Detecting Mild Cognitive Impairment Using the MoCA Clock Drawing Subtest

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METHODS

Subjects were administered the digital Clock Drawing Test (dCDT). Three variants of M-Clock scores were calculated using dCDT measurements of clock circle (ellipse, circle closure), numbers (all present, no repeats, no sequence error, in correct quadrant) and hands (distance from center, pointing to numbers, hand ratios), using 3 hand ratio thresholds: hour hand clearly shorter (CS; HH/MH <=0.85), equal (EQ, HH/MH=1.0) and any (ratio not considered). All groups were well-educated, with reported education attainment of at least some college.

RESULTS

FHS-Y & FHS-O were not differentiated by any of the 3 M-Clock score variations, suggesting that healthy people perform similarly across the lifespan. All three variations differentiated healthy from clinical groups, and aMCI from AD (p=.001): CS: FHS-Y (2.6±0.6)= FHS-O (2.5±0.6) > aMCI (2.1±0.8) > AD (1.4±0.9); EQ: FHS-Y (2.7±0.6)= FHS-O (2.6±0.6) > aMCI (2.27±0.8) > AD (1.5±0.9); ANY: FHS-Y (2.7±0.5) = FHS-O (2.8±0.5) > aMCI (2.42±0.8) > AD (1.6±1.0). MoCA scores based on circle and numbers criteria alone differentiated AD from other groups (p=.001), and did not further differentiate groups.

CONCLUSIONS

The clock drawing test is useful for detecting cognitive impairment in young and old age. Measurement of cognitive processes underlying placement of the clock hands can differentiate aMCI from AD. Hand ratios of Any Length differentiate groups and reduce potential scoring variability secondary to hand length judgments.

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