Automated tests of attention and information processing as an alternative to the Paced Auditory Serial Addition Test (PASAT) in clinical trials in multiple sclerosis

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K. Wesnes1, J. Swartz1, P.J. Jongen2
1Brackit, Goring-on-Thames, United Kingdom; 2Research, MS4 Research Institute, Nijmegen, The Netherlands

keith.wesnes@brackitglobal.com

BACKGROUND

MSFC
• The Multiple Sclerosis Functional Composite (MSFC) is a standardised instrument developed for clinical trials in Multiple Sclerosis (MS) by a Task Force on Clinical Outcomes Assessment appointed by the National Multiple Sclerosis Society’s Advisory Committee on Clinical Trials of New Agents in Multiple Sclerosis.
• It was the consensus of the task force that important clinical dimensions not emphasized in existing rating scales, e.g. cognition, should be measured.
• The MSFC was designed to fulfill three criteria:
  1. It should be multidimensional to reflect the varied clinical expression of MS across patients and over time.
  2. The dimensions should change relatively independently over time.
  3. One component should be a measure of cognitive function.
• The Paced Auditory Serial Addition Test (PASAT) was selected as the cognitive test.

PASAT & CDR SYSTEM ATTENTION TESTS
• The PASAT has been repeatedly found to have poor psychometric properties, e.g.: ‘Limitations of the MSFC include practice effects with the PASAT … Future research should be directed … at replacing the PASAT by a cognition test that has better measurement characteristics’ (Polman & Rudick, 2010).
• The CDR System Attention tests are brief (7 minutes), do not show training effects and are highly sensitive to treatment effects.
• The objective of this paper is to determine whether the CDR System Attention tests would be a suitable replacement for the PASAT.

CDR SYSTEM ATTENTION TESTS

Responses gathered by button box, simple and easy to use by volunteers and patients, allowing precise and highly sensitive assessments.

TASKS
• Simple Reaction Time – 2 min
• Choice Reaction Time – 2 min
• Digit Vigilance – 3 min

VALIDATED FACTOR SCORES
• Power of Attention
  » The ability to focus attention and process information
• Continuity of Attention
  » The ability to sustain attention (vigilance)

METHODS
• The CDR System was part of the evaluations in COBRA
  » A sub-study the FLAIR Study.
  » 24-month, prospective, multi-centre, observational Phase IV
  » 43 RRMS patients treated with INFb-1a (Avonex ®) administered IM once a week.
  » Mean age 38.8 years
  » Mean disease duration 6 years
  » Mean time since diagnosis 3.3 years
  » Annualised relapse rate over last 24 months 1.2

CONCLUSIONS
• Information processing speed is a core deficit in MS (Benedict & Zivadnov, 2011).
• PASAT shows large training effects and over 25% of patients show ceiling effects
• The CDR System has an excellent track record in over 65 peer reviewed papers for detecting cognition enhancement in various clinical conditions including Alzheimer’s disease, Dementia with Lewy Bodies, Parkinson’s dementia, ADHD, narcolepsy and epilepsy.
• The present data make a firm case for replacing the PASAT with the CDR System attention tests in the MSFC.

REFERENCES


Supported by funding from Brackit.