- Correlated with global cognition (MMSE, r =0.515, p=0.00004)
- Correlated with processing speed/attention
- No correlation with naming/fluency and memory
- Test-retest reliability of 0.73, p=0.02
- Suggests feasibility and reliability of using a smartphone-based assessment of cognition

V Reviewers Critique

- Study does not determine if this tool can be used in patients with MCI or dementia; minimal clinical utility otherwise.
- Biostatistical analysis very limited: no ROC, controlling for clustering by subject
- The high correct answer rate (96.8%) suggests ceiling effects
- Limited subject demographic information

VI Summary for practice implications

- Increasing likelihood of mobile device-based cognitive screening tools
- Should be evaluated using critical review methodology for “diagnostic tests”